



I S C A A C A D E M Y

I N S P I R A T I O N F O R L I F E

SPRING 2020

KNOWLEDGE BOOKLET

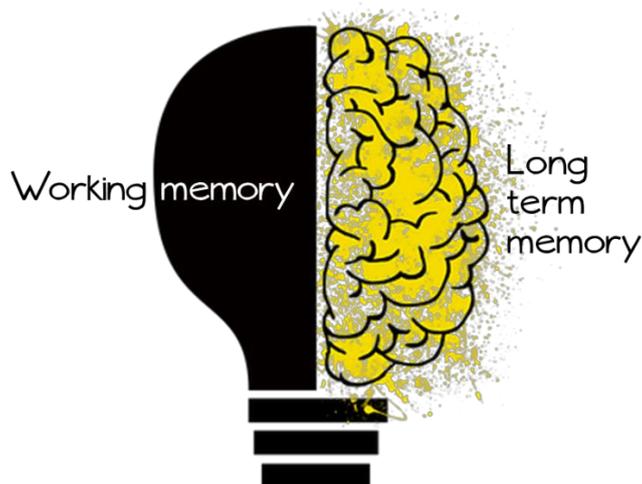
YEAR 11

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WHAT IS A KNOWLEDGE ORGANISER?

Your mind is split into two parts: the working-memory and the long-term memory. Everybody's working-memory is limited, and can very easily become overwhelmed and this is known as overload. Your long-term memory, on the other hand, is effectively a limitless storehouse for information.



You can support your working memory by storing key facts and processes in your long-term memory. These facts and processes can then be retrieved to stop your working memory becoming overloaded:

Let's look at an example, the basic number fact: $7 \times 8 = 56$

If you can instantly recall that $7 \times 8 = 56$, your working memory has more space to think about a more difficult problem, like 37×8 . The answer of 56 comes effortlessly, and you can focus on 30×8 , then add the product to the 56 in your head.

If you do not know that $7 \times 8 = 56$ straight away, you are more likely to become confused and frustrated. Being able to very quickly recall key facts is a way of hacking your working memory, making thinking about difficult stuff much easier.

This booklet contains knowledge organisers for all of your subjects for the Autumn term. Each knowledge organiser has the key information, which needs to be memorised to top up your long-term memory in order to help you master your subject and be successful in lessons. You will be expected to follow the homework schedule on page 4.

HOW TO USE YOUR KNOWLEDGE ORGANISER

Challenge yourself

Which will you choose?



Look Cover Write Check

Look at your knowledge organiser, Cover a section of it, Write out the content you have just covered from memory and Check you have recalled it correctly



Mindmaps

Place the key word/concept in the middle. Go wild with colourful, flowing shapes that link the key definitions and concepts.



Revision Clock

Draw a clock and add the topic in the middle. Then, break it down into 10 minute sections. Add notes in each segment. Cover the clock and recite all the information out loud.



Mnemonics

Creating mnemonics is a great way for remembering groups or lists of words. For example, to remember the order of planets in the solar system:

My **V**ery **E**xcited **M**other **J**ust **S**erved **U**S
Nachos



Flash Cards

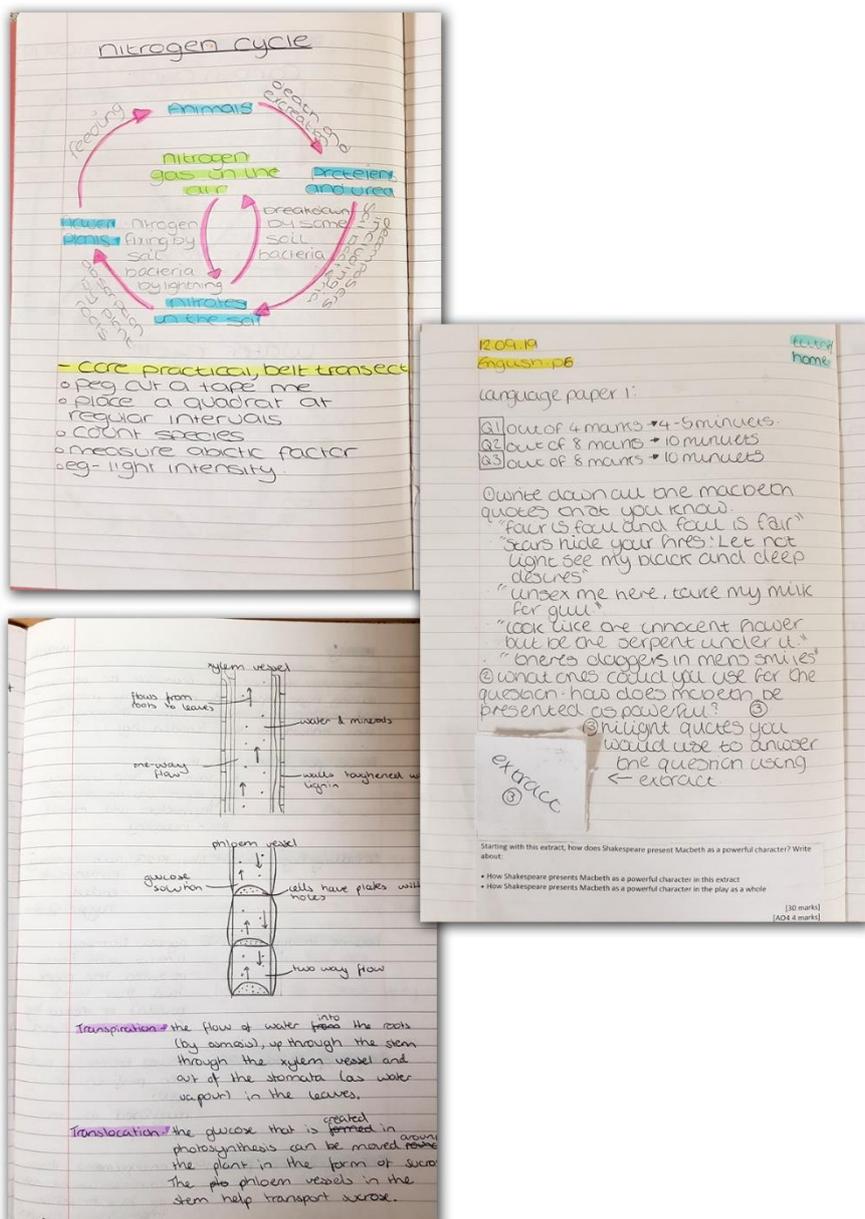
Write down the word/term on one side and a definition/explanation on the other side. Once you have notes written in your own words and summarised – move onto testing yourself quickly.

EXPECTATIONS OF YOU

1. Check the schedule on the next page to see which knowledge organisers you should use each day for your homework
2. Complete **one full page for each subject** on the schedule in your knowledge book **every day**
3. Use your knowledge organiser after you have finished to **mark and correct** your own work
4. **Sign your self-check sheet at the end of each week** after you have finished your full page each day
5. Get your self-check sheet **signed by your tutor** during your knowledge organiser tutor time session

T	on Time
A	Accurate
N	Neat
C	Complete

Homework should be **TANC**. Below is an example of homework that would meet the expected standard. If it does, your tutor will sign your log on the morning you are working in silence on your knowledge organiser.



YOUR SCHEDULE

Day	Subject	Subject
Monday	Numeracy – online	Literacy - online
Tuesday	Science	Option A
Wednesday	Option B	Option C
Thursday	Maths	Science
Friday	English	RE

Every Monday you will have Numeracy and Literacy homework. This will not be using your knowledge organiser, numeracy will be using SPARX and literacy will be using Doodle, both of which are online. Your English and Maths teachers will set these tasks.

Below are the option subjects you are currently studying:

Option A	Option B	Option C
Music Spanish Geography History Drama Resistant Materials	Art Catering Geography History Drama French	PE History Futsal Art Computer Science Textiles

Week commencing	Self Check	Tutor Sign	Week commencing	Self Check	Tutor Sign
13/1/2020			24/2/2020		
20/1/2020			2/3/2020		
27/1/2020			9/3/2020		
3/2/2020			16/3/2020		
10/2/2020			23/3/2020		

You will notice on each knowledge organiser that there are green and blue edged boxes with text in. Text in a green edged box is key vocabulary you need to learn and writing in a blue edged box are the key concepts/knowledge you will need to learn.

Key Vocabulary will be written in a green edged box like this.

Key concepts/ideas will be written in a blue edged box like this

Contextual Timeline

- 19th century = Industrial Revolution
- 1834 – Poor Law was introduced
- 1843 – The novel was written



The Isca Way: use these sentences, in whichever order, as a *guide* to help organise your thinking in the exam:

The writer establishes / uses / creates _____ to ...

This suggests / conveys / portrays...

The word / image / phrase "----" has connotations of...

At a deeper level...

Perhaps...Possibly...Metaphorically...

----becomes a symbol

for...Symbolically...

Priestley is challenging...Advocating...

...Is trying to change...

The audience thinks...Feels...Is made to understand...Wonders whether...Is left questioning...

'A Christmas Carol' – Charles Dickens

Characters:

Scrooge – A selfish business man who transforms into a charitable philanthropist.

Fred – Scrooge's nephew whose party invitation he declines

Jacob Marley – Scrooge's dead partner who returns as a ghost to warn Scrooge to change his ways.

Bob Cratchitt – Scrooge's clerk who doesn't have much money. He loves his family and is shown to be happy and morally upright.

Tiny Tim – Bob's ill son whose story plays a part in inspiring Scrooge's transformation.

Mrs Cratchitt – Bob's wife

The Ghost of Christmas Past – A strange combination of young and old, wearing white robes and looking like a candle.

The Ghost of Christmas Present – A portly, jovial gentleman surrounded by a warm glow. He brings joy to the neediest.

The Ghost of Christmas Yet To Come – A robed and hooded spirit who confronts Scrooge with his own tombstone.

Fezziwig – Scrooge's ex-employer

Belle – A woman who Scrooge was in love with; she left him due to his greed.

Fan – Scrooge's sister



Important Quotations:

"Hard and sharp as flint"

"As solitary as an oyster"

"I wear the chain I forged in life"

"He could not hide the light"

"Are there no prisons...are there no workhouses..."

"I'm not the man I was. I'm not the man I must have been"

"Beneath a ragged sheet, there lay a something covered up"

"Glowing"

"Ogre of the family"

"As good as gold"

"It is not my business"

"Mankind was my business"

"I don't know anything. I'm quite a baby."

"Another idol has displaced me... a golden one"

"Show me no more!"

"The mention of his name cast a dark shadow"

"They are Man's. This boy is Ignorance. This girl is Want. Beware for I see that written which is Doom."

"Yellow... wolfish"

The story:

Ebenezer Scrooge lives a cold and selfish life. He is visited by ghosts, who show him why he needs to change his ways. By the end of the novella – he redeems himself.

Themes:

- Social responsibility
- Social Class
- Society
- Wealth
- Family
- Love
- Redemption
- Supernatural
- Ignorance and Want
- Christmas
- Education

Dickens

Society

Enlightenment

Redemption

Parsimonious

Misanthropic

Benevolent

Victorian

Cyclical

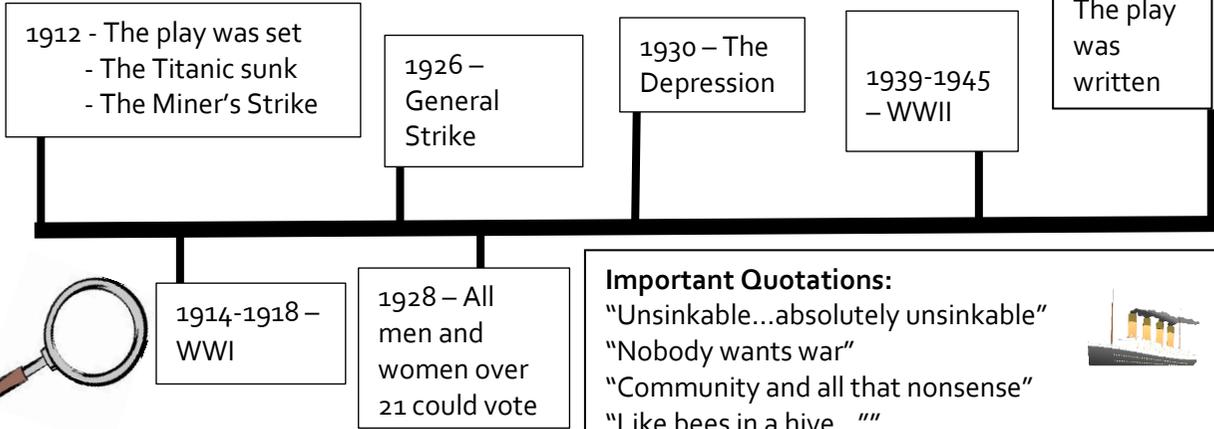
Solitary

Apparition



Introducing Your Idea
The beginning of a text Initially... Instantly...
As the text develops Over the course of the text... Plausibly... Perhaps... Evidently...
What stands out? Interestingly... Of importance here is... This idea is accentuated... This is further emphasised... This is reinforced... This is juxtaposed against...
What else could it mean? In addition... It is worth considering... At a deeper level...
The ending of the text Consequently... Towards the end of the text... Ultimately...

'An Inspector Calls' – J.B. Priestley



Characters:
Mr Arthur Birling: A wealthy businessman, capitalist
Mrs Sybil Birling: his wife and social superior
Sheila Birling: their young daughter (younger generation)
Eric Birling: their son (younger generation)
Mr. Gerald Croft: engaged to Sheila, son of Lady Croft and Sir Croft
Inspector Goole: socialist
Eva Smith / Daisy Renton: a young working-class woman

Important Quotations:

"Unsinkable...absolutely unsinkable"
 "Nobody wants war"
 "Community and all that nonsense"
 "Like bees in a hive..."
 "I accept no blame for it at all"
 "Now look at the pair of them – the famous younger generation who know it all"
 "If men will not learn that lesson, when they will be taught it in fire and blood and anguish."
 "The point is, you don't seem to have learnt anything."
 "There are millions and millions and millions of Eva Smiths and John Smiths..."
 "Cold"
 "But these girls aren't cheap labour – they're people"
 "Girls of that class"
 "We are all to blame"
 "You're not the kind of father a chap could go to when he's in trouble"
 "It's better to ask for the earth than to take it."



Important Stage Directions:

"The lighting should be pink and intimate...then becomes brighter and harder"
 "The sharp ring of the front door bell"
 "An impression of massiveness, solidity and purposefulness"
 "Cutting in"
 "He moves nearer a light"
 "With a little crv...runs out"



The story:
 A police inspector interrupts the Birling family's celebration of the engagement of Sheila and Gerald. The story unravels to show each of the family's involvement with the death of a young working girl, Eva Smith.

- Key concepts**
- Social responsibility
 - Social Class
 - Young and Old Generation
 - Gender
 - Society
 - Wealth
 - Family
 - Love

- Priestley**
Birling
Responsibility
Socialism
Capitalism
Welfare State
Socialism
Capitalism
Conscience
Omniscient
Microcosm
Cyclical
Patriarchal
Society
Redemption
Remorseful

The Isca Way: use these sentences, in whichever order, as a *guide* to help organise your thinking in the exam:

- The writer establishes / uses / creates ____ to ...
- This suggests / conveys / portrays...
- The word / image / phrase "----" has connotations of...
- At a deeper level... Perhaps...Possibly...Metaphorically...
- ----becomes a symbol for...Symbolically...
- Priestley is challenging...Advocating... ..Is trying to change.
- The audience thinks...Feels...Is made to understand...
Wonders whether...Is left questioning...



GCSE English Language Paper 1: Explorations in creative reading and writing

Question 1

List 4 things...in a given section. Write in full sentences.

X4

Question 2 = LANGUAGE

The writer presents ___ as ___ by using _____.

“Evidence”

Use the Isca Way

X3

Question 3 = STRUCTURE

- In the beginning the writer focuses on...
- The first lines establishes...
- The paragraph/sentence foreshadows...
- The writer establishes...
- The viewpoint/ perspective...
- The focus shifts to/focus narrows to...
- In the second half...
- The idea is further emphasised when...
- The tone changes when...
- Concludes with...
- The last line interests the reader because...
- The juxtaposition of...

X3

Question 5 = WRITING

Creative writing based on an image or title

Remember to plan!

Ingredients for Fantastic writing:

1. Ambitious Vocabulary
2. Structure
3. Punctuation
4. Language Features
5. Sentences

Question 4 = LANGUAGE and STRUCTURE

Agree/disagree with the statement

I agree / disagree that...

Use the Isca Way

Therefore / consequently / subsequently I agree / disagree...

X3

Introduce your idea

THEN

Get the marks

The beginning of a text

Initially...
Instantly...
As the text develops
Over the course of the text...
Plausibly...
Perhaps...
Evidently...
What stands out?
Interestingly...
Of importance here is...
This idea is accentuated...
This is further emphasised...
This is reinforced...
This is juxtaposed against...
What else could it mean?
In addition...
It is worth considering...
At a deeper level...
The ending of the text
Consequently...
Towards the end of the text...
Ultimately...

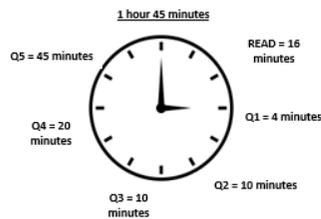
The Isca Way

Use these words and phrases in whichever order to analyse and respond to the writer's methods: language, structure, character, symbol, theme...
You can use the phrases in whichever order.
You do not have to use each one in every paragraph:

- the writer uses/establishes...by...
- this suggests / conveys / depicts / portrays...
- the word / image / phrase “---” has connotations of...
- at a deeper level / this seems to be a metaphor for...
- This becomes a symbol for...
- The writer is ... challenging / delivering a message about / advocating...
- The reader / audience...

Key vocabulary:

- Tone
- Connotations
- Establishes
- Suggests
- Conveys
- Portrays
- Evokes
- Shifts
- Viewpoint
- Perspective
- Furthermore
- Emphasised



Writer's methods:

- Simile – comparison using like or as
- Metaphor – comparison saying one thing is another
- Personification – giving inanimate objects human qualities
- Juxtaposition – two things with contrasting effects placed close to each other
- Cyclical – a repeated idea / word (at the beginning and end of a text/extract)
- Imagery – creates a picture in the reader's head
- Foreshadowing – a hint or indication of something to come
- Focus shift – the focus of the writing changes
- Adjectives – describing words
- Verbs – action or state
- Adverbs – describes how the verb is done

GCSE English Language Paper 2: Writers' viewpoints and Perspectives

Question 1

List 4 things...in a given section. Write in full sentences.

X4

Question 2 = SUMMARISE the differences

Identify a difference: **In Source A...**

Evidence: **For example...**

Effect: **This suggests / this conveys / this demonstrates...**

Compare: **Whereas in Source B...**

X3

Question 3 = LANGUAGE

The writer presents ___ as ___ by using _____.
"Evidence"

The connotations of the word/image/phrase "-----" are...
At a deeper level

This makes the reader understand/ think/feel...

This links to...

X3

Question 5 = WRITING

Creative writing based on an image or title

Remember to plan!

Ingredients for Fantastic writing:

6. Ambitious Vocabulary
7. Structure
8. Punctuation
9. Language Features
10. Sentences

Question 4 = COMPARE the writers viewpoints

In Source A, the writer presents ___ as ___ by using _____.

Use the Isca Way

X3

Introduce your idea

THEN

Get the marks

The beginning of a text

Initially...

Instantly...

As the text develops

Over the course of the text...

Plausibly...

Perhaps...

Evidently...

What stands out?

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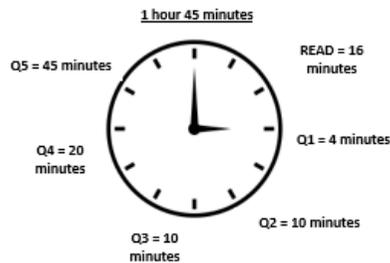
Ultimately...

The Isca Way

Use these words and phrases in whichever order to analyse and respond to the writer's methods: language, structure, character, symbol, theme...

You can use the phrases in whichever order. You do not have to use each one in every paragraph:

- the writer uses/establishes...by...
- this suggests / conveys / depicts / portrays...
- the word / image / phrase "---" has connotations of...
- at a deeper level / this seems to be a metaphor for...
- This becomes a symbol for...
- The writer is ... challenging / delivering a message about / advocating...
- The reader / audience...



