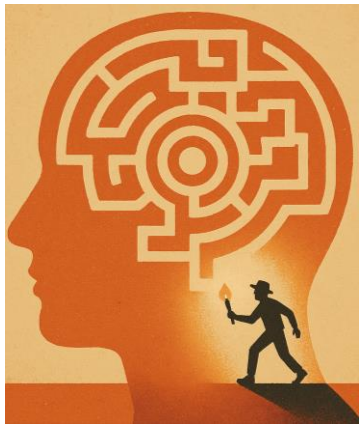
YEAR 10



BHA's Knowledge Quest

Autumn 1
(Sept - Oct)
2025-2026

Bristnall Hall Academy

How to use your

Knowledge Quest Booklet

To support you in making progress in each of your lessons, your teachers have produced Knowledge Organisers which contain all of the main facts, knowledge and information that you need to know to be successful and make progress this half term. There are lots of ways to use these Knowledge Organisers, but the most important thing is that you are revising the knowledge and you are able to recall it in your lessons. Please see below details of how to use this booklet; what your half termly homework looks like and how to secure lots of positive Class Charts points!

English: 1 Seneca assignment set per week (alternating between Language and Literature). Sparx Reader will be used to accompany the reading of Literature set texts. Additional revision may be provided by individual class teachers.

Maths: 1 hour of Sparx Maths, individualised homework set every week. Pinpoint booklets provided following assessments and additional revision provided by class teacher, where appropriate.

Science: 1 hour of Sparx Science homework, set every week.

MFL: 1 hour of vocabulary / listening / reading practice on Language Nut, every week and 30 minutes of learning vocabulary, ready to be quizzed in the following lesson.
History: 1 hour Seneca assignment set by class teacher, every week. Recap content using Knowledge Organiser and, when provided, complete practice exam questions.
Geography: 1 hour Seneca, each week. 1 x Core vocabulary booklet, using OMG revision across the year.
DT: Seneca - core knowledge recap, as well as flip learning resources, both printed and or on teams. Hospitality and Catering: Yr 11- revision workbook, revision tasks set on Teams. Re-cap content using Knowledge Organiser. Online 3D CAD program Year 10 term 1

Art: To complete/refine work for portfolio or set task projects when required.

Computing: 1 hour of Smart Revise. Individualised homework set weekly, based around previously taught topics and current topics.

Film Studies: The 15 or 10 marks 'Explore' exam question which focuses on an aspect of film language.

Sociology: 30 minutes of Senneca homework per week or an exam style question.

All other subjects: Revise the information in this booklet using the revision sheets included with each subject.

Timetable

Use this page to copy out your lessons and room numbers

	W1 Mon	W1 Tues	W1 Wed	W1 Thurs	W1 Fri	W2 Mon	W2 Tues	W2 Wed	W2 Thurs	W2 Fri
1										
2										
3										
4										
5										
6										

Dates to remember this half term:

September

October

Attendance record

Term	Attendance %
Autumn 1	
Autumn 2	
Spring 1	
Spring 2	
Summer 1	
Summer 2	

Sparx Check!

Remember to click: 'Login with Microsoft' using your academy email address and password!

In the boxes below, write the XRP score that you achieved for each subject. Your form tutor will award you additional CC points for the more XRP points you achieve in addition to the set points for each weekly homework.

	Sparx Reader Points:	Sparx Maths Points:	Sparx Science Points:
Week 1			
Week 2			
Week 3			
Week 4			
Week 5			
Week 6			
Week 7			
Week 8			
Total this half term:			

Seneca Check!

Remember to click: 'Login with Microsoft' using your academy email address and password!

In the boxes below, write the titles of the assignments that you complete for each subject and your overall percentage scores. Your form tutor will award you additional CC points for the highest percentages you achieve in addition to the set points for each weekly homework.

	English Assignments:	History Assignments:	Geography Assignments:
Week 1			
Week 2			
Week 3			
Week 4			
Week 5			
Week 6			
Week 7			
Week 8			
Total assignments completed this half term:			

Language Nut Check!

Remember to click: 'Login with Microsoft' using your academy email address and password!

In the boxes below, write out how many points you have achieved from your weekly homework. Your form tutor will award you additional CC points for the highest scores you achieve in addition to the set points for each weekly homework.

	MFL Homework:
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	
Week 8	
Total assignments completed this half term:	

Independent Study Check!