Writer's methods:

Simile – comparison using like or as

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Adjectives – describing words

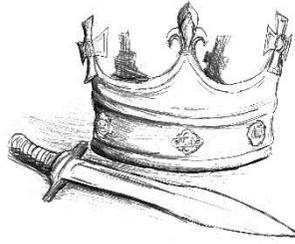
Verbs – action or state

Adverbs – describes how the verb is done

Key vocabulary:

Tone
 Connotations
 Establishes
 Suggests
 Conveys
 Portrays
 Evokes
 Shifts
 Viewpoint
 Perspective
 Furthermore
 Emphasised

'Macbeth' Knowledge Organiser



The beginning of a text

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- the word / image / phrase "..." has connotations of...
- at a deeper level / this seems to be a metaphor for...
- This becomes a symbol for...
- The writer is ... challenging / delivering a message about / advocating...
- The reader / audience...

1 The play opens as three witches plan a meeting with the brave Scottish nobleman Macbeth, who at that moment is fighting in a great battle. When the battle is over, Macbeth and his friend Banquo come across the witches who offer them three predictions: that Macbeth will become Thane of Cawdor and King of Scotland, and that Banquo's descendants will become kings.

Banquo laughs at the prophecies but Macbeth is excited, especially as soon after their meeting with the witches Macbeth is made Thane of Cawdor by King Duncan, in return for his bravery in the battle.

2. He writes to his wife, Lady Macbeth, who is as excited as he is. A messenger tells Lady Macbeth that King Duncan is on his way to their castle and she invokes evil spirits to help her do what must be done next. Macbeth is persuaded to kill Duncan by his wife and stabs him to death. No-one is quite sure who committed this murder; no-one feels safe. Macbeth is crowned king.

3. Macbeth is king - the second prediction from the witches has come true, but he starts to fear the third prediction (that Banquo's descendants will also be kings). Macbeth decides to have Banquo and his son killed, but the plan goes wrong. Banquo is killed but his son Fleance escapes. Macbeth sees Banquo's ghost at the feast and it seems that he is losing his mind as he hallucinates for the second time in the play. He seeks out the witches for more predictions. Their promises make him think that he is invincible.

4 He becomes more ruthless and orders the murder of the family of Macduff, a lord who seems to be challenging him. In England, forces begin to gather together to fight Macbeth.

5. Macbeth still thinks he is safe but one by one the witches' prophecies come true. Lady Macbeth is obsessed with guilt over the death of Duncan, becomes deranged and kills herself. A large army marches on Macbeth's castle. Macbeth is killed by Macduff, and his head is placed on the battlements of the castle.

Tyrant / tyranny
Ambition
Regicide
Malevolent
Corrupt / corruption
Usurper / usurped
Jacobean
Supernatural
Soliloquy
Equivocal / equivocator

Ambition
Evil
Order/disorder
Appearance & reality
Guilt
Loyalty/disloyalty
Kingship
The Supernatural
Manhood/courage
Fate vs Free will
Revenge



Key images (motifs)

Some ideas occur many times and have more significance:

Blood
Darkness and night
Sleep
Daggers
Animals, birds and insects
Heaven & Hell

Language Methods linked to Poetry	
Stanza (A verse)	A Stanza is a set amount of lines grouped by rhythmical pattern
Enjambment	The continuation of a sentence or phrase from one line to the next, without pause.
Personification	Giving inanimate objects human qualities to bring them to life
Alliteration	Repetition of one sound at the beginning of words.
Sibilance	Repetition of the S or SH sound at the beginning of words.
Half-rhyme	Words in which the consonants rhyme, rather than the vowels.
Simile	Comparing one thing to another using 'as' or 'like'
Metaphor	Describes a person or object by referring to something that is considered to have similar characteristics
Rhyming Couplets	Two lines following one another which rhyme
Rhythm	The arrangement of words to form a regular beat through a pattern of stresses.

'Unseen' means you have most likely have NEVER seen the poems in this section of the exam, ever... in your life... it does not mean they are invisible on the page!

You need to analyse the first Unseen Poem in response to the question.

What you need to write about in Section C:

Theme – the message the writer is conveying to their reader.

Language – write about how words and phrases are used to convey the writer's message. You should focus on the methods the writer uses.

Structure – how the poem has been 'built'. You could analyse how the rhythm; enjambment; stanzas; line number and length help to convey the key theme.

Comparing connectives

Likewise
Similarly
Equally
Likewise
As with

Contrasting connectives

However
Whereas
On the other hand
Alternatively
Although

Remember to write using The Isca Way and The Signpost Starters

The beginning of a text
Initially...
Instantly...

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Over the course of the text...
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Perhaps...
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At a deeper level...

The ending of the text
Consequently...
Towards the end of the text...
Ultimately...

27 - 1 In 'To a Daughter Leaving Home' how does the poet present the speaker's feelings about her daughter? [24 marks]

27 - 2 In both 'Poem for My Sister' and 'To a Daughter Leaving Home' the poets describe feelings about watching someone they are going to. What are the similarities and/or differences between the ways the poets present those feelings? [8 marks]

The second Unseen Poem response expects you to focus on just the effects of methods in **both** Unseen Poems.

General subject terminology used in poetry: simile, metaphor, personification, onomatopoeia, oxymoron, juxtaposition, emotive language, pathetic fallacy, alliteration, dissonance, imagery, symbolism, semantic field, tone, sensory imagery, synaesthesia, form, ambiguity, connotation, theme.

Advice from AQA:
"In preparing for the unseen poetry section of the examination students should experience a wide range of poetry in order to develop their ability to closely analyse unseen poems. They should be able to analyse and compare key features such as their content, theme, structure and use of language."

Types of number:

Odd – ends in 1, 3, 5, 7, 9

Even ends in 0, 2, 4, 6, 8 (is divisible by 2)

Factor – divides exactly into a number
eg 4 is a factor of 12

Multiple – in the times table of a number
eg 30 is a multiple of 5

Square number – can be written as a number multiplied by itself. 9 is a square number because it can be written as 3×3 or 3^2

Learn the first 15 square numbers!

1,4,9,16,25,36,49,64,81,100,121,144,169,196,225

Square Root ($\sqrt{\quad}$)- Undoes the square. $\sqrt{81}=9$

Cube Number- can be written as a number multiplied by itself three times. 64 is a cube number because it can be written $4 \times 4 \times 4$

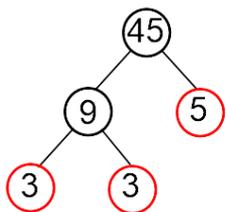
Learn the first 5 cube numbers 1, 8, 27, 64, 125

Cube Root ($\sqrt[3]{\quad}$). Undoes the cube. $\sqrt[3]{64} = 4$

Prime number - can only be divided by one and itself: 2, 3, 5, 7, 11, 13, 17... are prime.

REMEMBER: 2 is the only **even** prime number because it has only two factors; 1 and itself.

You will be asked to "express a number as a product of its prime factors." This means draw a factor tree.



Don't forget to write it as a PRODUCT (Multiply)

$3 \times 3 \times 5$

Metric units: You MUST learn these conversions

1 litre = 1000 ml 1cm = 10mm

1kg = 1000g 1m = 100cm

1000m = 1km

You may get asked to estimate using metric units.

Useful Reference points:

The height of a door is 2metres (200cm)

The weight of a bag of sugar is 1kg (1000g)

Can of drink 330ml . (0.33l)

ERROR INTERVALS

A number, n, rounded to 1 decimal place is 3.2 Write down the error interval

HINT ADD 0.05 and SUBTRACT 0.05

$3.15 \leq n < 3.25$

Error intervals are always written like this .Make sure the first < is underlined.

SETS

$\xi = \{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15\}$ ξ =Universal Set

A= { Multiples of 3} B= { odd numbers}

$A \cap B = \{3,6, 9, 12,15\}$ \cap means common to both (overlap)

$A \cup B = \{1,3,5, 6, 7, 9,11,12,13,15\}$ \cup means both united

Polygons

To work out what the angles in any shape add up to: **Subtract 2 from the number of sides and multiply by 180.** Eg Hexagon (6 sides)

So Subtract 2 and multiply by 180.

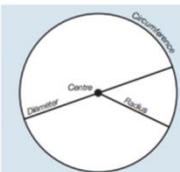
$4 \times 180 = 720^\circ$

Circles

Circumference = $\pi \times$ diameter, $C = \pi d$

Circumference of a circle equals π times diameter

Area of a circle = $\pi \times$ radius squared $A = \pi r^2$



Trigonometry

$\text{Sin} = \frac{O}{H}$

$\text{Cos} = \frac{A}{H}$

$\text{Tan} = \frac{O}{A}$

$S^O_H C^A_H T^O_A$

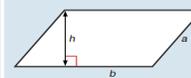
You MUST learn all of these formulae

Areas

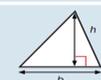
Rectangle = $l \times w$



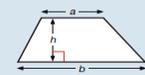
Parallelogram = $b \times h$



Triangle = $\frac{1}{2} b \times h$

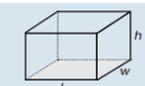


Trapezium = $\frac{1}{2} (a + b)h$

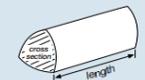


Volumes

Cuboid = $l \times w \times h$



Prism = area of cross section \times length



Cylinder = $\pi r^2 h$



Volume of pyramid = $\frac{1}{3} \times$ area of base \times h



Compound measures

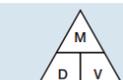
Speed

speed = $\frac{\text{distance}}{\text{time}}$



Density

density = $\frac{\text{mass}}{\text{volume}}$



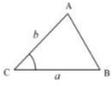
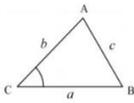
Pressure

pressure = $\frac{\text{force}}{\text{area}}$



YEAR 11 HIGHER

Sine, Cosine, Area of non-right angle triangles

Area of a triangle	Area = $\frac{1}{2}ab\sin C$ You can use this formula if you know two sides and the angle between them	
Sine Rule – calculating a side	$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$ You use this rule if you know one angle and the opposite side, and one angle and you want to work out the length of its opposite side	
Sine Rule – calculating an angle	$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$ You use this rule if you know one angle and the opposite side, and one side and you want to work out the size of its opposite angle	
Cosine Rule – calculating a side	$a^2 = b^2 + c^2 - 2bc\cos A$ You use this rule if you know two sides and the included angle and want to work out the missing side	
Cosine Rule – calculating an angle	$\cos A = \frac{b^2 + c^2 - a^2}{2bc}$ You use this rule if you know all three sides and want to work out an angle	

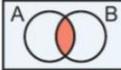
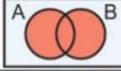
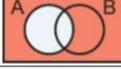
Transformation of Graphs

$y = -f(x)$	The graph of the reflection of the graph $y = f(x)$ in the x-axis
$y = f(-x)$	The graph of the reflection of the graph $y = f(x)$ in the y-axis
$y = -f(-x)$	The graph of the reflection of the graph $y = f(x)$ in the x-axis, and then in the y-axis Equivalent to a rotation 180° about the origin
$y = f(x) + a$	The graph of the translation of the graph $y = f(x)$ by $\begin{pmatrix} 0 \\ a \end{pmatrix}$
$y = f(x + a)$	The graph of the translation of the graph $y = f(x)$ by $\begin{pmatrix} -a \\ 0 \end{pmatrix}$
$y = af(x)$	The graph is a vertical stretch of the graph $y = f(x)$, with a scale factor a , parallel to the y-axis
$y = f(ax)$	The graph is a horizontal stretch of the graph $y = f(x)$, with a scale factor $\frac{1}{a}$ parallel to the x-axis

Area and Circumference of Circles and Sectors

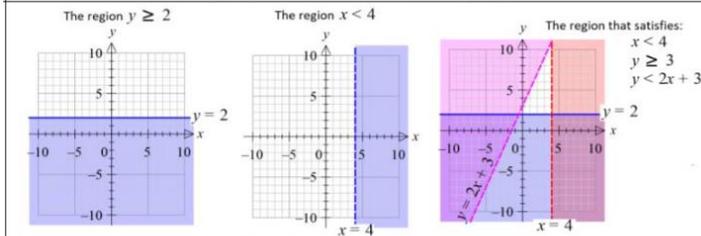
Circumference of a circle	$C = \pi d$	
Area of a circle	$A = \pi r^2$	
Arc length	$\frac{x}{360} \times 2\pi r$	
Area of a sector	$\frac{x}{360} \times \pi r^2$	
Perimeter of a sector	$\left(\frac{x}{360} \times 2\pi r\right) + 2r$	Arc length + 2 radii

Venn Diagrams

$\{ \}$	Curly brackets show a set of values	$5 \in \{ \text{odd numbers} \}$ means "5 is in the set of odd numbers"	
\in	Means "is an element of"		
Element	A "member" of a set		
ξ	Means the universal set	All the elements are being considered	
$A \cap B$	A intersection B	All elements in A AND B	
$A \cup B$	A union B	All the elements in A OR B OR both	
A'	Not A	All the elements NOT in A	
$P(A \cap B B)$	The probability of A And B given B		

Inequality regions

Points that satisfy an inequality can be represented on a graph

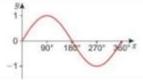
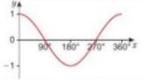
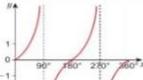


The unwanted sections are shaded

Dashed line for exclusive ($<$ or $>$)

Solid line for inclusive (\geq or \leq)

Trigonometry Graphs

Sine function	The sine graph repeats every 360° in both directions.	
Cosine function	The cosine graph repeats every 360° in both directions.	
Tangent function	The tangent graph repeats every 180° in both directions. The tangent graph is not defined for angles of the form $(90^\circ \pm 180n^\circ)$	

Fractions, Decimals and Percentages

Fraction	$\frac{1}{100}$	$\frac{1}{10}$	$\frac{1}{8}$	$\frac{1}{5}$	$\frac{1}{4}$	$\frac{1}{3}$	$\frac{1}{2}$	$\frac{2}{3}$	$\frac{3}{4}$
Decimal	0.01	0.1	0.125	0.2	0.25	0.3	0.5	0.6	0.75
Percentage	1%	10%	12.5%	20%	25%	33.3%	50%	66.6%	75%

Surds

Multiply surds	$\sqrt{a} \times \sqrt{a} = a$
Dividing	$\frac{\sqrt{a}}{\sqrt{b}} = \sqrt{\frac{a}{b}}$
Add and subtract surds	$\sqrt{a} + \sqrt{b}$ Cannot simplify But $\sqrt{a} + \sqrt{a} = 2\sqrt{a}$
Simplify	$\sqrt{50} = \sqrt{25 \times 2} = \sqrt{25} \times \sqrt{2} = 5 \times \sqrt{2} = 5\sqrt{2}$
Rationalise the denominator – Ensure there are no irrational numbers in the denominator	$\frac{1}{\sqrt{7}} = \frac{1}{\sqrt{7}} \times \frac{\sqrt{7}}{\sqrt{7}} = \frac{\sqrt{7}}{7}$ $\frac{1}{5 + \sqrt{2}} = \frac{1}{5 + \sqrt{2}} \times \frac{5 - \sqrt{2}}{5 - \sqrt{2}} = \frac{5 - \sqrt{2}}{3}$

Solving Quadratics

Solving Quadratics	Quadratics equations can be solved to find the roots The roots are where the quadratic graph intersects the x-axis There are three ways to solve quadratics: 1. Factorising 2. The Quadratic Formula 3. Completing the Square	
By Factorising	Writing the equation as the product of two linear expressions to find the solution	e.g. Solve $2x^2 - 3x - 2 = 0$ $(2x + 1)(x - 2) = 0$ So $2x + 1 = 0$ or $x - 2 = 0$ $x = -\frac{1}{2}$ or $x = 2$
By Quadratic Formula	A formula that can be used to work out the solutions to the quadratic equation $ax^2 + bx + c = 0$ $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$	e.g. Solve $x^2 + 4x + 2 = 0$ $a = 1, b = 4, c = 2$ $x = \frac{-4 \pm \sqrt{4^2 - 4 \times 1 \times 2}}{2 \times 1}$ Giving $x = -0.59$ and $x = -3.41$ as the solutions
By Completing the square	$x^2 + bx + c$ can be written in the form $\left(x + \frac{b}{2}\right)^2 - \left(\frac{b}{2}\right)^2 + c$	e.g. $x^2 + 6x + 7$ The completed square is $(x + 3)^2 - 3^2 + 7 = (x + 3)^2 - 2$

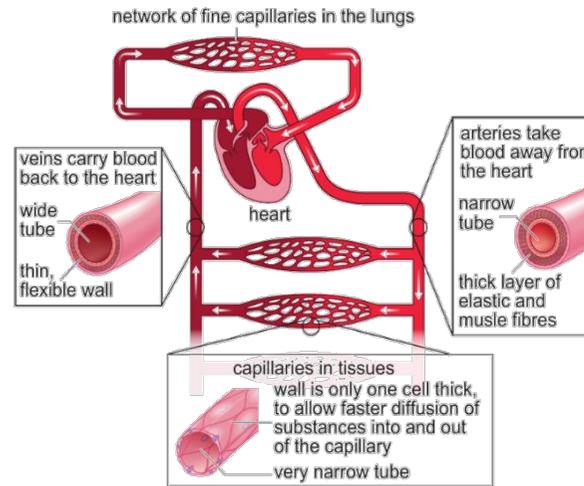
Exact Trig Values

θ	0°	30°	45°	60°	90°
Sin θ	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1
Cos θ	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0
Tan θ	0	$\frac{\sqrt{3}}{3}$	1	$\sqrt{3}$	

CB8

Unicellular organisms have a large surface area: volume ratio so they can rely on diffusion to transport substances in and out of the cell. However, multicellular organisms need transport systems, e.g. a circulatory system, due to a small surface area: volume ratio.

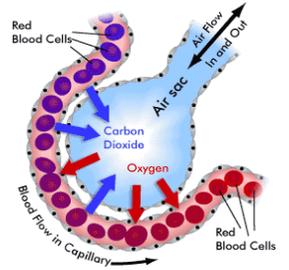
Plasma	Liquid carrying dissolved substances such as glucose, urea and carbon dioxide
Erythrocytes	Red blood cells; these contain haemoglobin to bind with oxygen so it can be carried to cells
Phagocytes	White blood cells; these engulf pathogens to reduce harm
Lymphocytes	White blood cells; these produce antibodies to match the pathogens antigen and destroy it
Platelets	These cell fragments have no nuclei and are responsible for clotting blood



Gaseous exchange between the alveoli and the blood.

Adaptions

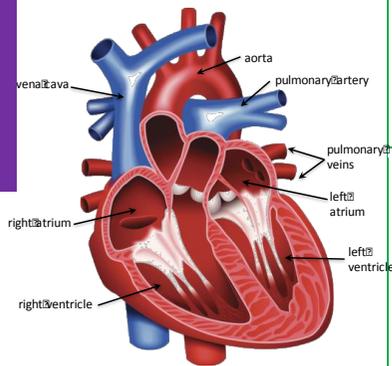
- Dense capillary network - maintains the concentration gradient
- Capillary walls are only one cell thick - shorter diffusion path
- Larger surface area - increases the rate of gas exchange



Respiration is an exothermic chemical reaction which releases energy.

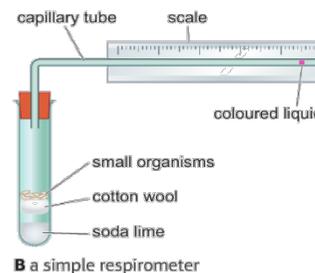
Aerobic	Anaerobic
Occurs continuously in all living cells to release energy for metabolic processes	Occurs during strenuous exercise when not enough oxygen is not available
Takes place in the mitochondria	Takes place in the cytoplasm
Glucose + oxygen → water + carbon dioxide	Glucose → Lactic acid

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Right ventricle	Pumps blood to the lungs where gas exchange takes place.
Left ventricle	Pumps blood around the rest of the body. Thicker cardiac muscle wall (large force)
Coronary arteries	Carry oxygenated blood to the cardiac muscle.
Heart valves	Prevent back flow of blood

Moving in (raw materials)	Moving out (waste)
Glucose – for respiration	Carbon dioxide – from aerobic respiration
Oxygen – for aerobic respiration	
Amino acids – building blocks of proteins	Urea – broken down proteins
Mineral ions	



B a simple respirometer

Core practical: Respirometer

Independent variable: temperature.

Dependant variable: distance travelled by the coloured liquid over time

Conclusion: As the temperature increases rate of respiration until it reaches an optimum, after which the rate decreases due to denaturing of the enzymes.

Cardiac output = stroke volume x heart rate

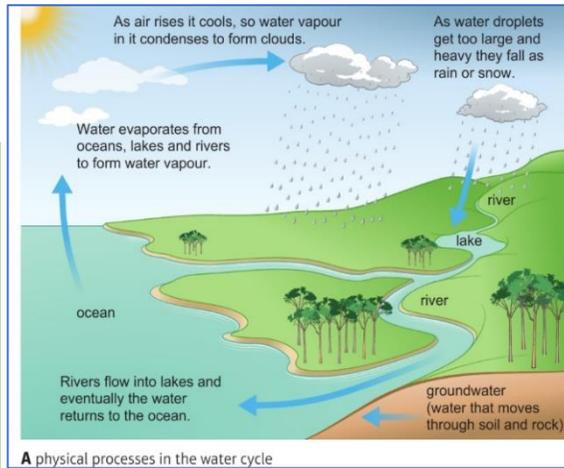
Heart rate = number of beats per minute

Stroke volume = volume of blood pumped per beat

Cardiac output = volume of blood pumped per minute

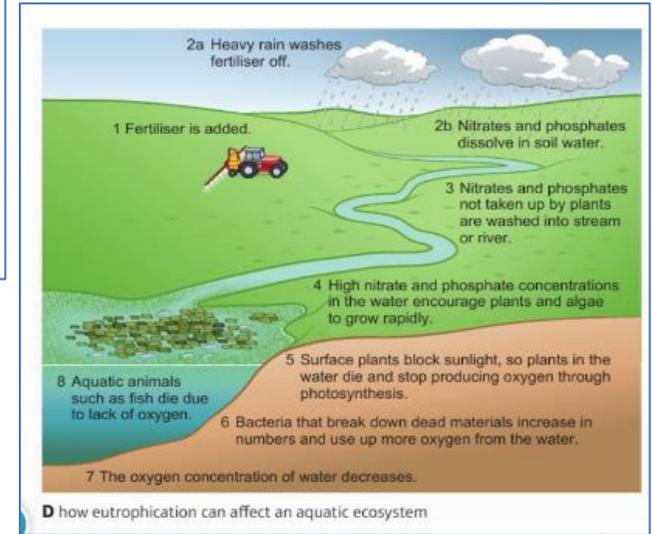
Interdependence is the interaction between organisms, and the effect of population sizes on a food web

Environment	The conditions surrounding a habitat; biotic or abiotic
Abiotic factor	Non-living factors that affect the distribution of organisms, e.g. light intensity, pH, pollution levels
Biotic factor	Living factors that affect the distribution of organisms, e.g. predators, food availability
Habitat	Place where organisms live, e.g. lake or woodland
Population	Individual species living in a habitat
Community	Populations of species living in a different habitat
Ecosystem	A community or habitat in which all the different populations of organisms live
Biodiversity	The variety of plant and animal species in an ecosystem
Parasitism	A relationship between a host and a parasite where only the parasite benefits, e.g. head lice and humans
Mutualism	A relationship where both organisms benefit from the relationship, e.g. oxpeckers and rhinos



A physical processes in the water cycle

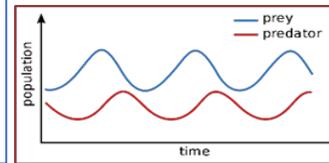
$$\text{population size} = \frac{\text{number of organisms in all quadrats}}{\text{total area of quadrats}} \times \frac{\text{total size of area where organism lives}}{\text{total area of quadrats}}$$



D how eutrophication can affect an aquatic ecosystem

Core Practical: Belt transect

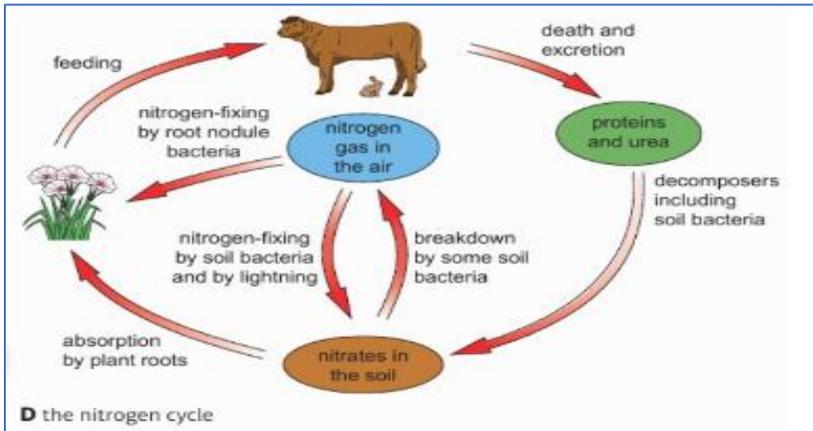
- Peg out a tape measure
- Place quadrat at regular intervals
- Count species
- Measure abiotic factor e.g. light intensity



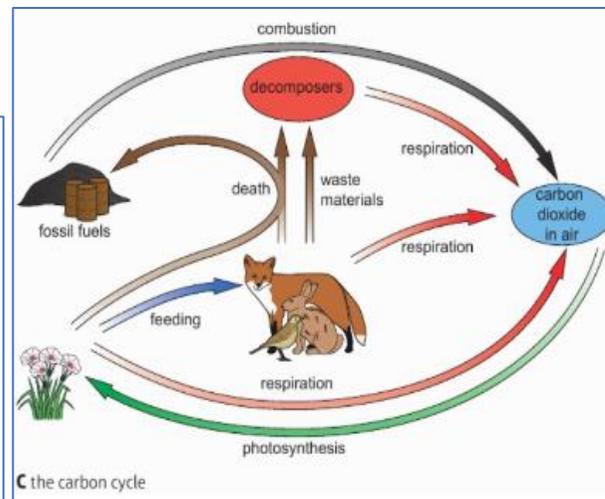
Population of prey increases so predators have more food and reproduce/raise young therefore predator population increases. Then predators eat more prey and prey population decreases

Preserving biodiversity: We can try and maintain biodiversity by:

- Reforestation
- Conserving endangered species



D the nitrogen cycle



C the carbon cycle

Fish farming: A large number of fish are farmed in a small area for human consumption

Introduction of non-indigenous species: Species not native to the area can affect food webs

Eutrophication: The addition of more nutrients (usually by fertiliser run-off) to an ecosystem than it normally has

Factors affecting biodiversity

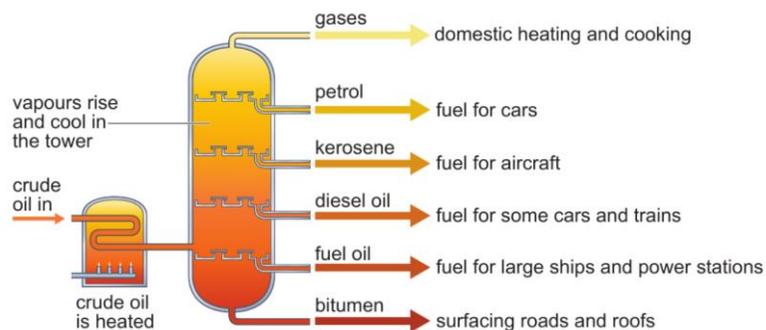
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Hydrocarbons: contain hydrogen and carbon atoms only

Crude oil: Complex mixture of hydrocarbons in chains and rings, a source of useful substances, a finite resource, can be separated into its more useful fractions using **fractional distillation**.

Fractional Distillation:

- The column is hottest at the top, coolest at the bottom.
- The vapours rise through the column and cool down.
- The vapours **condense** when they reach a part of the column that is cool enough, the liquid falls into a tray and is piped away.
- The vapours with the lowest boiling points do not condense at all and leave at the top as a mixture of gases.



Fraction	Number of atoms in molecules	Boiling point	Ease of ignition	Viscosity
gases	smallest (1-4 carbon atoms) 	lowest (<0 °C) 	easy to ignite 	lowest (flows most easily)
petrol				
kerosene				
diesel oil				
fuel oil				
bitumen				

► trends in the properties of the fractions leaving an oil fractionating column

As you go down the fractionating column, the number of carbon atoms in the chain increase, the boiling point and viscosity increase and the ease of ignition decreases.

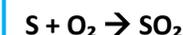
Complete combustion – sufficient amount of oxygen, produces carbon dioxide, water and energy.



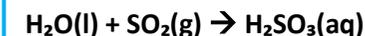
Incomplete combustion - insufficient amount of oxygen, sooty flame, produces less heat, carbon monoxide, carbon and water.



Sulfur dioxide: When hydrocarbon fuels are burnt they may contain impurities such as sulfur. This reacts with oxygen to form sulfur dioxide:



Sulfur dioxide dissolves in the water in clouds producing sulfurous acid:



The sulfurous acid is then oxidised to form sulfuric acid:



Oxides of nitrogen: High temperatures needed to cause oxygen and nitrogen to react to form nitrous oxide (NO₂).

Breaking down hydrocarbons: Cracking breaks down long chain (saturated/alkane) hydrocarbons into shorter chains (some of which will be unsaturated/alkenes) to meet demand. 650°C heat aluminium oxide catalyst.

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The hydrocarbon fractions are from the **alkane homologous series** – meaning they all have the same general formula (**C_nH_{2n+2}**), they differ by an increasing methyl group (CH₂). Alkanes have similar chemical properties and gradual variations in boiling points.

Acid rain – rain with a pH < 5.2, contains SO₂ and NO₂

Carbon monoxide is toxic. It combines with **haemoglobin** in red blood cells which means there is less oxygen in the blood = suffocation.

Saturated/alkane: Contain single C-C bonds only.

Unsaturated/alkene: Contains double carbon carbon bond C=C

Testing for oxygen: a glowing splint will relight

The greenhouse effect - the earth to get warmer because gases (methane, water vapour and CO₂) absorb heat energy radiated from the earth and release it = keeping the earth warm. **It is argued that human activity has caused climate change**

The early atmosphere:

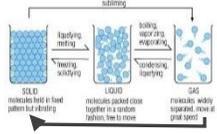
- little or no oxygen
- lots of CO₂
- water vapour
- small amounts of other gas. Then.....
- Water vapour condensed to form oceans (reduced the amount of CO₂ in the atmosphere as some dissolved in the oceans)
- Primitive plants grew, using up CO₂ (reducing levels further) and increasing the amount of oxygen



Solid: fixed shape, fixed volume, particles vibrating, strong forces between particles. High density (apart from water ice)

Liquid: fixed volume, no fixed shape, move around, weak forces between particles. Medium density

Gas: no fixed shape or volume, particles are spread out and moving fast and freely, no forces between particles. Low density



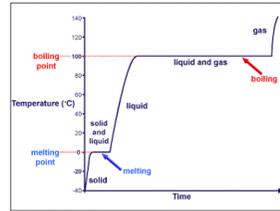
During heating, cooling, and changes of state:

- Mass is conserved.
- The changes are reversible (unlike most chemical changes)

Heating: Energy is transferred into a system.

Particles start vibrating more (solid), or moving around more (liquid/gas). The average kinetic energy increases, so the temperature increases.

Particles with enough energy to break their bonds change state. Temperature doesn't change until all particles have changed state.



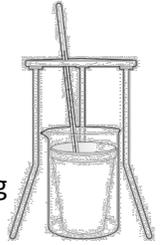
Specific heat capacity: The energy required to heat 1 kg of a substance by 1°C. Thermal energy change (J) = mass (kg) x specific heat capacity (J/kg °C) x temperature change (°C)

$$\Delta Q = m \times c \times \Delta \theta$$

Core Practical: Specific heat capacity of water

Method: Heat water for 5 minutes in an insulated container using an electrical heater. Measure the mass of water, change in temperature, and the energy transferred (joule meter)

Conclusion: Water has a high specific heat capacity. of 4200 J/kg°C, so it is often used to transfer thermal energy



Specific latent heat: The energy required to completely change the state of 1kg of a substance (the temperature doesn't change). The value depends on:

- The type of substance
- Whether it is boiling or melting

Thermal energy change (J) = mass (kg) x specific latent heat (J/kg)

$$\Delta Q = m \times L$$

Core Practical: temperature-time graph for melting ice

Method: Place crushed ice in a boiling tube with a thermometer. Use a beaker of water and Bunsen burner as a water bath to heat the ice and record the temperature at regular intervals

Absolute Zero: The temperature where particles stop moving, and the pressure of a gas becomes zero. It is -273°C, or 0 K (kelvin)

Celsius to kelvin: add 273

e.g. 100°C = 373 K

Kelvin to Celsius:

subtract 273

e.g. 100 K = -173 °C

Insulation: Reduces unwanted energy transfers:

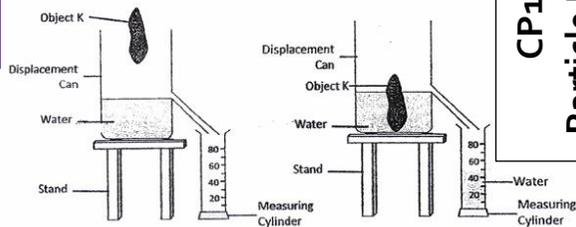
Conduction: Trapped air or a vacuum reduces energy transfer between colliding particles

Convection: Adding a lid, filling spaces with foam, or using a vacuum prevents particles transferring energy as they move

Radiation: Using shiny silver surfaces reduces energy transfer by radiation

$$\text{density} = \frac{\text{mass}}{\text{volume}} \quad \rho = \frac{m}{V}$$

Density: kg/m³ or g/cm³
Mass: kg or g
Volume: m³ or cm³

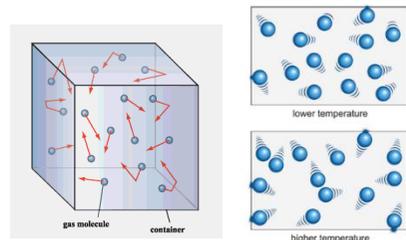


CP12 Particle Model

Gas in a sealed container (constant volume): As the temperature rises, the *average* kinetic energy of particles increases.

1. The temperature increases
2. Particles gain kinetic energy
3. Particles move faster, and collide with the walls more frequently
4. Faster and more frequent collisions cause a larger force to be exerted on the walls
5. The increasing total force over the entire surface of the container causes the pressure to increase too.

$$\text{Pressure (N/m}^2\text{)} = \text{Force (N)} / \text{Area (m}^2\text{)}$$



Core Practical: Density

Method

1. Weight an *irregular* object and record the mass
2. Fill the displacement can to the spout with water
3. Immerse the object in the water
4. Collect the displaced water in a measuring cylinder
5. Volume of displaced water = volume of object

Potential difference (voltage) is the energy transferred per unit charge passed and therefore the volt is a joule per coulomb

Electric current is the rate of flow of charge. The current in metals is a flow of electrons

In parallel circuits:

- the total current supplied is split between the components on different loops
- potential difference is the same across each loop
- the total resistance of the circuit is reduced as the current can follow multiple paths

In series circuits:

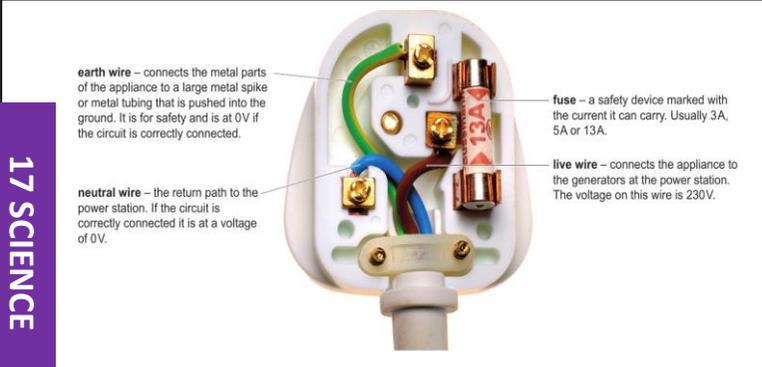
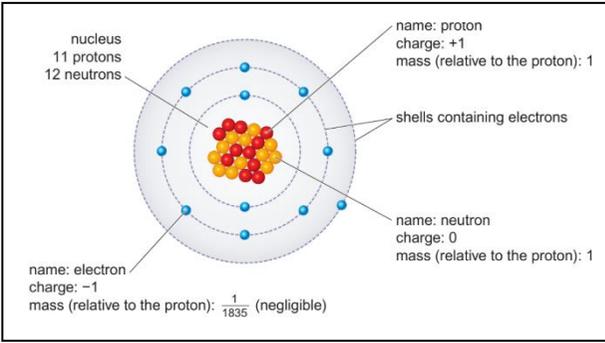
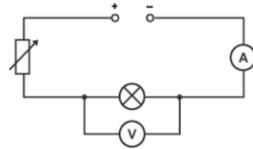
- current is the same through each component
- the total potential difference of the power supply is shared between the components
- the total resistance of the circuit is the sum of individual resistors

Direct current (d.c.) is the movement of charge in one direction only e.g. in batteries

Alternating current (a.c.) the movement of charge changes direction e.g. mains electricity

Ammeters measure **current** in **amps** and are connected in **series**

Voltmeters measure **potential difference** in **volts** and are connected in **parallel**.



energy transferred (J) = charge moved (C) × potential difference (V)

$$E = Q \times V$$

charge (C) = current (A) × time (s)

$$Q = I \times t$$

potential difference (V) = current (A) × resistance (Ω)

$$V = I \times R$$

power (W) = energy transferred (J) ÷ time taken (s)

$$P = E/t$$

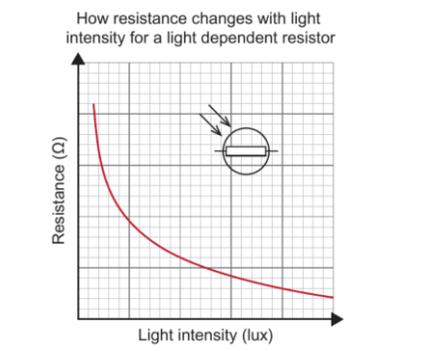
electrical power (W) = current (A) × potential difference (V)

$$P = I \times V$$

electrical power (W) = current² (A²) × resistance (Ω)

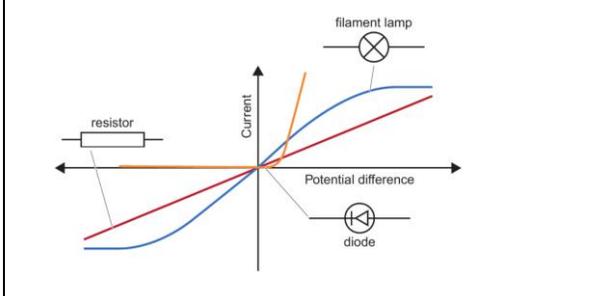
$$P = I^2 \times R$$

As the light intensity increases the resistance of the LDR decreases



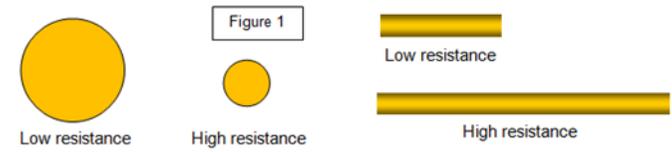
For a **fixed resistor** the current and potential difference are **directly proportional** so the resistance stays the same.

Filament lamps and **diodes** have **resistances** that **change** when potential difference changes.



UK domestic supply is a.c. 50 Hz and 230 V

Length and thickness of a wire will effect resistance

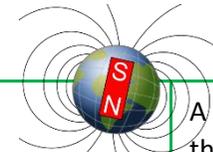
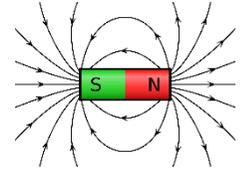
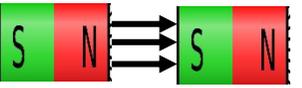


When there is an electric current flowing, there is an energy transfer which has a heating effect. It is the result of collisions between electrons and the ions in the lattice.