Your form tutor and your parent/carer will also check that you are completing your independent study within this booklet. Additional positive CC points will be awarded for beautiful presentation and your ability to demonstrate a strong recall of the knowledge within this booklet.

	End of Half term Form Tutor Check:	**Parent/Carer Check:**
Independent Study Completed?		
Beautiful Presentation?		
Recall of Knowledge?		

Personal Reflection: What are you most proud of within your Independent Study Booklet?

_____

_____

_____

_____

_____

Homework Log

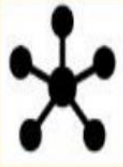
Use this page to record any homework this half term

Subject	**Date Due:**	**Additional Notes:**

Homework Log

Use this page to record any homework this half term

Subject	**Date Due:**	**Additional Notes:**

	Look, Cover, Write, Check	Definitions to Key Words	Flash Cards	Self Quizzing	Mind Maps	Paired Retrieval
Step 1	Look at and study a specific area of your knowledge organiser. 	Write down the key words and definitions. 	Use your knowledge organiser to condense and write down key facts and or information on your flash cards. 	Use your knowledge organiser to create a mini quiz. Write down questions using your knowledge organiser. 	Create a mind map with all the information you can remember from your knowledge organiser. 	Ask a partner or family member to have the knowledge organiser or flash cards in their hands. 
Step 2	Cover or flip the knowledge organiser over and write down everything you remember. 	Try not to use your knowledge organiser to help you 	Add pictures to help support. Then self quiz yourself using the flash cards.. You can write questions on one side and answers on the other. 	Answer the questions and remember to use full sentences. 	Check your knowledge organiser to see if there were any mistakes with the information you have made. 	They can test you by asking you questions on different sections of your knowledge organiser. 
Step 3	Check what you have written down. Correct any mistakes in green pen and add anything you missed. Repeat. 	Use your green pen to check your work. 	Use a parent/carer or friend to help quiz you on the knowledge. 	You can also use family to help quiz you. Keep self quizzing until you get all questions correct. 	Try to make connections that links information together. 	Write down your answers. 