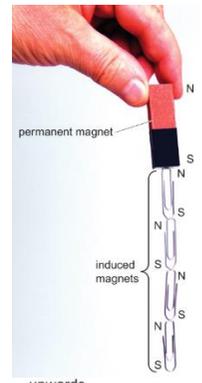
This can be reduced by using wires made of metals with low resistance e.g. copper, using thicker wires or by cooling the wires.

Earth's magnetic field	Plotting compass needle is a tiny magnet. It points north. This behaviour is evidence that the Earth has a magnetic field.	The Earth's magnetic field exists because of electric currents in the molten outer core which is made from a mixture of iron and nickel.
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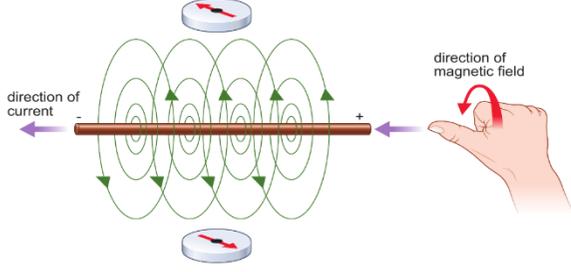
Uniform field	Same strength and direction between two magnets
Ununiformed field	Direction goes North to South. Filed lines stronger closer to magnet.



Permanent	A bar magnet that produces its own magnetic field	Will repel or attract other magnets and magnetic materials.
Induced	A temporary magnet	Becomes magnet when placed in a magnetic field.



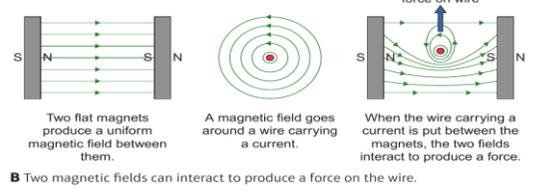
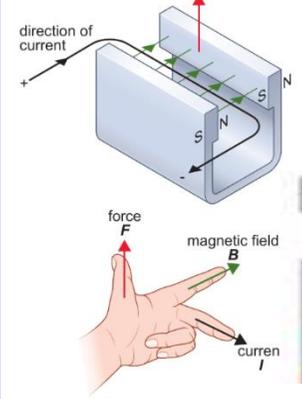
How a compass behaves when it is moved around is evidence that the Earth has a magnetic field which is similar to the shape of the magnetic field around a magnet. The Earth's



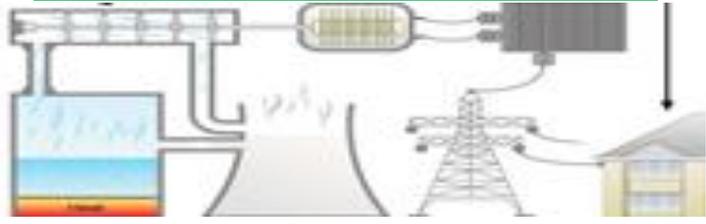
tric currents in the molten out core which is

18 SCIENCE

Higher - A current carrying conductor placed near a magnet experiences a force and that an equal and opposite force acts on the magnet. Magnetic forces are due to interactions between magnetic fields.

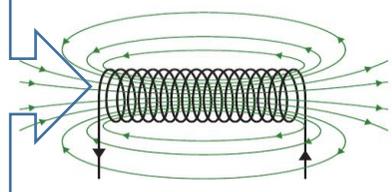


National Grid Distributes electricity generated in power stations around UK



Fields from individual coils add together to form an almost uniform filed along the centre of solenoid. Fields from individual coils cancel out to give a weaker field outside the solenoid.

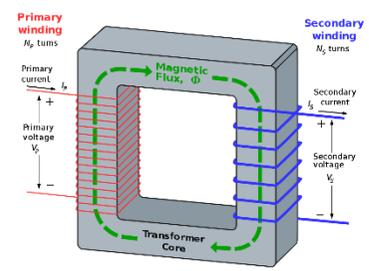
Field is strongest where lines are closest



Fleming's left had rule: Used to represent the relative directions of the force, the current and the magnetic field – motor effect

Force (N) = magnetic flux density (T or N/A m) x Current (A) x length (m)

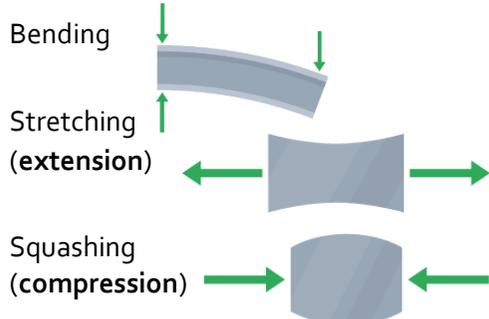
Transformers Change the size of alternating voltage
Made up of two coils of insulated wire wound on an iron core.



Step-up transformers	More turns on secondary coil	Potential difference increases
Step-down transformers	More turns on primary coil	Potential difference decreases

CP13

When a force is applied to an object, it can change shape (**distort**) by:



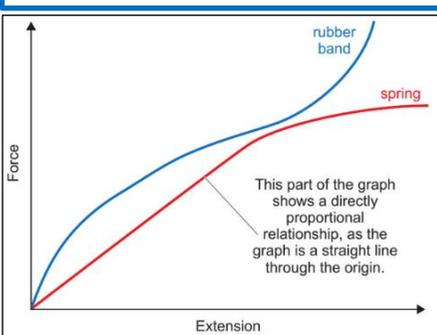
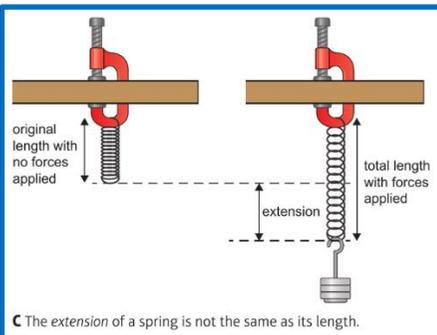
The forces on an object always exist in *pairs*: the force being applied, and the opposing force from the object

The energy transferred when stretching a spring is equal to the *work*

Force exerted on a spring = spring constant x extension (Hooke's Law)

$$F = k \times x$$

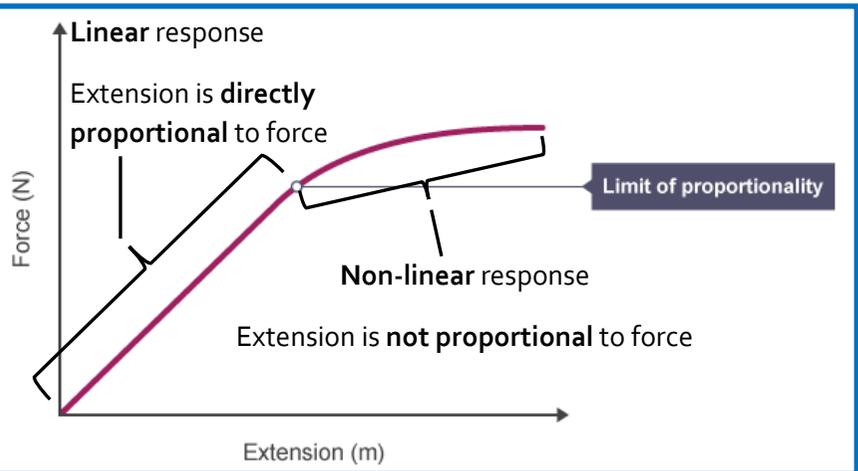
Energy transferred in stretching = 0.5 x spring constant x extension²

$$E = \frac{1}{2} \times k \times x^2$$


Elastic distortion is *reversed* when the force is removed.

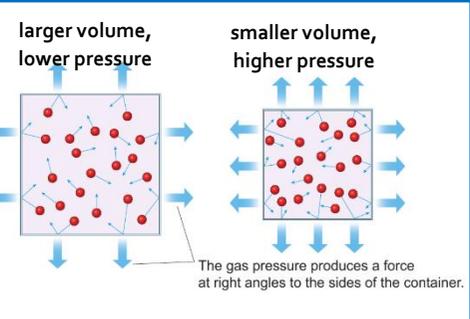
Inelastic distortion is not fully reversed when the force is removed - there is a *permanent* change in shape.

The **spring constant** is a measure of the *stiffness* of a spring, in N/m. Equal to the *gradient* of a force-extension graph.



19 SCIENCE

For a fixed mass of gas held at a constant temperature:

$$p_1 V_1 = p_2 V_2$$


Decreasing the volume at a fixed temperature increases the pressure because the same number of particles collide with the walls of the container more frequently as there is less space.

Doing work on a gas to compress it, like in a bike pump, increases the temperature as energy is transferred to the particles

Pressure is a measure of the force on a unit of surface area, where the force is **normal** (at right angles) to the surface. Measured in pascals (Pa), where 1 Pa is equal to 1 N/m².

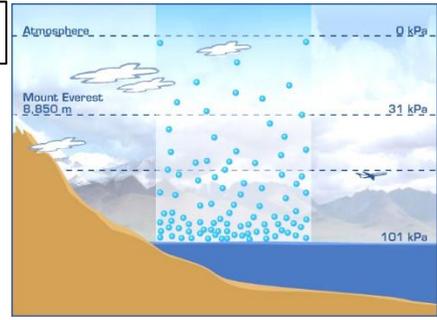
$$pressure = \frac{force\ normal\ to\ the\ surface}{area\ of\ surface}$$

$$P = \frac{F}{A}$$

pressure due to a column of liquid (Pa) = height of column (m) x density of liquid (kg/m³) x gravitational field strength

$$P = h \times \rho \times g$$

SP14-15



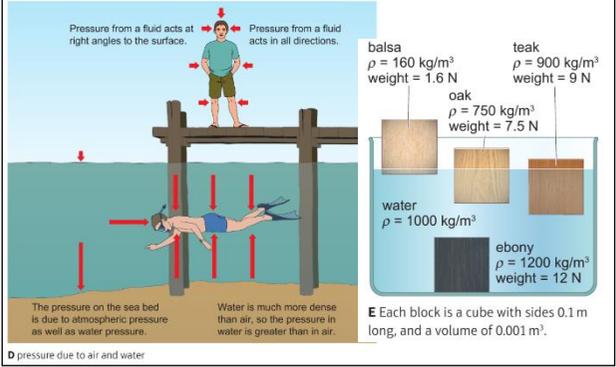
Atmospheric pressure *decreases* with height.

Pressure in fluids *increases* with depth and density.

The pressure in a liquid is equal to the pressure from the liquid above, *plus atmospheric pressure*.

Upthrust is a force caused by the *difference* in pressure between the top and bottom surface of an object

The upthrust is equal to the weight of water displaced. For an object to float, the upthrust must be greater than the object's weight.



atmospheric pressure	100 000 Pa
density of sea water	1030 kg/m ³
density of fresh water	1000 kg/m ³
gravitational field strength	10 N/kg

C standard values of pressure, density and gravitational field strength

SC25-26 Qualitative Tests for Ions, Nanoparticles and Bulk Properties (Triple

Flame tests (metal cations)

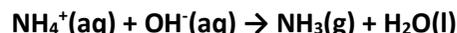
1. Clean wire loop in HCl
2. Pick up tiny amount of solid sample
3. Heat in roaring blue flame
4. Observe colour



Ion present	Flame test colour
Lithium, Li ⁺	Red
Sodium, Na ⁺	Yellow
Potassium, K ⁺	Lilac
Calcium, Ca ²⁺	Orange-red
Barium, Ba ²⁺	Green
Copper, Cu ²⁺	Blue-green

Ammonium cations, NH₄⁺

1. add dilute sodium hydroxide solution
2. warm the mixture



Ammonia gas (NH₃) is given off if ammonium ions are present, so test for ammonia gas - damp red litmus paper turns blue.

CORE PRACTICAL

You have to be able to describe exactly how to do each of these tests, know why you're doing each step and be able to use the results if they're given to you.

Metal cations in solution – add a few drops of sodium hydroxide solution, NaOH

Metal ion	Precipitate colour
Aluminium, Al ³⁺	White – dissolves in excess NaOH
Calcium, Ca ²⁺	White – unchanged by excess NaOH
Copper, Cu ²⁺	Blue
Iron(II), Fe ²⁺	Green
Iron(III), Fe ³⁺	Brown

eg $\text{Al}^{3+}(\text{aq}) + 3\text{OH}^-(\text{aq}) \rightarrow \text{Al}(\text{OH})_3(\text{s})$

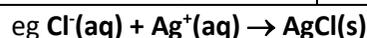
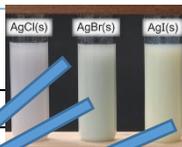


Halide (group VII) anions

Acidify first with nitric acid

removes CO₃²⁻ ions, but does not add Cl⁻ ions), then add silver nitrate solution, AgNO₃

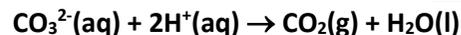
Halide ion	Precipitate colour
Chloride, Cl ⁻	White
Bromide, Br ⁻	Cream
Iodide, I ⁻	Yellow



These tests can be done using machines (instrumental methods), which can be more sensitive (detect smaller quantities), more accurate and faster.

Carbonate anions, CO₃²⁻

Add HCl – CO₂ produced, test with limewater.

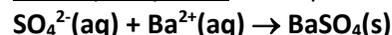


Sulfate anions, SO₄²⁻

Add HCl to remove CO₃²⁻ ions first

Add barium chloride solution, BaCl₂

White precipitate shows presence of SO₄²⁻ ions

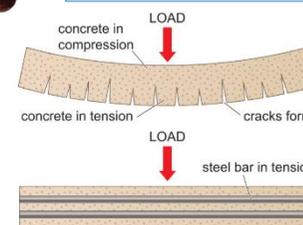


Nanoparticles

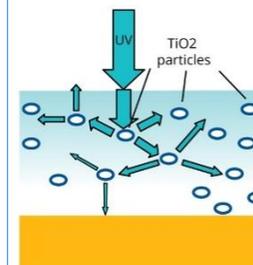
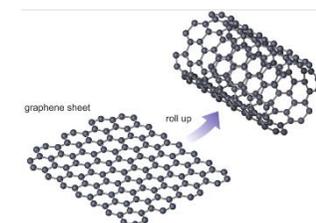
- Made of a few hundred atoms
- 1-100nm in size (Oxygen atom 0.1nm, bacterium 1000nm)
- 1nm = 1x10⁻⁹m
- Small size → **very large SA:vol ratio**
- Eg sunscreen containing invisible nano-TiO₂ particles which can absorb UV. Ordinary TiO powder is white.
- Eg catalysts on self-cleaning glass
- Fears about effect of such tiny particles on health/environment due to possibility to get into cells and catalyse unwanted reactions or deliver toxins.
- Uncertainty exists because nanoparticles are only recently in use.

Material	Properties	Examples/uses
Ceramics	Hard, stiff, brittle, chemically inert, poor thermal/electrical conductors, strong covalent or ionic bonds in giant crystal structures	Brick, porcelain
Glass	Giant irregular crystal structure – transparent. Made from molten sand (silicon dioxide). Poor thermal/electrical conductors, chemically inert.	Glass!
Polymers	High average formula masses. Made from monomers. Easily moulded, poor thermal/electrical conductors, waterproof, chemically inert	Poly(ethane), poly(styrene)
Metals	Strong, hard, high density, shiny, high melting point, good thermal/electrical conductors	Steel, copper, chromium
Composites	Material that takes advantages of two or more materials combined in use. One material makes up for the weaknesses of the other.	Reinforced concrete, carbon fibre

Be able to compare the properties and uses of materials.



D Steel-reinforced concrete resists cracking much better than concrete alone.



EDUQAS Spec B Overview

This page provides an overview of your specification and some exam tips. Once you are familiar with this, you should use your revision cards or other resources to revise.

Assessment overview:

Name	Nature of assessment	Time	Marks/ proportion of total mark
Component 1	Three questions: one for the content of each of the three themes.	1 hr 45 mins	96 marks/ 40%
Component 2	A three-part paper introducing you to a geographical problem, exploring different solutions and asking you to justify your choice of solution.	1 hr 30 mins	72 marks/ 30%
Component 3	A three-part paper. The first two parts test your ability to apply your fieldwork techniques to new situations. The third part tests your understanding of wider UK concepts and to make a UK-based decision.	1 hr 30 mins	72 marks/ 30%

Key themes and topics:

Theme 1: Changing Places- Changing Economies	Theme 2: Changing Environments	Theme 3: Environmental Challenges
Urbanisation in contrasting global cities	Coasts and coastal management	How ecosystems function
Urban and rural processes and change in the UK	Rivers and river management	Ecosystems under threat
Global perspectives on development issues	Weather and climate	Water resources and management
	Climate change – cause and effect	Desertification

Paper 1:

Q 1: Questions will focus largely on just one topic from theme 1 (e.g. Urbanisation).

Q 2: Questions will focus largely on just one topic from theme 2 (e.g. Coastal management).

Q 3: Questions will focus largely on just one topic from theme 3 (e.g. Ecosystems under threat).

Paper 2:

Q 1: Information about the causes and impacts of the concept (e.g. hurricanes, coastal erosion, etc.). **It will test your knowledge, numeracy skills and ability to describe and explain.**

Q 2: Information about possible solutions. It will ask you to use the resource booklet to answer questions – your geographical knowledge will help to expand on this. **It is testing your ability to understand and apply new information.**

Q 3: You choose and justify the best approach from those in question 2. **It is testing your skills of logic, ability to identify advantages/ disadvantages of different proposals, and how well you can form a balanced opinion that**

Paper 3:

Q 1: Questions will be on your fieldwork methodology (e.g. Qualitative Surveys)

Q 2: Questions will be on your fieldwork theme (e.g. Sustainable Communities)

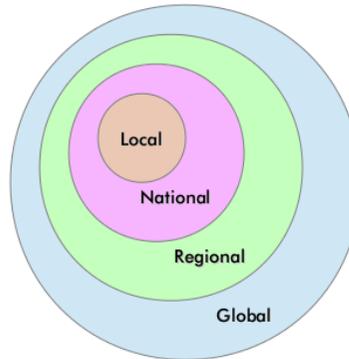
Q 3: Questions will apply your fieldwork theme to a wider issue within the UK. It will be similar to a shorter version of paper 2.

Longer Response Questions

For each exam you will face some longer response questions. Many of which will ask you make a choice/ justify your opinion. This is how to get maximum marks.



1. Give a **balanced opinion** – don't just go on about only one option, discuss advantages and disadvantages of a range of options given then reach a conclusion. This unlocks the higher marks for these questions. **Elaborate where you can.**

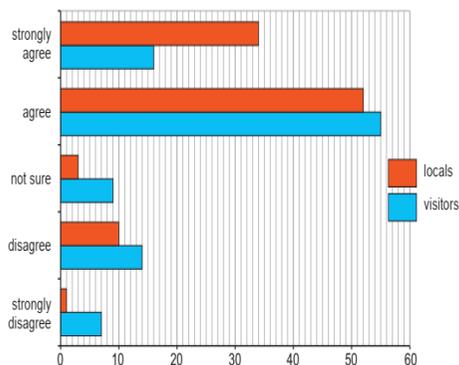


2. If you can, **talk about the scale** of impact that the options will have (will it affect just a small local community, an entire region, the country, etc.).



3. Consider if the effects if the different options are **long term, medium term or short term**. It may be a great and cheap option but only last in the short term.

Graph 2.2 – People were asked whether or not they agree with the following statement. 'Traffic has a negative environmental impact on the local area around Glastonbury.'



4. The resource booklet (and maybe the exam itself) contains data/ evidence. Use it! Fit any data/ evidence you can into your answers as evidence. You can do this with quotes/maps/photos too – **you get more marks for doing this!**



5. A **stakeholder is somebody who is affected by the decision**. Try to think about different stakeholders and write about how they will be affected (positively or negatively). Again, write on your resource booklet it helps to identify them.