WORLD MAP
1. Netherlands
2. Belgium
3. Luxembourg
4. Switzerland
5. Slovenia
6. Croatia
7. Bosnia and Herzegovina
8. Czechia
9. Slovakia
10. Austria
11. Hungary
12. Serbia
13. Moldova
14. North Macedonia
15. Albania
16. Cyprus
17. Lebanon
18. Guinea-Bissau
19. Guinea
20. Ghana
21. Togo
22. Benin
23. Cameroon
24. Equatorial Guinea
25. Rwanda
26. Cambodia
27. Panama
28. Malawi
29. Liechtenstein
30. Montenegro
31. Kosovo
32. Palestinian Territories
33. St. Vincent & the Grenadines
0 2,000 4,000 Miles
0 2,000 4,000 6,000 8,000 Kilometers
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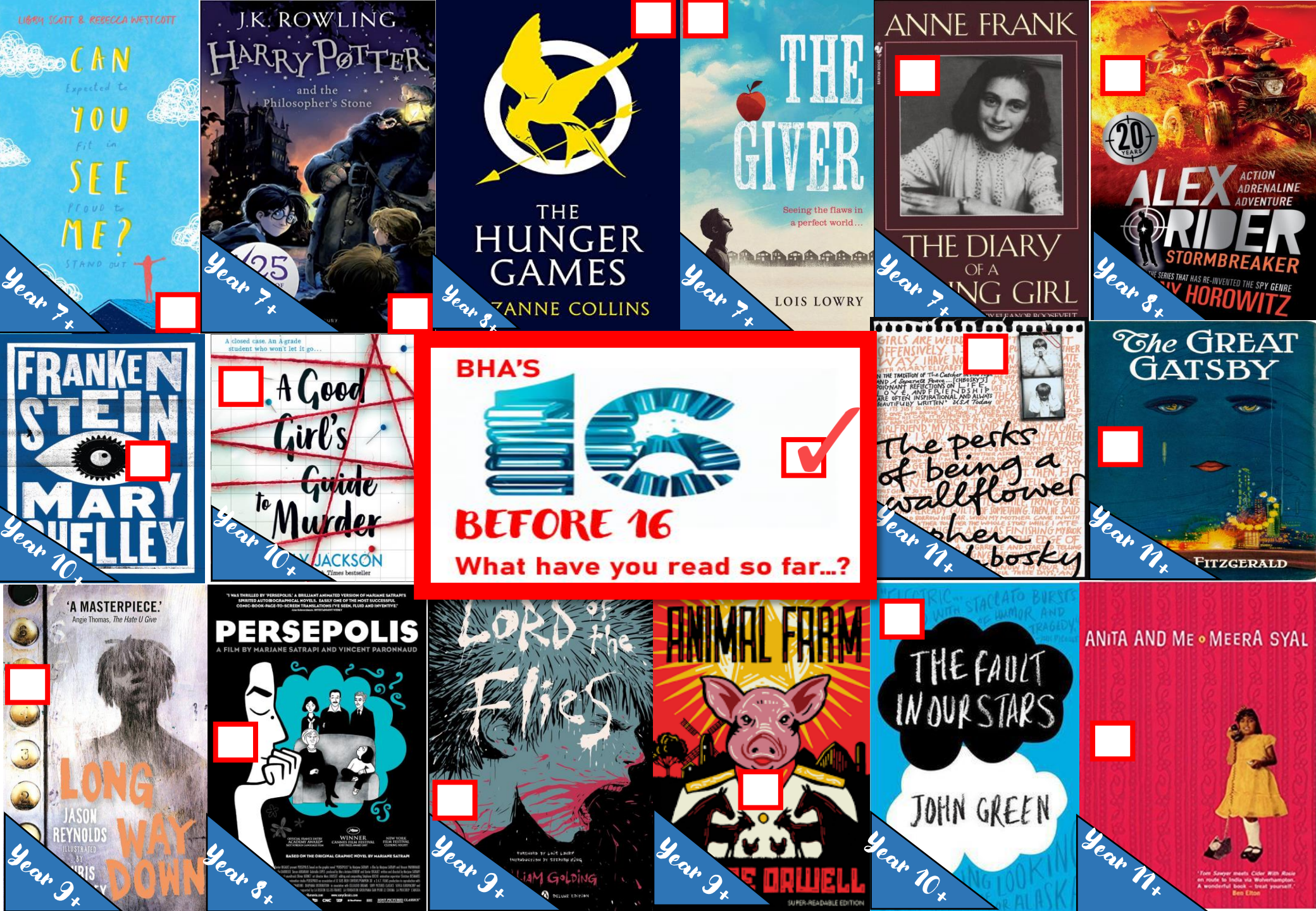
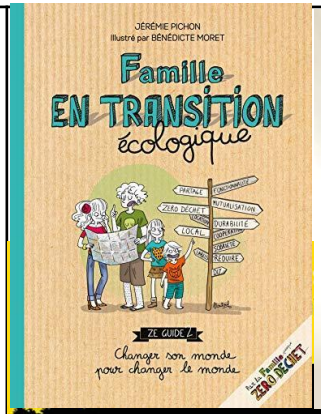

CAN YOU SEE ME?
Year 7+
J.K. ROWLING
HARRY POTTER and the Philosopher's Stone
Year 7+
THE HUNGER GAMES
Year 8+
THE GIVER
Seeing the flaws in a perfect world...
LOIS LOWRY
Year 7+
ANNE FRANK
THE DIARY OF A YOUNG GIRL
Year 7+
20 YEARS
ALEX RIDER
ACTION ADRENALINE ADVENTURE
STORMBREAKER
Year 8+
FRANKENSTEIN
MARY SHELLEY
Year 10+
A closed case. An A grade student who won't let it go...
A Good Girl's Guide to Murder
Year 10+
BHA'S
BEFORE 16
What have you read so far...?
The perks of being a wallflower
Year 11+
The GREAT GATSBY
FITZGERALD
Year 11+
'A MASTERPIECE.'
Angie Thomas, The Hate U Give
LONG WAY DOWN
JASON REYNOLDS
Year 9+
PERSEPOLIS
A FILM BY MARJANE SATRAPI AND VINCENT PARONNAUD
Year 8+
LORD of the Flies
Year 9+
ANIMAL FARM
Year 9+
THE FAULT IN OUR STARS
JOHN GREEN
Year 10+
ANITA AND ME • MEERA SYAL
Year 11+