6. Perhaps most importantly, you need to think about **sustainability** and actually use the word sustainable in your answer. You will be writing about the fact that one idea is better than the other(s) - how sustainable the options are will be a big part in your decision. They could be:

- **Economically sustainable / unsustainable**
- **Environmentally sustainable / unsustainable**
- **Socially sustainable / unsustainable**

3-Legged Sustainability Stool

Sustainability

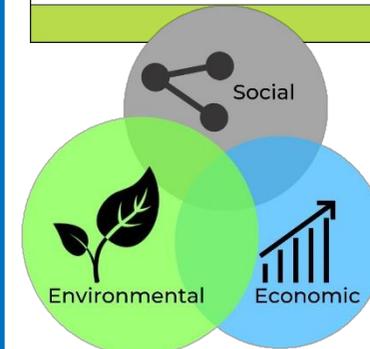


Economic Leg
Good Jobs
Fair wages
Security
Infrastructure
Fair Trade

Environmental Leg
0 Pollution & Waste
Renewable Energy
Conservation
Restoration

Social Leg
Working conditions
Health services
Education services
Community & Culture
Social justice

Quality of Life / Genuine Wealth / Genuine Progress



Knowledge Organiser: The American West 1835 - 1895

KT1: The Early Settlement of the West 1835 - 1862

The Early Settlement of the West	
1	At the start of this period the Great Plains were home to the Plains Indians, who lived a nomadic life. The Americans who came to the Plains were just travelling through and at first relations were peaceful. However, increasing numbers of Americans and the development of the settlement on the Plains brought the two into conflict. Meanwhile, as this settlement ran ahead of the forces of the law, there were problems with lawlessness.
Key events	
2	1824 Bureau of Indian Affairs set up
3	1830 Indian Removal Act passed
4	1836 Oregon Trail opened
5	1845 Concept of Manifest Destiny becomes popular
6	1845-48 Mexican-American War
7	1846-47 Mormon migration
8	1849 California Gold Rush
9	1851 - January Indian Appropriations Act passed
10	1851 - September Fort Laramie Treaty signed
11	1854 Kansas – Nebraska Act passed
12	1857-58 Mormon War
13	1859 Colorado Gold Rush
14	1861 American Civil War
Key Concepts	
15	The Plains Indians – Lived a nomadic lifestyle and shared a sense of unity with nature. They did not believe that land could be owned. In war, ‘counting coup’ was the highest form of honour. Their lifestyle meant many white Americans saw them as ‘savages’ and ‘uncivilised’.
16	Increased Migration and Settlement – The opening of the Oregon Trail, the California Gold Rush and Mormon persecution led to a huge increase in migration and settlement on the Plains. In turn, this led to increased conflict between the Plains Indians and the white settlers.
17	Fort Laramie Treaty 1851 – Fear of Indian attack led US government to go back on earlier agreements of a ‘permanent Indian frontier’. Language barriers and different styles of government meant the treaty would ultimately fail.
18	Lawlessness – US Federal Government found it difficult to implement law and order on Great Plains due to increased number of mining camps. This led to the organisation of vigilance committees who took the law into their own hands and were often corrupt.

Key Words		
19	Tribe	The name given to the different groups of Plains Indians. E.g. Sioux, Cheyenne and Blackfoot
20	Band	Indian tribes were divided into ‘bands’
21	Chief	Leader of a band. Chosen because of their wisdom/ skills as a hunter/ warrior.
22	Warrior Society	The best warriors from each band. Supervised hunting and protected bands from attack.
23	Nomadic	Having no permanent home, travelling from place to place to find fresh pasture for animals.
24	Counting Coup	Landing a blow on an enemy and getting away without injury (highest form of honour in war).
25	Indian Trade and Intercourse Act	An agreement that set out a permanent Indian frontier (divided Indian territory from Eastern states).
26	Indian Appropriations Act	US Government allocated money for setting up Indian reservations in modern day Oklahoma.
27	Fort Laramie Treaty	Treaty that set out territories for the Plains Indians, white settlers were allowed into Indian territory in exchange for resources provided by US government.
28	Manifest Destiny	Belief that it was God’s will that white Americans should settle over all America and spread their ‘civilised’ way of life.
29	The Gold Rush	The discovery of gold in California which led to migration of ‘forty-niners’ – people who wanted to find a fortune.
30	Oregon Trail	The main pathway for American emigrants searching for new lands and opportunity in the West.
31	Mormon	Members of the Church of Jesus Christ of Latter Day Saints founded by Joseph Smith, 1830.
32	Vigilance Committees	Group of ordinary citizens that decides to punish a group of law-breakers itself instead of relying on the official justice system.
33	Miners’ Courts	Courts set up by miners to settle disputes over claims to land.

10 key jobs

1. avocat (m) – lawyer
2. coiffeur / coiffeuse - hairdresser
3. comptable (m) – accountant
4. facteur (m) – postman
5. fermier (m) – farmer
6. infirmier / infirmière - nurse
7. informaticien (m) – IT worker
8. ingénieur (m) - engineer
9. médecin – doctor
10. vétérinaire - vet

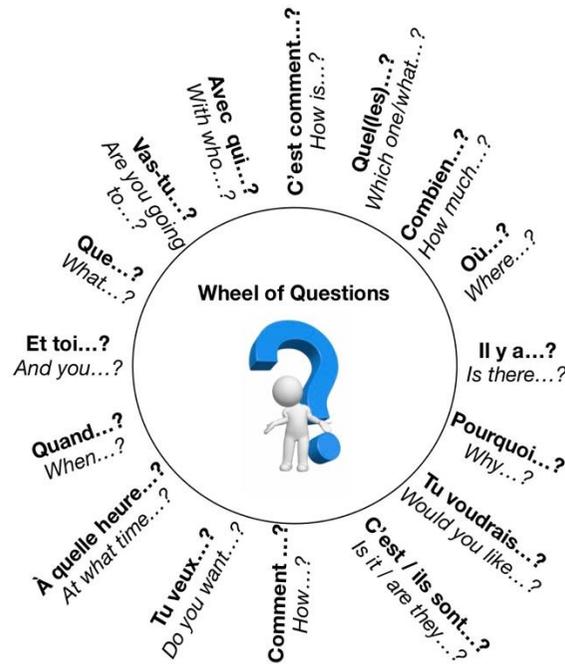
10 key phrases for work + future plans

6. une année sabbatique – gap year
7. l'apprenti(e) – apprentice
8. l'avenir - future
9. le bac – A-levels
10. le boulot – work
11. l'entreprise (f) – firm, enterprise
12. la faculté – university, faculty
13. la licence - degree
14. le lycée – sixth form / college
15. le petit job – part time job

10 key verbs for work + future plans

1. avoir envie de – to want to
2. avoir l'intention (de) – to intend (to)
3. étudier – to study
4. laisser tomber – to drop
5. espérer – to hope
6. gagner – to earn
7. recevoir – to receive
8. rêver – to dream
9. travailler – to work
10. voyager – to travel

French Year 11 Spring



Coping with the photo card

Il s'agit de la maison / les loisirs	It is about the home / leisure
Dans la photo je peux voir une maison	In the photo I can see a house
Il y a deux personnes / un arbre	There is/are 2 people / a tree
En arrière-plan je vois des garçons	In the background I see some boys
Ils sont en train de parler / manger	They are talking / eating
Ils ont l'air heureux / triste	They seem happy / sad
Il fait du soleil / froid / du vent	It is sunny / cold / windy
Je suppose que c'est l'été / l'hiver	I suppose it is summer / winter

5 key answers for any conversation topic

1. **Décris... ton ami / ton prof / ton patron?**
Mon ami s'appelle Jean. Je m'entends bien avec mon ami car il est très sympa, intelligent et drôle. Il est grand avec les cheveux bouclés.
My friend is called John. I get on well with him as he is very kind, intelligent and funny. He is tall with curly hair. DESCRIPTIONS
2. **Que fais tu pendant le temps libre / les vacances / le week-end?**
Normalement je retrouve mes copains et on va au cinéma ou on mange au MacDo. J'aime jouer au volley à la plage aussi.
Normally I meet my friends and we go to the cinema or we eat at MacDonalds. I like playing volley at the beach too. PRESENT ACTIVITIES
3. **Qu'est ce que tu as fait le week-end dernier / en vacances / hier soir?**
Le weekend-dernier j'ai retrouvé mes amis. On est allé au bowling. Après nous sommes allés au restau. C'était génial!
Last week-end I met my friends. We went to the bowling alley. Afterwards we went to the restaurant. It was great! PAST ACTIVITIES
4. **Qu'est-ce que tu vas faire ce week-end / ce soir / pour les vacances?**
Ce week-end je vais voir mes grand-parents. Nous allons manger chez eux et aussi je vais faire mes devoirs de français. Ce sera chouette!
😊
This weekend I am going to see my grandparents. We are going to eat at their house and also I am going to do my French homework. It will be great! FUTURE ACTIVITIES
5. **Comment fêtes-tu Noël / ton anniversaire / le fin des examens?**
On décore la maison et on mange un grand gâteau au chocolat. Avec mes amis je fais la fête et on prépare un repas. On s'offre les cadeaux.
We decorate the house and we eat a big chocolate cake. I celebrate with my friends and we prepare a meal. We give each other presents. CELEBRATIONS

French Year 11 Spring

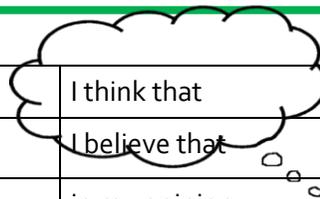
Key verbs in 1st person

je suis	I am
j'ai	I have
j'aime	I like
j'adore	I love
je déteste	I hate
je n'aime pas	I don't like
je veux	I want
je vais	I go
je joue	I play
j'utilise	I use

REMEMBER to always include:
A past, present, and future

Opinions

je pense que	I think that
je crois que	I believe that
à mon avis	in my opinion
selon mes parents	according to my parents
d'après mon père	according to my dad
je sais que	I know that
étant donné que	given that
je trouve que	I find that
j'ai l'impression que	I get the impression that
pour moi	for me



Other useful verb phrases

il y a	there is
c'est	it is
il est	he is
il a	he has
avez-vous / as-tu...?	do you have...?
y a-t-il...?	is there...?
il n'y a pas (de)	there isn't (any)
ce n'est pas	it isn't
il fait beau	it is nice weather
il faisait du vent	it was windy

ALWAYS include an opinion **AND** a justification
e.g. j'aime mon collègue **parce que** c'est amusant.

Key verbs in different tenses

je voudrais	I would like
c'était	it was
il y avait	there was / were
j'ai mangé	I ate / have eaten
je vais aller	I am going to go
j'irai	I will go
je suis allé(e)	I went
ce sera	It will be
je voudrais visiter	I would like to visit
je mangerai	I will eat



Positive + negative adjectives

génial	great
bien	good
intéressant	interesting
amusant	funny
fantastique	fantastic
affreux	awful
mauvais	bad
terrible	terrible
nul	rubbish
ennuyeux	boring

Impress the examiner

bien que j'aime	although I like
bien que je sois	although I am
bien que j'aie	although I have
quand j'étais petit(e)	when I was little
il me semble que	it seems to me that
après avoir mangé	after having eaten
après avoir visité	after having visited
grâce à	thanks to
je dirais que	I would say that
il faut que (+subj)	it is necessary that

10 key jobs

11. abogado – lawyer
12. contable (m) – accountant
13. granjero – farmer
14. enfermero – nurse
15. hombre de negocios - businessman
16. ingeniero - engineer
17. médico – doctor
18. peluquero - hairdresser
19. periodista (m) - journalist
20. veterinario - vet

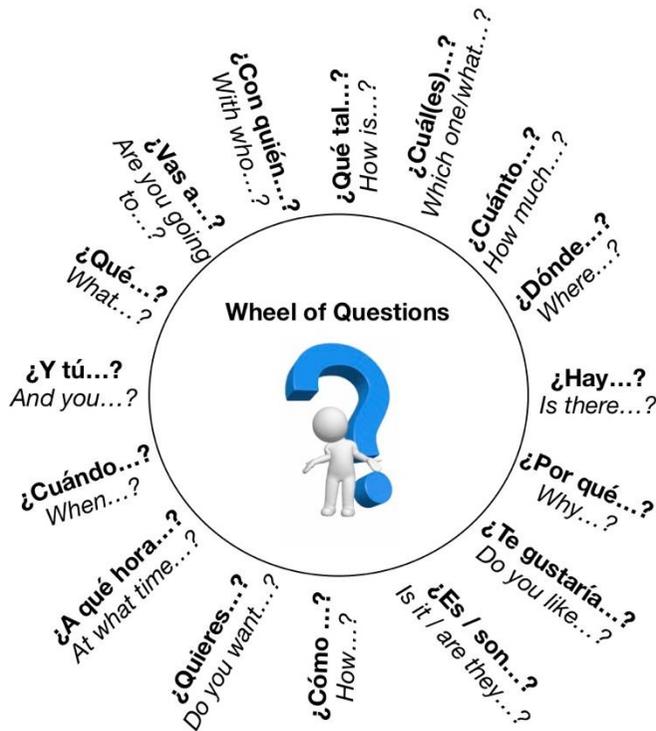
10 key phrases for work + future plans

21. un año sabático – gap year
22. el aprendiz – apprentice
23. el bachillerato – A-levels
24. el empleo – job, employment
25. una empresa – company
26. la formación – vocational training
27. el jefe – boss
28. el sueldo - wages
29. el título – degree
30. la universidad - university

10 key verbs for work + future plans

11. conseguir – to get, achieve
12. dejar – to leave
13. encontrar – to find
14. esperar – to hope, expect
15. estar en paro - unemployed
16. ganar – to earn
17. obtener – to get, obtain
18. rêver – to dream
19. trabajar – to work
20. viajar – to travel

Spanish Year 11 Spring



Coping with the photo card

Trata de el hogar / el ocio	It is about the home / leisure
En la foto puedo ver una casa	In the photo I can see a house
Hay dos personas / un árbol	There is/are 2 people / a tree
Al fondo veo unos chicos	In the background I see some boys
Están hablando / comiendo	They are talking / eating
Parecen contento / triste	They seem happy / sad
Hace sol / frío / viento	It is sunny / cold / windy
Supongo que es verano / invierno	I suppose it is summer / winter

5 key answers for any conversation topic

16. Describe... tu amigo / tu profe / tu jefe.

Mi amigo se llama Juan. Me llevo bien con mi amigo porque es simpático, inteligente y gracioso. Es grande y tiene el pelo rizado.

My friend is called John. I get on well with him as he is very kind, intelligent and funny. He is tall with curly hair. DESCRIPTIONS

17. ¿Qué haces en tu tiempo libre / las vacaciones / el fin de semana?

Normalmente encuentro mis amigos y vamos al cine o comemos en MacDonalds. También me gusta jugar al voleibol en la playa.

Normally I meet my friends and we go to the cinema or we eat at MacDonalds. I like playing volley at the beach too. PRESENT ACTIVITIES

18. ¿Qué hiciste el fin de semana pasado / en las vacaciones / anoche?

El fin de semana pasado me encontré con mis amigos. Fuimos a la bolera. Después fuimos al restaurante. ¡Fue genial!

Last week-end I met my friends. We went to the bowling alley. Afterwards we went to the restaurant. It was great! PAST ACTIVITIES

19. ¿Qué vas a hacer el fin de semana / esta noche / para las vacaciones?

Este fin de semana voy a ver mis abuelos. Vamos a comer en su casa y además voy a hacer mis deberes de español. ¡Será estupendo! ☺

This weekend I am going to see my grandparents. We are going to eat at their house and also I am going to do my Spanish homework. It will be great! FUTURE ACTIVITIES

20. ¿Cómo celebras Navidad / tu cumpleaños / el fin des exámenes?

Decoramos la casa y comemos un gran pastel de chocolate. Tengo una fiesta con mis amigos y preparamos una comida. Nos damos regalos.

We decorate the house and we eat a big chocolate cake. I have a party with my friends and we prepare a meal. We give each other presents. CELEBRATIONS

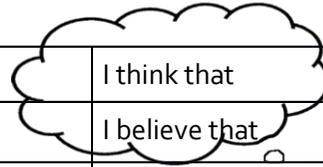
Key verbs in 1st person

Soy	I am
Tengo	I have
Me gusta	I like
Me encanta	I love
Odio / detest	I hate
No me gusta	I don't like
Quiero	I want
Voy	I go
Juego	I play
Hablo (-ar verb)	I speak
Como (-er verb)	I eat
Vivo (-ir verb)	I live

Spanish Year 11 Spring

Opinions

Pienso que	I think that
Creo que	I believe that
En mi opinion	in my opinion
Según mis padres	according to my parents
Estoy seguro que	I am sure that
Desde mi punto de vista	From my point of view
Para mí	For me



Other useful verb phrases

Hay	There is
Es	It is
Tiene	It has
No hay	There isn't
No es	It isn't
Hace buen tiempo	It is nice weather
Hizo viento	It was windy

REMEMBER to always include:

a **past**, **present**, and **future**e.g. Ayer **fui** al cine, hoy **voy** a la piscina y mañana **voy a ir** a las tiendas.

an opinion + a justification

e.g. Me gusta mi colegio **porque** los profesores son estupendos.

Key verbs in different tenses

Me gustaría	I would like
Era / fue	It was
Había	There was / were
Hablé (-ar verb)	I spoke
Comí (-er / -ir verbs)	I ate
Voy a ir	I am going to go
Iré	I will go
Comeré	I will eat
Fui	I went
Sera	It will be
Me gustaría visitar	I would like to visit

REMEMBER to
always
include:
A past,
present, and
future.

Positive + negative adjectives

genial	great
bueno	good
interesante	interesting
gracioso	funny
divertido	fun
emocionante	exciting
fatal	awful
malo	bad
asqueroso	disgusting
molesto	annoying
aburrido	boring

Impress the examiner

Aunque me gusta	Although I like
Lo que más me gusta	What I like the most
Suelo jugar	I usually play
Cuando era más joven	When I was younger
Me parece que	It seems to me that
Después de comer	After eating
Antes de visitar	Before visiting
Cuando tenga 18 años	When I am 18
Diría que	I would say that
Es necesario	It is necessary

CHRISTIANITY

A rescue mission



The Nature of God – God is omnipotent (all powerful); omnibenevolent (all loving/ kind); one God but three persons (The Trinity); Just (fair); The Word (Jesus).

The problem of Evil-

Against God-

- God cannot be omnibenevolent- people suffer
- God cannot be omnipotent- God cannot stop the suffering.
- God probably does not exist.

For God –

- God is love. People will use free will to sin
- God is omnipotent, but he allows humans to choose to do good.
- God has suffered too. Sent Jesus to die.
- Good things can come out of suffering (courage, kindness, forgiveness,

Sin

- ❖ Adam and Eve disobeyed God (original sin)
- ❖ Humans became ‘sinners’ and tried to keep rules
- ❖ Humans needed a saviour (Jesus)
- ❖ Jesus died for humans to wash away sins (atonement) he gave grace (mercy)
- ❖ Jesus saved sinners from hell (salvation)
- ❖ Jesus rose from the dead (resurrection) Jesus went back to heaven.

The church – in what order would you put the important functions of the church.

- ❖ **Worship** – praise songs; prayer; living a good life
- ❖ **Baptism** sacrament- infant or believers
- ❖ **Holy Communion** sacrament- bread/wine
- ❖ **Bible Teaching** (God’s word) help Christians
- ❖ **Charity**- Food banks, street pastors.
- ❖ **Public service** – Weddings, funerals, Xmas service
- ❖ **Mission** – converting non-Christians/evangelism
- ❖ **Protest**, fighting for equality or against persecution

You choose	
1	
2	
3	
4	
5	
6	
7	
8	

What do these words mean? Test yourself. Get others to test you.

Omnipotent; omnibenevolent; Trinity; Just; The Word (Jesus); Free will; original sin; saviour;

Key questions-

1. God is to blame for our suffering. Do you agree?
2. Name 5 things Jesus did to save the world.
3. What are the top 3 functions of the church? Why?

Key questions-

1. What was the key thing that Siddhartha wanted an answer to?
2. Explain 5 Buddhist beliefs
3. What is in a Buddhist temple?

Buddhism

self-improvement



Siddhartha
Gautama
The Buddha

- Old age
- Sickness
- Death

Saw the 4 sights



Lived a strict ascetic life.
“Why do we suffer?”