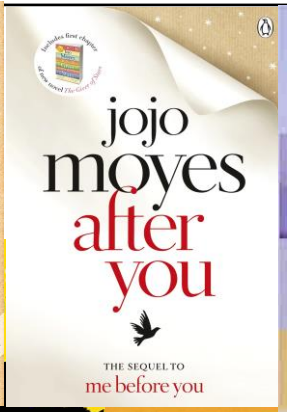
Contents page

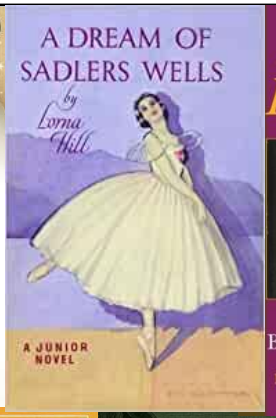
Further Reading List

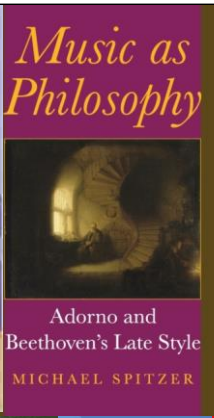
Year 10

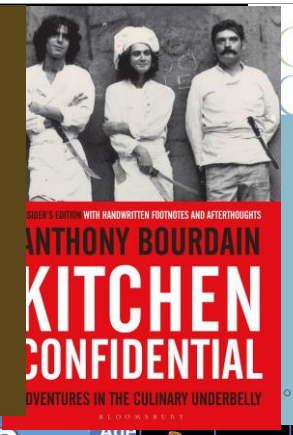
Challenge yourself by reading these topic-related books!

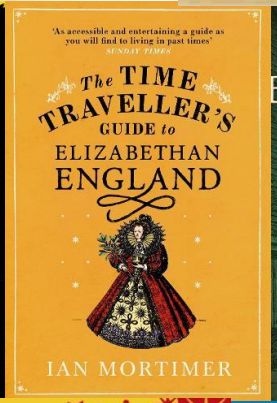


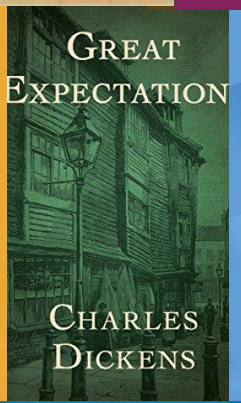


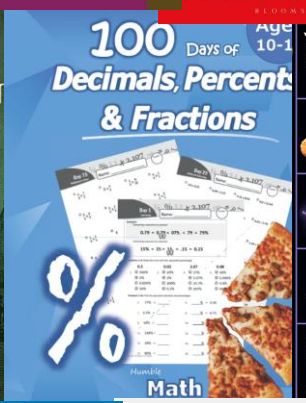


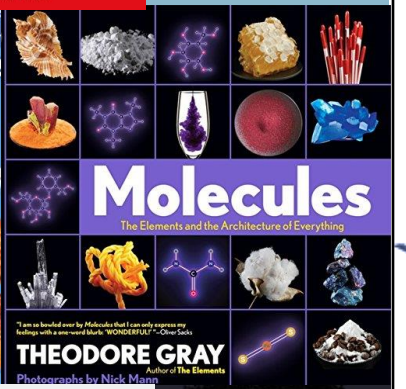


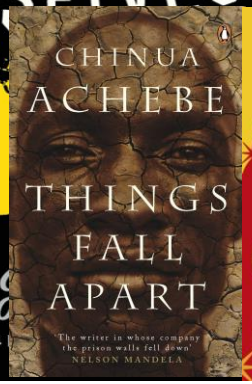


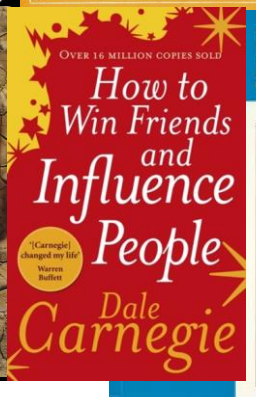


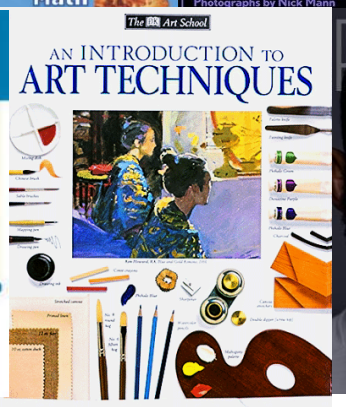












LIT P1

English

PLOT SUMMARY

1	Ebenezer Scrooge is at work in his counting house on Christmas Eve. He refuses to pay to heat it, so his clerk, Bob Cratchit, is cold. Fred, Scrooge's nephew, asks Scrooge to Christmas Dinner. He refuses with "Bah! Humbug!" Two men ask for money for charity. Scrooge refuses. Bob is begrudgingly given Christmas Day off work. At home, Scrooge is visited by the ghost of his dead partner, Jacob Marley, who tells Scrooge that, due to his greedy life, he has to wander the Earth wearing heavy chains. Marley tries to stop Scrooge from doing the same. He tells Scrooge that three spirits will visit him during the next three nights. Scrooge falls asleep.
2	He wakes and the Ghost of Christmas Past takes Scrooge into the past. Invisible to those he watches, Scrooge revisits his childhood school days, his apprenticeship with a jolly merchant named Fezziwig, and his engagement to Belle, who leaves Scrooge as he loves money too much to love another human being. Scrooge sheds tears of regret before being returned to his bed.
3	The Ghost of Christmas Present shows Scrooge Christmas as it will happen that year. Scrooge watches the Cratchit family eat a tiny meal in their little home. He sees Bob Cratchit's crippled son, Tiny Tim, whose kindness and humility warms Scrooge's heart. The spectre shows Scrooge his nephew's Christmas party, where they are mocking him. Toward the end of the day, the ghost shows Scrooge two starved children, Ignorance and Want. He vanishes as Scrooge notices a dark, hooded figure coming.
4	The Ghost of Christmas Yet to Come takes Scrooge through a sequence of scenes linked to an unnamed man's death, such as his clothes being stolen and sold, and city workers suggesting they would only go to the funeral if there were food provided. The reader realises that this refers to Scrooge, but he does not. He begs to know the name of the dead man. He finds himself in a churchyard with the spirit pointing to a grave. Scrooge looks at the headstone and is shocked to read his own name. He is desperate to change his fate and promises to change his ways. He suddenly finds himself safely tucked in his bed.
5	Scrooge rushes out onto the street hoping to share his newfound Christmas spirit. He sends a turkey to the Cratchit house and goes to Fred's party, As the years go by, he continues to celebrate Christmas with all his heart. He treats Tiny Tim as if he were his own child, gives gifts for the poor and is kind, generous and warm.

Themes

What are the main themes?

- Christmas Spirit
- Poverty
- Transformation
- Politics
- Generocity
- Family

Author's Intent

Why did Dickens write the novella?

- To reduce the extreme divide between the upper class and the destitute lower class
- To use the spirit of christmas to promote the idea of year round generocity
- To contrast the ideas of economist Thomas Malthus and criticise the poor law
- To remind people that there is always an opportunity to change if you are willing

CHARACTERS

Ebenezer Scrooge	Miserly, mean, bitter, materialistic, unsympathetic, indifferent, cold _____ Selfish, generous, happy, sociable, transformed.	Marley's Ghost	Materialistic, self-centred, terrifying, haunting, _____ Exhausted, regretful, hopeful, selfless, wise.
Fred – Scrooge's nephew	Warm-hearted, cheerful, optimistic, insightful, determined, generous, forgiving, jovial, caring.	Bob Cratchit	Uncomplaining, polite, patient, good-humoured, caring, cheerful, loving, forgiving.
Fan – Scrooge's sister	Affectionate, loving, jolly. Dead.	Tiny Tim – Bob's son.	Frail, ill, good, religious.
Belle – Scrooge's former fiancée.	Beautiful, wise, poor, family-orientated.	Ignorance and Want	Symbolic, symptomatic, desperate, neglected, abandoned.
Ghost of Christmas Past	Contradictory, strong, gentle, quiet, forceful, questioning, mysterious, ephemeral.	Ghost of Christmas Present	Compassionate, abundant, generous, cheerful, jolly, friendly, severe, sympathetic, prophetic.
Ghost of Christmas Yet to Come	Mysterious, silent, ominous, intimidating, frightening, resolute.	KEY INFO: **Written:** 1843 **Structure:**5 Stave (chapter) novella **Genre:** Christmas ghost story. Political diatribe	

English

Key Quotations (AO1):