Resisted Mara (a demon)



Became Enlightened



(Amazing birth)



(Brought up as a prince)

“There is nothing comparable to one who is awakened.” (The Buddha)

Buddhist Beliefs + Buddhist Practices

- Dependent Arising- we all depend on others.
- Types of Buddhism – Theravada (the old) Mahayana (the new)

The 3 Realizations	The 3 Refuges	The 3 marks of existence
<ul style="list-style-type: none"> . He’ d had previous lives . Reincarnation is real . Selfishness= suffering 	(3 safe places) <ul style="list-style-type: none"> . The Buddha . The Dharma (Holy Book) . The Sangha (community) 	<ul style="list-style-type: none"> . Dukkha – We all suffer . Anicca- We all change . Anatta- we will all become a new person.
The 4 Noble Truths	The 5 Moral Precepts	The 6 Perfections
<ol style="list-style-type: none"> 1. Suffering exists (dukkha) 2. Suffering is caused by craving 3. There is hope (nirodha) 4. We must take action (magga) 	<ol style="list-style-type: none"> 1. Do not harm life. 2. Do not steal 3. Do not misuse sex 4. Do not lie 5. Do not misuse drugs 	<ul style="list-style-type: none"> • Generosity • Morality • Patience • Energy • Meditation • Wisdom

8-fold path Right: action; speech; job; effort; mindfulness; concentration; understanding; emotion

Types of meditation	Temple features	Buddhist Festivals
Samatha – Calms Mind Vipassana - Develops wisdom Tibetan - Meditate on scriptures	<ul style="list-style-type: none"> . Buddha statue (rupa) . Worship (puja) . Chanting (mantras) . Offering (£/flowers) . Meditation hall (gompa) . Tower (pagoda stupa) 	Wesak- celebrates the Buddha Parinirvana- remembers his death. Buddhist Death Rituals. Theravada- e.g. shrines to the dead Mahayana- e.g. Mountain sky burials.

What do these words mean? Test yourself. Get others to test you.

Ascetic; enlightened; dependant. Theravada; Mahayana; refuges; sangha; dharma; dukkha; anicca; anatta; nirodha ; magga; samatha; vipassana; puja; wesak; paranirvana.



“Go make disciples of all nations” (Jesus)



“Christ is the atoning sacrifice for our sins” (1 John 2)

“God is love” (1 John)

“God is fair and just” (Psalm 25)

CHRISTIAN BELIEFS	<ul style="list-style-type: none"> * Follow the 10 Commandments * Only God can take life * Follow Jesus' example * Forgive your enemies * We're all one in Christ Jesus * We're all made in the image of God 	<ul style="list-style-type: none"> * Be a good steward of God * Love your neighbour (Mark 12:31) * Life is a gift from God * Life is sacred (sanctity) * God is merciful 	BUDDHIST BELIEFS	<ul style="list-style-type: none"> * Show metta (loving kindness) * Produce good karma * Show karuna (compassion) * Give up cravings (4 Noble Truths) * Do not harm life (5 Moral Precepts) * Do right actions (8 Fold Path) 	<ul style="list-style-type: none"> * Avoid hatred (one of the 3 spiritual poisons) * Live a selfless life * Achieve enlightenment
FOR ABORTION	 <ul style="list-style-type: none"> • Women should choose • Life starts at 24 weeks • No to unwanted babies 	<ul style="list-style-type: none"> • No to babies from rape • No to severely disabled babies (they will suffer) 	AGAINST ABORTION	 <ul style="list-style-type: none"> • Life begins at conception • Adoption is better than abortion • Protect the unborn 	<ul style="list-style-type: none"> • Offer young mums support • What if we had been aborted?
FOR EUTHANASIA	 <ul style="list-style-type: none"> • People should die with dignity • Why prolong pain? 	<ul style="list-style-type: none"> • The quality of life is key • People should be able to choose 	AGAINST EUTHANASIA	 <ul style="list-style-type: none"> • Ill people get pain relief • Old people will come under pressure to die • The sanctity of life is key 	<ul style="list-style-type: none"> • People can grow spiritually through their suffering
FOR ANIMAL RIGHTS	 <ul style="list-style-type: none"> • Factory farms are cruel • Meat is murder • Animal experiments are cruel 	<ul style="list-style-type: none"> • Drugs that work on animals may not work on humans (Thalidomide) 	AGAINST ANIMAL RIGHTS	 <ul style="list-style-type: none"> • Humans are more important • We must find cures for humans using experiments 	<ul style="list-style-type: none"> • Animals in experiments can have pain relief
FOR SAVING PLANET EARTH	 <ul style="list-style-type: none"> • Global warming is dangerous • We can save the planet 	<ul style="list-style-type: none"> • We must help the future generations 	AGAINST SAVING PLANET EARTH	 <ul style="list-style-type: none"> • The economy is more important • There is no proof for global warming 	<ul style="list-style-type: none"> • Fighting poverty is more important than the planet
FOR VIOLENCE	 <ul style="list-style-type: none"> • Self-defence is a right • We need our armed forces 	<ul style="list-style-type: none"> • 'An eye for an eye' (Bible) 	AGAINST VIOLENCE	 <ul style="list-style-type: none"> • <u>All protests should</u> be non-violent (Martin Luther King/Gandhi) • Don't let violence escalate (increase) 	<ul style="list-style-type: none"> • Pacifism (non-violence) creates peace
FOR TERRORISM	 <ul style="list-style-type: none"> • Terrorists are soldiers • The cause justifies the means 	<ul style="list-style-type: none"> • Terrorists are freedom fighters 	AGAINST TERRORISM	 <ul style="list-style-type: none"> • Violence against the innocent is evil • Terrorist are criminals 	<ul style="list-style-type: none"> • Terrorism leads to war
FOR WAR	 <ul style="list-style-type: none"> • Some wars are justified (Just Wars) • Nuclear weapons can be a deterrent against attack 	<ul style="list-style-type: none"> • We need to defend ourselves 	AGAINST WAR	 <ul style="list-style-type: none"> • War has dreadful consequences • War is due to greed/hate • Holy wars in the name of religion are wrong 	<ul style="list-style-type: none"> • Nuclear war could end the world
FOR BREAKING THE LAW	 <ul style="list-style-type: none"> • Bad laws need to be broken (MLK) • Follow Jesus' example 	<ul style="list-style-type: none"> • OK if someone is in extreme poverty and steals 	AGAINST BREAKING THE LAW	 <ul style="list-style-type: none"> • Law breaking is wrong • We should uphold the law to avoid chaos 	<ul style="list-style-type: none"> • There are no victimless crimes
FOR TOUGH PUNISHMENT	 <ul style="list-style-type: none"> • The victim needs justice • Send out a warning to others (deterrent) 	<ul style="list-style-type: none"> • Life sentences protect the public • Corporal punishment is fair. 	AGAINST TOUGH PUNISHMENT	 <ul style="list-style-type: none"> • Prisons should reform not hurt prisoners • Use community service • Show God's love eg counselling 	<ul style="list-style-type: none"> • Prisoners will want revenge
FOR CAPITAL PUNISHMENT	 <ul style="list-style-type: none"> • It's fair. Eye for an eye • Killing murderers protects the public 	<ul style="list-style-type: none"> • Capital punishment saves money on prison costs 	AGAINST CAPITAL PUNISHMENT	 <ul style="list-style-type: none"> • Innocent people may die • We make ourselves as ethically bad as the murderer 	<ul style="list-style-type: none"> • Capital punishment is not a deterrent against murder
FOR DIFFERENT M/F ROLES	 <ul style="list-style-type: none"> • Bible teaches different roles for men/women • The disciples were male 	<ul style="list-style-type: none"> • In the Bible leadership was male 	AGAINST DIFFERENT M/F ROLES	 <ul style="list-style-type: none"> • Women should have equal rights • We have women bishops • Jesus respected women 	<ul style="list-style-type: none"> • Look for the skill not the gender
FOR EQUAL RIGHTS	 <ul style="list-style-type: none"> • Prejudice (prejudging) is wrong • Discrimination is wrong 	<ul style="list-style-type: none"> • Positive discrimination is good eg disabled parking 	AGAINST EQUAL RIGHTS	 <ul style="list-style-type: none"> • Homosexuality is a sin • Positive discrimination is unfair eg job quotas 	<ul style="list-style-type: none"> • We should focus more on responsibilities rather than rights
FOR GETTING RICH	 <ul style="list-style-type: none"> • God wants to bless us • We deserve our wages 	<ul style="list-style-type: none"> • The poor should take more responsibility for themselves 	AGAINST GETTING RICH	 <ul style="list-style-type: none"> • Go the 'Middleway' - Not too rich or poor • We should challenge loan sharks, slave wage employers and people traffickers 	<ul style="list-style-type: none"> • You can't worship God and money

29 RE

Key Words:
 Steward; neighbour; metta; karuna; noble truths; moral precepts; conception; sanctity; pacifism; deterrent; prejudice; discrimination; quotas; escalation; corporal punishment (giving prisoners pain).

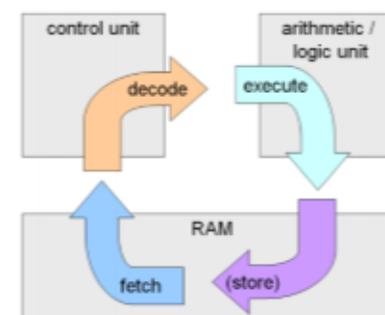
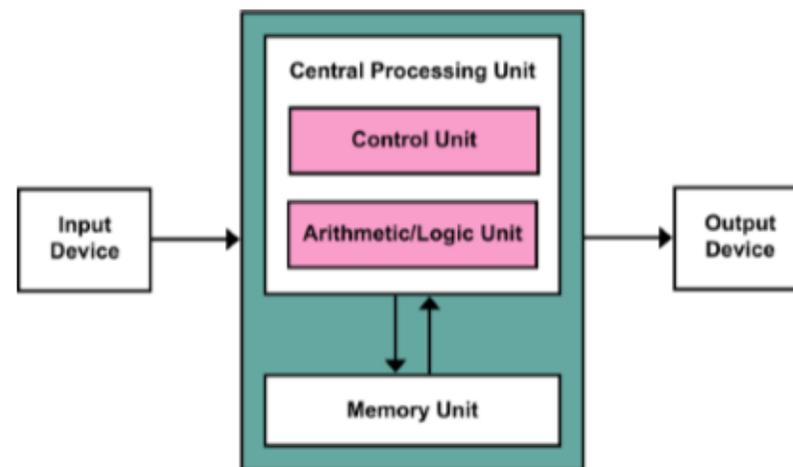
KEY Q's

1. Name 3 key Christian beliefs that link to each of the 13 topics.
2. Name 3 key Buddhist beliefs that link to each of the 13 topics.
3. What are your views on the 13 issues above?
4. Memorise one argument for and against each of the 13 topics.

GCSE OCR Computer Science 1.1 System Architecture

Key Vocabulary

CPU	Central Processing Unit
MAR	Memory Address Register: which holds memory addresses (locations) for data and instructions which the CPU needs
MDR	Memory Data Register
Program Counter	The address (location) of the instruction
Accumulator	Holds values for the ALU
ALU	Arithmetic Logic Unit: It is the part of the CPU which does all the calculations
CU	Control Unit: Controls the flow of data within the CPU
Cache	Stores frequently used instructions & data, that can be accessed faster than RAM.
Clock Speed	The number of processes a second the CPU can perform
Number of Cores	The number of processors in a CPU
Embedded System	A computer system with a dedicated function
General Purpose	A computer system which is not embedded system. <i>i.e</i> A laptop



More than one core?

When describing the cores of a Computer System; you need to talk about .

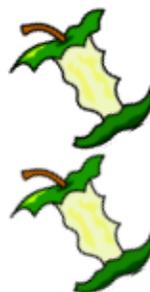
1. The notion of the processors acting **at the same time**
2. More Cores means more **parallel processing**
3. **State exactly how many cores** are there, i.e. a dual core has 2 cores a quad core has 4 cores
4. Each core can **work independently** of each other

Have you applied?

Definitions **must** be applied to the scenario otherwise you will receive 0 marks.

Example: Is a Smart watch an embedded system? *2 Marks*

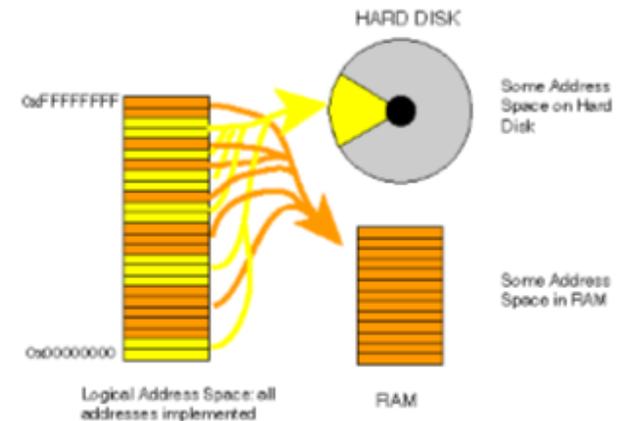
Yes it is because it is not a general purpose computer and it has a dedicated function which is **to tell the time**.



GCSE OCR Computer Science 1.2 Memory

Key Vocabulary

Volatile	Data is lost when there is no power to the storage
RAM	Random Access Memory—It stores currently running programs and a small piece of the operating system. Can store data
ROM	Read only memory— Holds the BIOS which allows the computer to boot up. It cannot be edited. Can store data.
BIOS	Basic input output system—Another name for the boot up sequence program.
Virtual Memory	Memory which is used when RAM is full. This is taken from secondary storage.
Disk Thrashing	Overusing the hard drive with virtual memory— which over time damages the disk.
Flash Memory (non-volatile)	Memory which retains data in the absence of power. USB drive.



Ram VS Rom

RAM	ROM
Volatile memory	Non-volatile memory
Stores data	Stores data
Stores running programs & part of the operating system	Used to store the BIOS and bootstrap
Memory can be written to or read from	Memory can only be read from and not written to



Have you applied?

Definitions **must** be applied to the scenario otherwise you will receive 0 marks.

Example: How can John increase the performance of his computer? (3)
 Answer: They could increase the number of cores, as this will increase parallel processing. He could also increase the RAM as this will allow more temporary storage for running programs and allow the processor more time to process data, and will reduce disk thrashing.

Secondary Storage

RAM

Cache Memory

CPU

The CPU will first search for data in the Cache memory and then move further away until it finds what it is looking for. The further away from the CPU, the longer data will take to transfer.



Flash Memory

USB is not accepted—it has to be USB drive; USB pen drive; Flash drive.

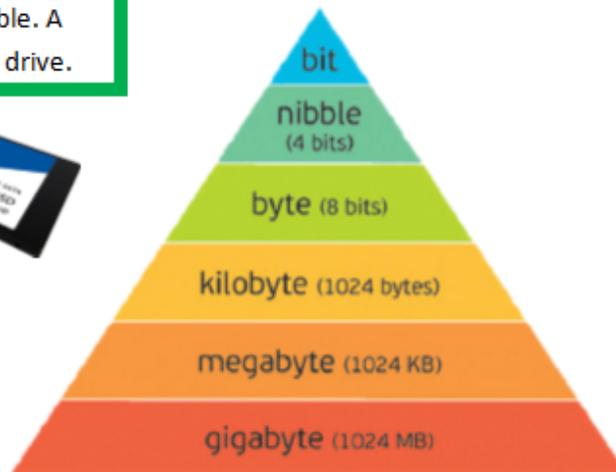
GCSE OCR Computer Science 1.3 Storage

Key Vocabulary

Secondary Storage	Storage which is not directly connected to the motherboard. Non-volatile. Needed to store persistent data.
Primary Storage	Storage which is connected to the motherboard.
Magnetic Storage	Storage which is cheap per MB; not very durable as it has moving parts, not very portable. A hard drive.
Optical Storage	Storage which is cheap per MB, not very durable as it can be damaged by scratches, is portable. A CD
Solid State Storage	Storage which is expensive per MB, very durable as they are shock resistant and have no moving parts., very portable. A USB drive, or a solid state drive.

Device	Capacity	Speed	Portability	Durability	Reliability	Cost
Magnetic	High > 1TB	Medium data access	Not very; it is not easy to move a hard drive	Not very durable, it has moving parts and is easy to break	Mid reliability due to moving parts being easy to break.	Cheap per MB
Optical	Low <1GB	Slow data access	Very portable. It's a disk	Not very, it is easy to scratch and snap	Mid reliability as it is fairly robust but can be damaged and prevents reading data	Very cheap per MB
Solid State	Medium <1TB	Fast data access	Very, solid state drives have no moving parts and are fairly small	Very durable, as they are just microchips on a board.	High—although they do have a limited number of read and writes	Very expensive per MB
Cloud Storage	Within reason unlimited	Dependant on network access speed	Very portable, as long as you have internet access	Very durable, can be accessed on any device with internet access	It is not possible to break cloud storage	Mid range expensive. Depends on how much space you have.

32 COMPUTING



Have you applied?

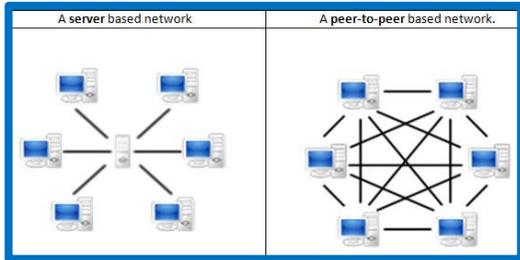
Definitions **must** be applied to the scenario otherwise you will receive 0 marks. **Here the photos have been mentioned.**

Example: John is transferring camera files from one computer to another. Discuss the advantages and disadvantages of using a flash drive.

Answer: A flash drive has high transfer speeds, and is very robust however has limited storage when compared to a hard drive, or cloud storage. So to move the photos I would recommend cloud storage.

GCSE OCR Computer Science: 1.4 Wired and Wireless Networks

Network Organisation	
Client – Server	One or more computers are designated as servers, providing a service to clients on a network.
Peer-to-peer	A distributed system where functionality can be divided among the nodes on the network. All computers have an equal status and may partially act as a server to other devices. Peers are both suppliers and users of network data and services.



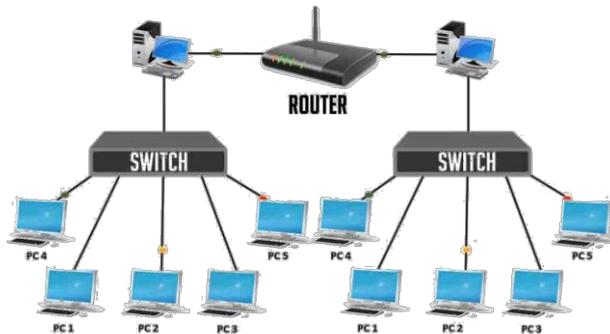
Key vocabulary	
Network	A collection of computer systems that are linked together and can share data.
Node	A device connected to a network via a link.
Links	The interface on which multiple devices can communicate. Such as a cable or wireless.
Client	A client is a piece of computer hardware or software that accesses a service made available by a server.
Server	A server is an instance of a computer program that accepts and responds to requests made by another program, known as a client.

Connection Type	
Ethernet	Sometimes called twisted copper pair – this is the “normal” cable you would use to connect a computer to a router. Speeds are up to 100 MB/s.
Coaxial	These contain a single solid copper centre cable. The most common use for these are for cable broadband, or satellite connections for Sky.
Fibre	Also known as fibre-optic cable. It contains lots of threads of glass which carry electrical impulses in the form of light. Speeds are measured in GB/s and are improving all the time.



33 COMPUTING

Network Scale	
LAN	A local Area Network. All devices are connected on one site. The network may be in a single building or campus. A small geographical area. Usually maintained by a group of network administrators.
WAN	A Wide Area Network. Covers a large geographical area, this could be cities or world-wide. Connections are provided by large companies such as Virgin or BT. The largest example of a WAN you use is the internet. Your mobile phone network is another example of a WAN.
VPN	A Virtual Private Network. Requires a username and password to access this network. It can be accessed anywhere in the world; and is generally secure and or an encrypted connection. It is not a physical network.



Routers Vs Switches	
Routers	If you have access to the internet in your house; you will have a router. It routes traffic around your network. It assigns IP addresses to all devices on the network, and knows all devices connected to the network. It can provide wireless and wired connections
Switches	Extends a network by allowing more devices to connect to it. This device uses MAC addresses to send packets around the network; it is not aware of how many devices are on the network. Usually wired only.