Stave One
'He was as tight-fisted as a grind stone' – about Scrooge
'His face was ruddy and handsome, his eyes sparkled' – Fred (presented as the opposite to Scrooge)
'I wear the chain I forged in life' –Ghost of Marley

Stave Two
'It wore a tunic of the purest white… from the crown of its head there sprung a bright clear jet of light' – Ghost of Christmas Past
'A lonely boy was sat reading near a feeble fire' – Scrooge as a young boy
'"Your lip is trembling,' said the Ghost, 'And what is that upon your cheek?' – first sign of emotion from Scrooge

Stave Three
'There sat a jolly Giant, who wore a glowing torch…it was clothed in one simple green robe' – Ghost of Christmas Present
'God bless us everyone!' – Tiny Tim's positive attitude
'Tell me Tiny Tim will live…' – Scrooge showing compassion.

Stave Four
'The phantom slowly, gravely, silently approached' – Ghost of Christmas Yet to Come
'I fear you more than any spectre I have seen' – Scrooge
'Tell me I may sponge away the writing on this stone!' – Scrooge desperate to change his ways
'I will honour Christmas in my heart' - Scrooge

Stave Five
'I'll raise your salary Bob and endeavour to assist your struggling family' – Scrooge changing his ways.
'to Tiny Tim, who did NOT die, he [Scrooge] was a second father' – Scrooge changing his ways
'Wonderful party, wonderful games, wonderful unanimity, won-der-ful happiness!' – repetition shows Scrooge's joy at the end.

Critical Verbs

Dickens wrote the novella because he was influenced by what was going on in the world he was living in. Society, religion, politics, stereotypes, beliefs and personal experiences will all have impacted on **what** Dickens was writing and **why** he was writing it. Use the structure below to create points.

Writer	Uses	Character/setting/event	Critical Verb	Theme/concept/context
Dickens	uses	Tiny Tim The Cratchit's house Tiny Tim's death	to advocate to criticise to celebrate to warn to teach to expose to personify	The impact of poverty in the Victorian era. Emphasising the need for reform

Example PEZEL and critical verbs:

Dickens uses the character of Tiny Tim to **expose** the devastating impact of the class divide in Victorian society. Dickens himself came from a disadvantaged background and, through his literature, wanted to criticise the way that the poor were being treated, in order to keep them in their place. The repetitive use of Tiny Tim's 'crutch' is a symbol of his poverty; but it is also much more than this. The 'crutch' represents his reliance on his family, a family that cannot afford to keep him. By making Tiny Tim disabled, Dickens was further increasing the reader's sympathy for the Cratchit family, as well as their sympathy for the poorest people in society generally. The symbol could also be representative of the innocence of children in this class system. Tiny Tim is a positive child, despite his clear need for help. His crutch is used by Dickens as a way of reminding Scrooge, and therefore readers, that the poor need support to overcome barriers. This was Dickens' overall message to society.

Threshold Concepts

Workhouses and the Poor Law: Workhouses were a form of 'support' for poor families during the Victorian era. The Poor Law was introduced which meant that families had to go to these workhouses and could not receive any support if people in their family were 'able-bodied'. Dickens was very concerned by the plight of the poor and wrote many of his novels to express his anguish at the difficulties the poor had in society. Workhouses were not conducive to allowing families to progress and, in many cases, the families became more destitute as a result of being in these terrible conditions.

Religion vs Science: At the time the novella was written, one of the most prominent movements in society was the migration from a purely religious influence to Scientific research developments in the Industrial Revolution. Although modern in many of his ways of thinking, Dickens' novella seems to be a criticism of this shift. He seems to want to hark back to a day where religion was the predominant guiding force in people's lives. However, many people were beginning to see Science and technological advances as the way forward.

Context

Dickens was born Charles John Huffam Dickens on February 7, 1812, in Portsmouth, on the southern coast of England.

The famed British author was the second of eight children. His father, John Dickens, was a naval clerk who dreamed of striking it rich. Charles' mother, Elizabeth Barrow, aspired to be a teacher and school director.

Despite his parents' best efforts, the family remained poor. Nevertheless, they were happy in the early days. In 1816, they moved to Chatham, Kent, where young Dickens and his siblings were free to roam the countryside and explore the old castle at Rochester.

The main features involved in the Industrial Revolution were technological, socioeconomic, and cultural. The technological changes included the following: (1) the use of new basic materials, chiefly iron and steel, (2) the use of new energy sources, including both fuels and motive power, such as coal, the steam engine, electricity, petroleum, and the internal-combustion engine, (3) the invention of new machines, such as the spinning jenny and the power loom that permitted increased production with a smaller expenditure of human energy, (4) a new organization of work known as the factory system, which entailed increased division of labour and specialization of function, (5) important developments in transportation and communication, including the steam locomotive, steamship, automobile, airplane, telegraph, and radio, and (6) the increasing application of science to industry. These technological changes made possible a tremendously increased use of natural resources and the mass production of manufactured goods.

The Victorian era marked the beginning of the supernatural which has only grown with the passage of time. Between 1750 to 1950 the main focus in Britain was on religion and it was this focus on religion which was accompanied by several beliefs.

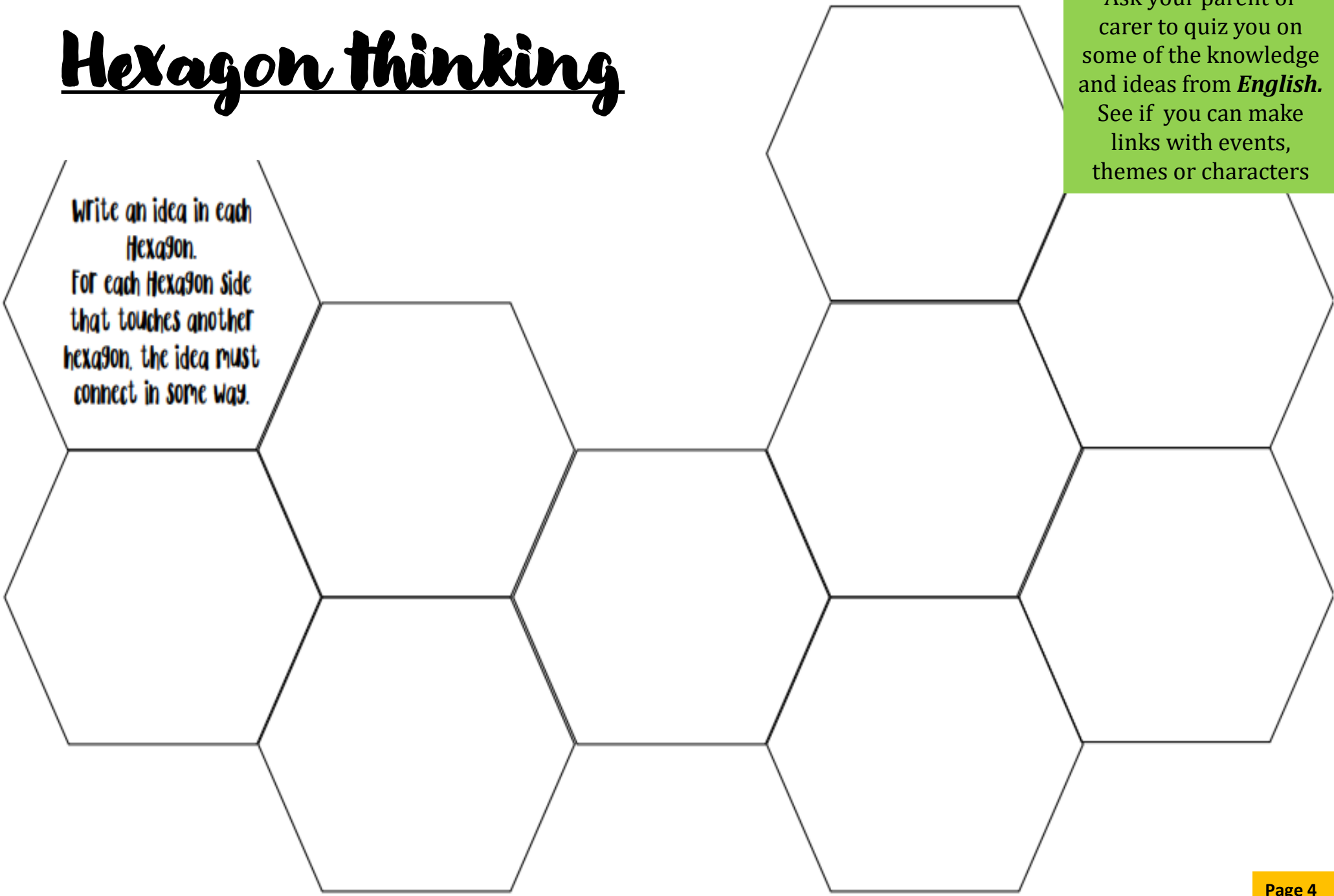
England witnessed some sort of a contradiction. On one hand was the emergence industrial revolution which modernized the world with the help of new scientific inventions. On the other hand, practices like the witchcraft still found a place and were considered extremely popular. As time passed by, this fascination grew all the more intense. Particularly, the fascination with ghosts and ghost stories began to develop.