GCSE OCR Computer Science: 1.5 Network Topologies and Protocols

Protocols

Protocols are a set of rules which govern how data is transmitted around a network

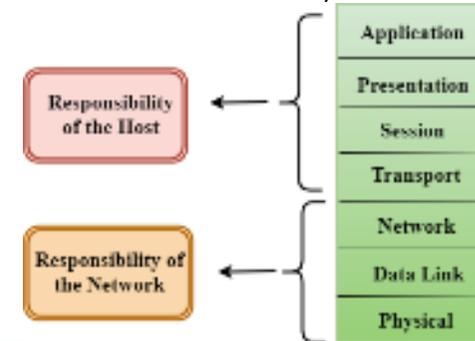
Protocol names and purposes

TCP/IP	Transmission Control Protocol / Internet Protocol	Provides a way for two routers to communicate without any errors. Involves packet switching.
HTTP	Hyper Text Transfer Protocol	Used to send and view webpages over the internet usually within a browser such as chrome.
HTTPS	Hyper Text Transfer Protocol Secure	Used to send and view secure webpages over the internet and to create a secure encrypted connection between the client and server.
FTP	File Transfer Protocol	Used when transmitting a file from a client to a server.
POP	Post Office Protocol	Used to download an email to your computer.
IMAP	Internet Messaging Application Protocol	Used to download an email to your computer.
SMTP	Simple Mail Transfer Protocol	Used to send an email from one mail server to another.

Layers

Layers exist so:

- A layer can be removed without affecting other layers
- Each layer has its' own purpose and is self-contained
- It does not need to consider the other layers
- Different layers interact with different hardware
- You do not need to know the layer names



Encryption

Uses an algorithm to jumble /scramble the data.
It cannot be understood without a key.
A specific key is used to decrypt it.

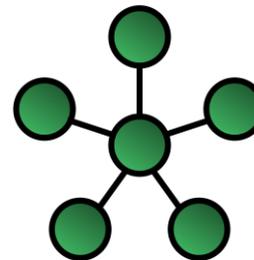
SAMPLE ENCRYPTION AND DECRYPTION PROCESS



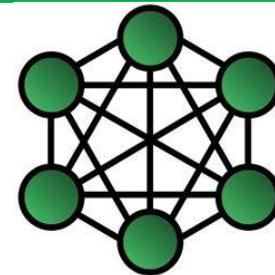
Network Topologies

Two exist you need to be able to draw / recognise:

Star



Mesh



Factors which affect network performance

Number of devices connected

Bandwidth available

Hardware specifications and types of cable

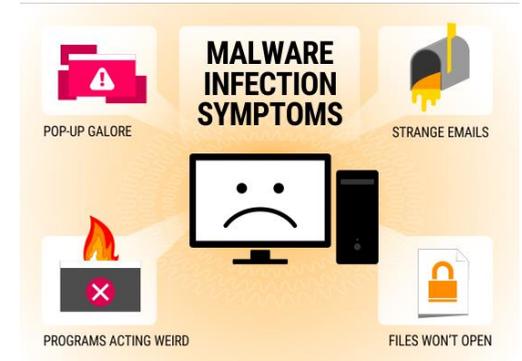
Wired or Wireless

Interference such as walls for wifi

GCSE OCR Computer Science: 1.6 System Security

Security Threats To Computer Systems

Threat	Explanation	How to prevent
Social Engineering / Phishing	This is where information is given freely usually over the phone or by email by someone pretending to be a company or someone else	Staff training and having appropriate spam filters on email inboxes.
Computer Virus	This is where a computer program is installed onto a computer which causes the data on the computer to be damaged.	Anti-virus software and scanning email attachment software.
Weak & default passwords	This is where passwords are left unchanged and potentially very easy to guess	Staff Training and Network Policy.
Brute Force Attack	This is where every possible combination of password is attempted to gain access to a system.	Limit the number of attempts at a password.
Malware	Short for Malicious Software. This is where software which looks genuine is installed and can be used to take control over the computer or cause it to malfunction.	Anti-Malware software Staff Training
Hacker	This is where an unauthorised internet user attempts to gain access to a computer system.	Firewall – which blocks unwanted incoming and outgoing connections to the internet.
SQL injection	This is where SQL structured Query Language is inserted into a website which can be used to damage the database running the website.	SQL sanitation and appropriate access rights on the database.



Types of malware

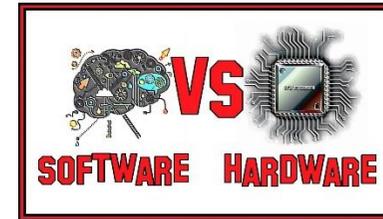


Identifying and Preventing Vulnerabilities

Threat	Explanation
Penetration Testing	This is where a computer system is tested to see if it can be "broken into" by a computer user in order to help identify weaknesses in the system
Network Forensics	This is where traffic on a network is closely monitored and captured in order to ascertain what data has been sent over a specific network. This could be restricted to a LAN or could include internet traffic (WAN) as well.
Network Policies	This is a set of rules which everyone who uses the network must abide by. These have to be built well and will outline the penalties of breaking the rules in place.
Firewalls	A piece of software used to block and incoming or outgoing connections to a computer system which could be harmful to it.
Anti-Virus	A piece of software which is used to scan for and remove viruses from a computer system.
User Access Levels	This is a security settings which prevents users at certain levels accessing information. Some Examples are: Standard User, Admin, Super Admin
Passwords	Need to be a set length, contain special characters, can contain two step verification

GCSE OCR Computer Science: 1.7 Systems Software

Hardware Vs Software	
Hardware	Is a physical part of a computer system and its related devices both internal and external. Anything you can “touch” is hardware; motherboard, RAM, monitors etc
Software	Term used to cover computer programs, most software falls into either an application, system or utility software.

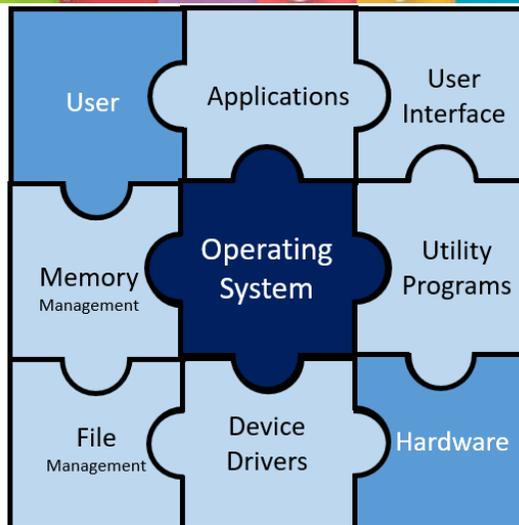


2 Types of Systems Software



Utility programs

Utility software helps maintain or configure a computer. Many of these are installed at the same time as the OS but they can also be added afterwards. Some examples are:



Utility Programs	
Disk defragmentation	Re-organises files on a hard drive to put fragments of files back together. This reduces the time needed for a disk head to locate data. You do not need to defragment a SSD; this will actually reduce their life expectancy.
Backup Software	Does what it says on the tin. It is used to take a copy of files to help prevent loss of data. Backups can be full or incremental. Full = everything backed up Incremental = only recently updated files are backed up
Encryption	Uses an algorithm to scramble text so that it is not understood; and requires a key to decrypt.
Compression Software	Reduces the size of a file so it takes up less disk space, and is quicker to download over the internet. Compressed files must be extracted before they can be read. Within sound Lossless – Is how youtube works! It can compress a file without losing any of the information and is reversible. Not all files can be compressed with this. Lossy – It can compress a file but will permanently lose some of the data. It can produce much smaller files than lossless.

Venues

- Small and medium sized venues
- Large multi-use venues
- Health and safety
 - Risk assessment – the process you go through to ensure an event is safe.
 - Capacity – maximum number of audience members
 - Fire precautions
 - Policies and procedures – that all venues should have
- Performance roles

Production and Promotion:

- Record labels
 - Major – sponsored and more money.
 - Independent – going it alone and on a budget.
- Music Publishing – anything involving the distribution of music to an audience.
- Promoting (marketing)
- Broadcasting – TV, Radio, Internet
- Marketing and distribution

Commonly Confused Job Roles:

Producer – have artistic overview of a project

Promoter – is responsible for advertising of a product.

Mastering Engineer – Puts the finishing touches to a recording once it is all finished.

Manager – NEVER write this without clarifying the type of manager (tour manager, venue manager, band manager etc.)

Music Unit 1

Unions

- Musicians Union (MU) – for performers, instrumental teachers and composers.
- Equity – For actors, dancers, and choreographers.
- BECTU (Broadcasting Entertainment Cinematograph and Theatre Union). – for media and production roles.
- Monitor employment conditions
- Give advice on employment and contracts
- Support in relation to fair working conditions
- Handling of disputes

Employment:

Freelance – working for yourself.

Contracted – Having a boss, a monthly salary, and terms to work to.

Short Term – a short amount of time (one gig or one day)

Long Term – months or years.

Tax / National Insurance – the amounts you have to pay to the government regardless of whether you are freelance or contracted.

Services, Companies, and Agencies

- Royalty Collection Agencies
 - Performing Rights Society (PRS) – collects for composers
 - Phonographic Performance Limited (PPL) – collects for performers
- Artist Representation
 - Management – deals with finances, bookings, organisation.
 - Agent – books gigs.
 - Public Relations (PR) – marketing.
 - Stylist
- Hire companies – for equipment.

Relationships within the industry:

- How promoters match acts to venue, e.g. location and type of venue, size and scale of performance area, facilities, technical equipment/support available, audience capacity, type and intention of performance, timing and availability, financial considerations
- The importance of effective communication between those working in the industry
- How promoters and musicians evaluate the advantages and disadvantages of hiring and buying equipment
- How promoters and musicians find and select suppliers and installers of equipment
- How trade bodies such as the Music Producers Guild (MPG), the Association of Professional Recording Services (APRS), PRS for Music and PLASA support their members and their industries
- How promoters and musicians find and select transport companies for touring
- How promoters secure funding for and market events.

Instrumental and Vocal Techniques

- Accuracy of pitch/intonation (*that you are playing in tune*)
- Rhythm and timing (*that you can play the correct patterns of notes in time with others*)
- Technical exercises to improve technique relevant to the voice type or instrument in question, e.g. scales and arpeggios, lip slurs and paradiddles (*these can be easily searched for on Youtube*).
- Expression (*musically expressing a story*) and dynamics (*volumes*)
- Phrasing (*like musical sentences and how well you express them*)
- Range (*from lowest to highest note*)
- Sight reading/singing
- Improvisation (*making a part up on the spot*)
- Breath control
- Vibrato (*when a note wobbles*)
- Confidence
- Tuning (*of your instrument*)
- Following an accompaniment (*following a backing track of the rest of the band*)
- Learning repertoire (*how well you learn the piece you are working on*)
- Musical interaction (*looking at and responding to others*)
- Stage presence (*performing bit!*)

Music Unit 5



Personal management skills

- Independent practice (*this is the practice you do outside of the lesson*)
- Attendance
- Time management (*adhering to rehearsal schedules*)
- Readiness to work (*including bringing correct equipment, if necessary*)
- Listening to instruction/direction
- Observing safe working practices
- Willingness to try things out
- Concentration and focus within the tasks
- Appropriate interaction with others – trust and cooperation
- Rehearsal discipline
- Showing sensitivity towards others

Interpretive skills

- Emphasis (*stressing a particular part*)
- Accurate interpretation and reproduction of style
- Awareness and appreciation of accompaniment
- Physical expression
- Communication in performance – with other musicians and the audience
- Use of timing and rhythm
- Intonation (*this is overall tuning*)
- Projection (*this is as much about noise as projecting an image on stage*)
- Focus (*commitment to the performance*)
- Musicality/sensitivity
- Stage presence.

Rehearsal skills

- Warm-ups
- Physical preparation, e.g. relaxation and breathing techniques and technical exercises (as appropriate)
- Learning repertoire
- Rehearsing with accompanist/band (as appropriate)
- Musical interaction with other performers (as appropriate)
- Receiving and giving constructive and positive feedback.



Music Unit 6

Equipment

- Computer
- Mixing desk
- Microphones suitable for a range of instruments and voices
- Auxiliary equipment, e.g. cables, stands, DI boxes
- Audio interfaces (*A piece of hardware that connects multiple microphones and instruments to a computer. They convert audio waves into digital files that can be recorded in a various qualities and bit rates electronically.*)
- Monitors and amplifiers (*the speakers and things that make it louder*)
- Headphones
- The recording environment. (*studio*)
- Phantom Power (A power source for condenser microphones, it's voltage is 48v. Phantom Power can be applied to mics through XLR cables and the option to add it is normally found on a respective channel on mixers, interfaces and DI boxes.)

Session considerations

- Scheduling
- Availability of equipment that may need to be hired
- Availability of musicians who may need to be hired (session musicians)
- Technical resources, cables, mics and stands
- Space
- Line of sight if a conductor is being used
- Headphones and monitoring
- Noise, both in and outside the studio
- Health and safety considerations
 - Setting up a health and safety routine/checklist
 - Briefing session musicians and guests as to the rules and regulations
 - Being aware of fire and access/exit procedures
 - Setting up
 - Monitoring levels
 - Manual handling, electrical safety

Audio Recording

- Audio capture
 - Microphone types, qualities and uses, e.g. condenser, dynamic, mics for specific uses such as bass drum mic, vocal mics, use of phantom power etc
 - Condenser mic - Requires power from a battery or an external source (phantom power) to turn acoustic energy into an electronic signal, the results is more detailed. Condensers are normally more delicate.
 - Dynamic mic - Dynamic Microphones do not need external power, they generate an electronic signal with an internal electromagnet. Dynamic microphones are normally a lot more robust and are typically used for close micing and/or live performances.
 - Microphone placement
 - DI (*DI stands for Direct Injection and it is used to connect instruments **not** microphones to a mixing console. Instruments have varying signal strengths and a DI box is used to balance the level.)*)
 - Line and mic levels
- Auxiliary equipment
 - Mic stands and leads
 - Pop shields
 - Audio interface
- Equipment storage and handling
- Safe procedures
- Computer operation
- Audio capture process and procedures
- Record level, distortion, noise
 - Routing
 - Monitoring
 - Troubleshooting
 - Project management, e.g. file management, backing up, takes
 - Session management, e.g. time management, organisation

Mixing the Multi-track

- Audio editing, e.g. trimming, take selection
- Levels
- Stereo field - in regards to speakers or monitors means more than one from one source. In regards to electronic instruments, a stereo feed means the devices output has two channels of audio which represent the sound of the real instrument it's in the stereo field more effectively. In mixing it could be how you pan each channel to balance them and to place them in a realistic position.
- EQ (*used in the mixing stage to add or take away frequencies, it is used to balance mixes*)
- Effects, e.g. reverb, compression
- Bouncing down to stereo.
- Phasing (*Phasing is the result of two or more signals being out of time with each other.*)

Konstantin Stanislavski

1863-1938

Theatre Practitioner



Co-founder of the Moscow Art Theatre.

Created a **system** of preparation and rehearsal that allowed actors to perform in a **naturalistic** style.

He was interested in creating emotion on stage that seemed real.

Components of the system

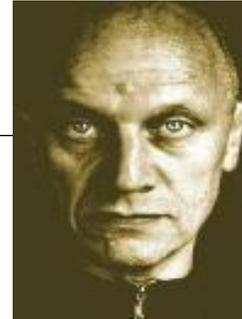
- Emotion memory: When an actor tries to remember a moment in their life when they felt something and recreate this moment as their character.
- Units and objectives. Exploring a character through their various motivations.
- Super objective: The main thing a character hopes to achieve.
- Given circumstances: All the things we know about the character and their situation from the text
- Tempo-rhythm: The inner emotion of a character represented by a rhythm.
- Through line of action: Always knowing what your character was doing before they enter the stage.
- Famous for directing Chekov's plays such as: *The Cherry Orchard*, *Uncle Vanya* and *Three Sisters*.
- Wrote three books: *Building a Character*, *An Actor prepares* and *my Life in Art*

Btec: Performing Arts – Acting
Component 1 - Exploring the Performing Arts

Steven Berkoff

Born in London in 1937

Playwright, Director, Actor



- Theatrical style: Total Theatre, Physical theatre. Berkoff's style of performance is grotesque and vulgar but at the same time poetic.
- It has the intention of disturbing its audience and making them feel uncomfortable.
- Every line must have a choreographed movement that adds to the mood of the performance.
- He mixes exaggerated mime and exaggerated facial expressions with heightened language.
- He regularly uses repetition of Physical Motifs to show the essence of a character.
- Performances regularly use an ensemble cast and actors can be used as part of the set or performing movements in the background.
- Characters regularly directly address the audience, breaking the fourth wall.
- Mixes 'Shakespearean' style rhyming couplets with Cockney slang and swearing.
- Famous productions: *Metamorphosis*, *The Trial*, *East, West*, *Sink the Belgrano* and *Decadence*.
- Has also been a Bond villain!

John Godber

Born in Yorkshire in 1956

Playwright



His theatrical style non-naturalistic and influenced by Bertold Brecht and Shakespeare.

- Fast-paced action, short scenes, minimal props and staging.
- John Godber has an eclectic dramatic style as he combines influences from his own experiences as a teacher and from popular TV entertainment.
- Easily identifiable and familiar working-class perspective of characters, locations and situations.
- His works often explore the conflict between aspirations and the limited opportunities for the characters.
- Each play is based around performers who multi-role.
- He uses a wide range of social stereotypes who have typical language and a set physical manner.
- Famous Plays: *Bouncers*, *Shakers*, *Teachers* and *Up 'n' Under*

Common Drama Devising Techniques:

Improvisation – where you devise drama on the spot based upon a stimulus.

Still Image – a frozen portrait.

Thought Tracking – Characters speak aloud from a still image.

Hot seating – Questioning an actor who is improvising answers in character.

Marking the moment – Using a particular style or difference to make a significant moment stand out.

Cross-cutting – 2 or more scenes that are scheduled for the same time happening on stage at once but alternating which one is ‘alive’.

Flash back / Flash forward – A moment in which you show what happened in the past or the future.

Montage – A sequence of images, or short sections, showing progression over time. Usually to music.

Movement sequence – a pattern of movements repeated with no speech.

Mime – Acting without speaking in an exaggerated way.

Soundscape – Using your mouths and bodies to create a wall of sound to represent a setting or atmosphere.

Story telling – using various states of narration, direct address, tones of voice, volumes, pacing etc. to tell a story.

BTEC Performing Arts - Drama

Component 3

Performance Skills:

Facial expressions – using your face to convey emotion.

Gesture – using your body to help emphasise speech and emotion.

Posture – the way you hold your body to convey character.

Levels – the different heights you use to show emotion, power, or authority.

Proxemics – the spacing between characters to show the relationship between them.

Positioning – the placing of characters on stage to show relationships, power, and emotion.

Projection – how well you project your character to the audience. OR. How loudly you speak.

Volume – the loudness of your voice.

Pace – How quickly you move when conveying a character.

Tone – The way you use your voice to convey emotion. For example, angry or happy.

Pitch – how high or low you use your voice.

Pause – the use of pauses in speech and movement.

Types of Structure:

Linear/Chronological Structure – this is a structure that follows events in the order that they happen.

Non-linear – This is a structure that chops and changes between times, locations, and sometimes stories.

Useful vocabulary and tips:

You only have 600 words to write each section of your log so you need to be succinct. Try using these phrases:

‘about’ – instead of ‘in terms of’.

‘because/since’ – instead of ‘the fact that’

‘to’ – instead of ‘in order to’

‘importantly’ – instead of ‘it is important that’

- Don't go into detail about your plot.
- Keep it about how you have met the brief.
- Try to keep adjectives to an essential minimum.
- Remember to discuss ideas you rejected as well as ones you went with.
- Remember your target audience and purpose.
- Prepare your notes well before you enter the assessment.

Btec: Performing Arts – Acting

Component 2 - Developing Skills and Techniques in the Performing Arts

Acting Skills Physical:

- **Gesture:** Using your body (usually arms and hands) to communicate.
- **Posture:** the position of your upper body
- **Stance:** how you stand
- **Gait:** The way in which your character walks
- **Facial Expression:** Showing your character's emotions and thoughts using your face.
- **Body Language:** Using your body to communicate subtext to an audience
- **Proxemics:** spacing on stage. Where you are can communicate a lot to your audience

Mobile Phone Show by Jim Cartwright is a play that explores our relationship with mobile phones through the stories of a number of different characters.

KEY FEATURES:

- It uses an **Ensemble** cast, with no stars of the show every actor contributes.
- **Multirole acting** means that all actors will have to switch quickly from one role to another.
- **Gestus:** A way of acting that immediately shows the essence of the character including their attitude and position in society.
- The play is **Episodic** this means the scenes are only linked together by theme rather than following the same characters through a story.
- The play makes a comment on society and encourages the audience to think about something that they may take for granted.

General Rehearsal and development process:

- **Casting:** Deciding who has what lines
- **Read Through:** Familiarise yourself with the script and your lines
- **Blocking:** Deciding where are positioned on stage and when they move
- **Line learning:** It is important to learn lines early on to focus on the physical and vocal skills

Many of the key features of this play are similar to Brecht's Epic Theatre so you need to be aware of some of Brecht's rehearsal techniques that can help you develop the style of the performance.

- Putting the text into third person. As you act out a scene, describe what is happening including saying 'he said' or 'she said' after every line.
- Rehearsing a scene in silence: once you have blocked a scene and practiced it with the lines, act out the same scene with no words, focusing on refining your physical skills.
- Reporting the story, imagine you had just witnessed the scene you are rehearsing. How would you explain it to someone who had never seen it?
- Developing the Gestus for a character: Think of how your physical skills can be used to show your character's position in society and function in the story.

Acting Skills: Vocal

Tone: The emotional quality of your voice

Pitch: Whether your voice is high or low

Pace: The speed and rhythm that you talk at.

Pause: Deliberate gap in speech.

Volume: How loudly or quietly you speak.

Projection: Making sure your voice can be heard without straining it.

Emphasis: Making certain words stand out from the others.

Accent: A pattern of speech that can determine where your character is from and their social class.

Clarity: Ensuring you are clear and your audience can understand you.

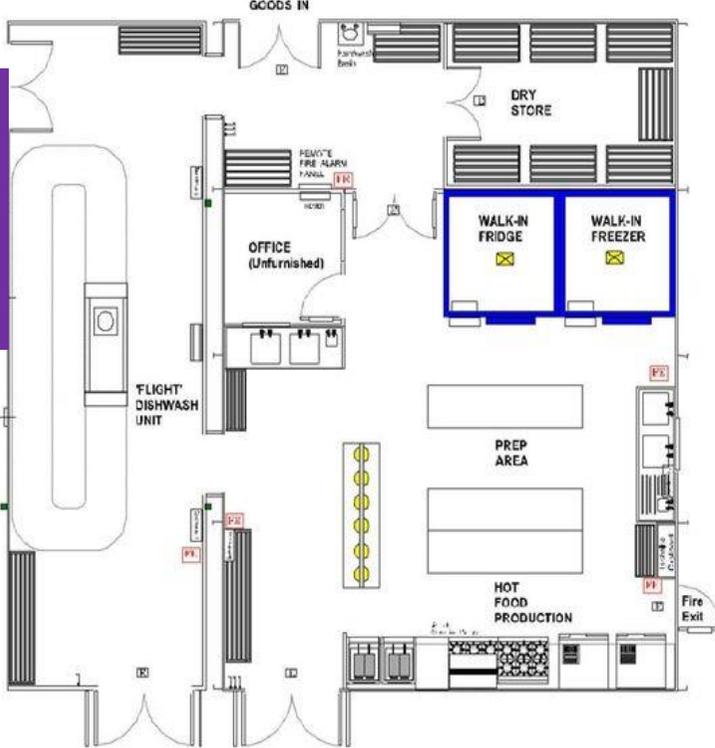
Cooking Skills Key words: accompaniment, main course/dessert, portion control, food waste, presentation techniques, coulis, gelatine, garnish, glaze, pipe.

Knowledge Key words:

Kitchen operation: layout work, workflow, operational activities, equipment and materials, stock control, documentation and administration, staff allocations, dress code, safety and security.

Personal safety in the workplace: employer/employee, health & safety at work act, RIDDOR, COSHH, manual handling, PPE, health, security level of risk to employees, suppliers and customers.

Kitchen Layout and Workflow



Unit: Hospitality and Catering

Commercial Catering Equipment



Workplace Legislation:
 Food Safety Act 1990
 HACCP
 Food Safety regulations (1995)
 Food labelling regulations (2006)
 Fair Trade & description standards
 H&S at Work Act (1974)
 HSE

What is HACCP?
 Hazard Analysis Critical Control Point



An internationally recognized system for reducing the risk of safety hazards in food



First in First out – stock control, to reduce waste and poor food hygiene standards

Safety in the Workplace

RIDDOR – Reporting of injuries, disease and dangerous occurrences regulations

COSHH – Control of Substances Hazardous to Health



EPOS – Electronic Point of Sale (food)



Dress C



1. White skull cap
2. Chef's jacket
3. Checkered chef's pants,
4. White apron and/or apron
5. Leather clogs non-slip with closed backs.

Kitchen)/Front of



Women can wear a skirt or trouser suit with heels
 While men may wear a blazer or suit jacket, shirt, suit trousers, tie

Unit 4 – Common Specialist Technical Principles

- Key vocabulary**
- Resistant
 - Perpendicular
 - Stiffness
 - Twisting
 - Similarities
 - Difference
 - Functionality
 - CNC Router
 - Robotics
 - Renewable
 - Finite
 - Non-finite

Forces & Stresses

Tension Compression Torsion Bending Shear

Static and Dynamic Loads

Acceleration

A static load does not move and will exert far less stress than a dynamic load

Force = Mass X Acceleration

Improving Functionality

Materials can be reinforced, stiffened or made more flexible

Techniques include:

- Folding
- Bending
- Webbing
- Lamination
- Fabric interfacing

Lamination – Plywood

Involves bonding 2 or more layers together.

Fabric Interfacing

Fabric Interfacing is added to textile products to make them more rigid.

- Key vocabulary**
- Enhanced
 - Rigidity
 - Jigs
 - Patterns
 - Templates
 - 3D Printing
 - Automation
 - Laser Cutting
 - Injection Moulding
 - Handmade
 - Sustainable

Ecological & Social Footprint

Global Emissions

The Greenhouse Effect

Mining

Drilling

Deforestation

Farming

The 6 Rs

Tertiary Recycling – reprocessing material from a product e.g. pulping paper & card.

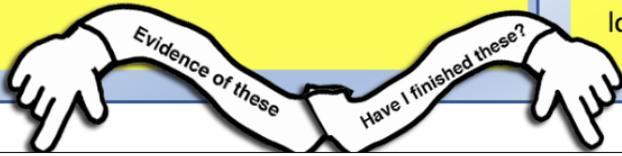
Upcycling – products are diverted from landfill and reduce the demand on new products.

Scales of Production

- One off Production
- Batch Production
- Mass Production
- Continuous Production
- Prototypes & 3D Printing

This GCSE is about **presenting visual and written evidence** of my personal investigation on this topic. I don't need to memorise or revise, I just need to **produce, make and connect** my ideas using the visual language.

- No evidence = no marks
- A little evidence = a few marks
- I do what teacher says= grade 4
- I lead, I know what I want to do and I get on with it producing lots of evidence= top marks



Independent tasks and HW.
Do a lot of these:

Year 11. **Art and Design, Textiles, Photo.**
Externally Set Assignment: see the exam paper.
My EXAM theme is:



1

I do research to know the work of artists, world cultures and styles. My chosen artists have worked on a theme similar to mine. I use this knowledge to inspire my creative work. I have proof of my **critical understanding** in my book.

Artists pages, including:

- Copies of artists' work
- **Description of work- ***
- **Explanation of how it's put together and what it means ****
- **My research making contextual links*****

Look closely at the work of artists that respond to the same theme, or that use the theme in their work. **Describe it** with your best words and writing style.*. **Draw a diagram** of its layout and add notes. **Explain** what the art piece makes you see and feel as a viewer. Use your best writing.** **Explain** how it responds to the theme, inspiring your project.

Elements: Line, Shape, Form, Tone, Texture, Colour, Pattern.

Principles of composition: Unity, Balance, Contrast, Harmony, Scale, Movement, Emphasis.

2

I prove that I can make visual work. I prove that I can also **refine** my work to make it more meaningful to the theme. I show off what I do well. I can also experiment and take risks trying new ways of mixing **techniques** and

Test pieces:

- My personal response to artists' work
 - My mixing of two artists' styles
- Refined test pieces:
- two solutions for each test piece using techniques learnt since yr 7

Draw as much as you can, choose any scenes, items, figures or actions that link to the theme. **Draw it again** from different angles, be experimental, show off your shading and composition skills. **Take purposeful photos**, print them out or send them to your teacher

-**Creative investigation**: my project.

-**Critical understanding**: I can explain the ideas carried by a work of art. -**To speculate**: to explain something without being 100% sure. -***I see **I think ***I wonder**

-**Contextual links**: I can explain the historical, political and cultural circumstances in which a work of art is created or used.

-**Composition**: the layout, it uses the principles of art to carry meaning.

-**My personal response to a work of art**: I use the artist's technique and/or visual language, but using my own images as starting point.

-**To convey meaning**: to communicate. -**A technique**: a way to do something. -**A process**: a sequence of techniques. -**To refine**: to change something in order to improve it.

3

I can spot how things could link to my project. I **record** those using cameras and drawing. Nobody else sees and feels like I do. As an artist I pick what I focus on and my ideas allow me to link these items together with new meaning.

- photo shoots
- drawings
- notes: my links, descriptions and ideas

4

I can produce and **present** a visual solution to the "Theme". This is my **final piece** for the project. It conveys my ideas, my connections and my investigations.

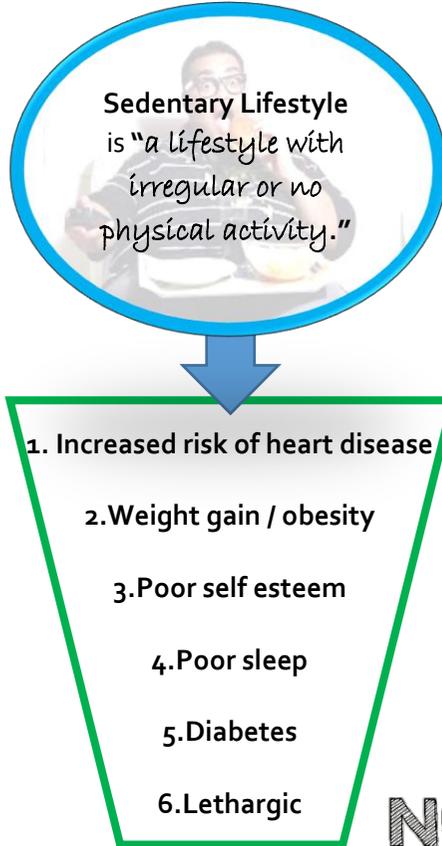
- my final piece
- my whole investigation is well presented and easy to follow in my book
- my final piece /project evaluation

This project is your opportunity to shine, be bold and use techniques that you have controlled and have enjoyed using confidently. You must have at least 2 different techniques or processes.

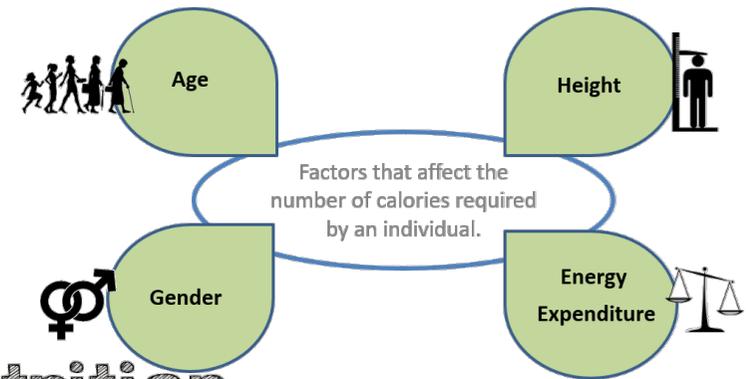
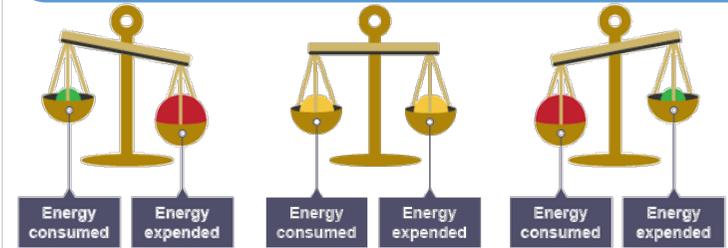
isastre@iscaexeter.co.uk

Health, Fitness and Well-being

Health	A state of complete mental, physical and social well-being, and not merely, the absence of disease or infirmity
Physical Health	All body systems work, free from illness and injury. Ability to carry out everyday tasks
Mental Health	A state of mental well-being in which the person realises their own potential, can cope with normal stressful life, work productively, and able to contribute to their community
Social Health	Basic human needs met. The individual has friendship and support, some value in society, socially active and has little stress in social circumstances.
Fitness	The ability to meet/cope with the demands of the environment

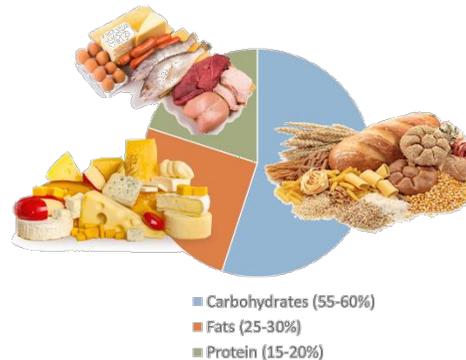


Energy is measured in calories (Kcal) and is provided through the food we eat. The average male requires 2500 Kcal per day and females 2000.



Nutrition

"A balanced diet contains lots of different types of food to provide the suitable nutrients, vitamins and minerals we require."



Protein	Used for repair and growth of muscles
Carbohydrates	Primary source of long lasting energy
Fats	Fast Energy. Secondary form of energy when carbohydrates run out
Water	Key to staying hydrated
Vitamins & Minerals	General health of the body including blood, hair, skin and nails



NCFE Health and Fitness

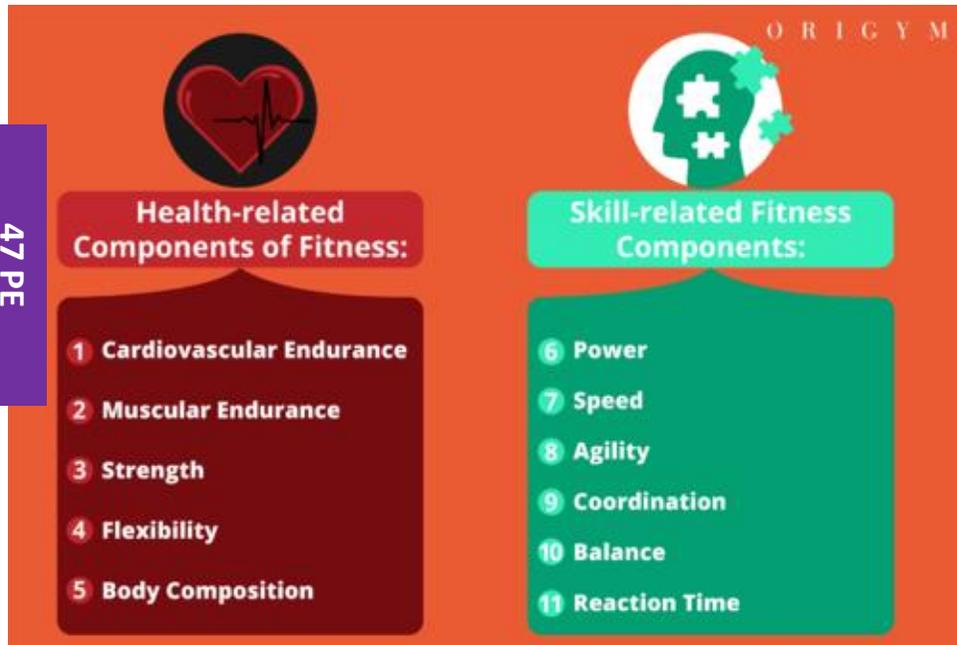
Health and Fitness Key Terms

Health: A state of complete **physical, mental** and **social wellbeing** and not merely the absence of disease or infirmity.

Fitness: The ability to cope with **daily demands without** suffering **undue fatigue**. As a person gets fitter they can cope with daily demands more easily.

Component of Health Related Fitness	Definition	Sporting Example
Cardiovascular Endurance	The ability of the heart and lungs to supply oxygen to working muscles.	Used by marathon runners to keep the body working aerobically.
Flexibility	The range of movement possible at a joint.	When a gymnast performs a specific move e.g. splits.
Muscular Endurance	The ability of a muscle or muscle group to undergo repeated contractions avoiding fatigue.	For example in badminton to keep moving around the court for the whole game.
Muscular Strength	The ability to overcome a resistance. Static, Dynamic and Explosive	Static strength is used by rugby players in a scrum.
Body Composition	A comparison of the percentage of bone, fat, water and muscle within the body.	Certain body compositions may provide advantages e.g. high jumper – better to be tall and thin.

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The relationship between Health and Fitness

- Having a high level of fitness does not necessarily mean you are healthy.
- Poor mental health may result in overtraining to try to achieve higher levels of fitness.

Component of Skill Related Fitness	Definition	Sporting Example
Agility	The ability to move and change direction quickly whilst maintaining control.	In badminton to change direction at speed to intercept an opponent's shot.
Balance	Maintenance of centre of mass over base of support.	Handstand position in gymnastics.
Co-ordination	The ability to use two or more parts of the body together smoothly/efficiently.	Tennis to move feet and swing racket to hit ball.
Power	Strength X Speed	Needed to punch with force in boxing.
Reaction Time	The time taken to initiate a response to a stimulus.	100m sprinter reacting to sound of gun.
Speed	Maximum rate at which an individual is able to perform a movement.	Needed when running the 200m.

We would always encourage you to speak to the people you live with or someone in school if you have a worry or a problem. If you can't, or you want to read more about an issue affecting you or someone you know, here are some useful websites and phone numbers. They offer free, confidential advice and support.



General
Childline—www.childline.org
0800 1111

Offers information and advice, 1-2-1 confidential chat (text, email, phone) and support from message boards on a wide range of issues.

This website is one of the most useful you will find and can direct you to help or information about all the other topics mentioned here, and



Health
School nurse—07520 631722
Text only for confidential advice
National Health Service—www.nhs.uk
Research and useful information on health issues
Walk-In Centre, RD&E Hospital—01392 411611
Non-urgent and sexual health needs
Walk-In Centre, 31 Sidwell Street—01392 276892



Mental Health and well-being
Samaritans—www.samaritans.org
Call 116 123 for emergency help
Email jo@samaritans.org (response within 24 hours)
Papyrus—papyrus-uk.org 0800 068 41 41
Urgent help for you or someone you know
YoungMinds—youngminds.org.uk
Text YM to 85258 for urgent help
Happy Maps—www.happymaps.co.uk
Advice on everything from sleep problems to anxiety, bullying, self-harm, coping with divorce, autism, ADHD, gender dysphoria and more

Safety, bullying and abuse

Child Exploitation and Online Protection (CEOP) - www.ceop.police.uk

Report inappropriate online contact, any unlawful misuse of social media, or a child protection concern to a trained police officer. You can also click this button on your platform:



NSPCC—www.nspcc.org.uk 0800 1111
Information and help about on- and offline abuse

National Bullying Helpline—www.nationalbullyinghelpline.co.uk 0845 22 55 787
Advice and help about bullying on- and offline



Healthy relationships
Thinkuknow—www.thinkuknow.co.uk
Age-related help and advice about on- and offline relationships and consent.



Drugs and alcohol
YSmart—ysmart.org.uk 01271 388162
Information about substance misuse, advice, recovery and treatment



LGBT
X-PLORE—www.lgbtqyouthdevon.org.uk
Local support and groups for LGBTQ young people

Homeless, skills, advice, getting your voice heard
Young Devon—www.youngdevon.org 01392 331 666

If someone's life is at risk, you should always dial
999