A Christmas Carol is a Victorian Morality tale. It has elements of a 'ghost story', but its purpose is to deliver a clear message to its readers. Therefore, it can be classed as a morality novella.

Hexagon thinking

Ask your parent or carer to quiz you on some of the knowledge and ideas from ***English.*** See if you can make links with events, themes or characters

Write an idea in each Hexagon.
For each Hexagon side that touches another hexagon, the idea must connect in some way.



YEAR 10 – SIMILARITY...

Maths

Congruence, similarity & enlargement

What do I need to be able to do?

By the end of this unit you should be able to:

- Enlarge by a positive scale factor
- Enlarge by a fractional scale factor
- Identify similar shapes
- Work out missing sides and angles in similar shapes
- Use parallel lines to find missing angles
- Understand similarity and congruence

Keywords

Enlarge: to make a shape bigger (or smaller) by a given multiplier (scale factor)
Scale Factor: the multiplier of enlargement
Centre of enlargement: the point the shape is enlarged from
Similar: when one shape can become another with a reflection, rotation, enlargement or translation
Congruent: the same size and shape
Corresponding: items that appear in the same place in two similar situations
Parallel: straight lines that never meet (equal gradients)

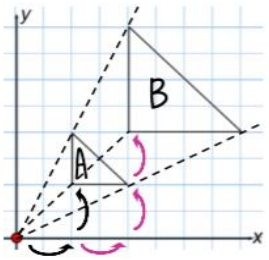
Positive scale factors (R)

Enlargement from a point

Enlarge shape A by SF 2 from (0,0)

The shape is enlarged by 2

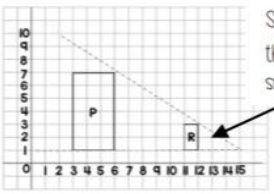
The distance from the point enlarges by 2



Fractional scale factors (R)

Fractions less than 1 make a shape SMALLER

R is an enlargement of P by a scale factor $\frac{1}{3}$ from centre of enlargement (15,1)



SF $\frac{1}{3}$ - R is three times smaller than P

Identify similar shapes

Angles in similar shapes do not change.
e.g. if a triangle gets bigger the angles can not go above 180°

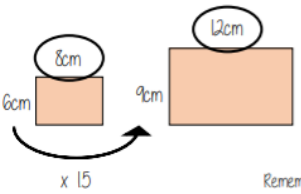
Similar shapes

Scale Factor: Both sides on the bigger shape are 1.5 times bigger

Compare sides: 6 : 9 = 2 : 3 ; 8 : 12 = 2 : 3

Both sets of sides are in the same ratio

Information in similar shapes



Compare the equivalent side on both shapes

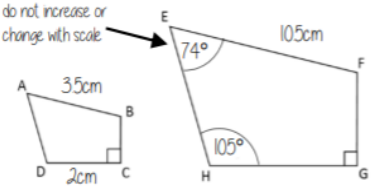
Scale Factor is the multiplicative relationship between the two lengths

Shape ABCD and EFGH are similar

Notation helps us find the corresponding sides

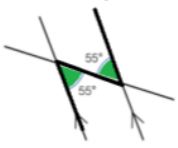
AB and EF are corresponding

Remember angles do not increase or change with scale



Angles in parallel lines (R)

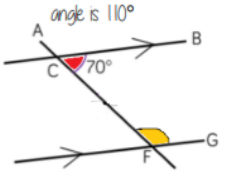
Alternate angles



Because alternate angles are equal the highlighted angles are the same size

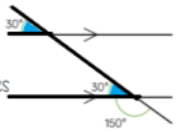
Co-interior angles

Because co-interior angles have a sum of 180° the highlighted angle is 110°



Corresponding angles

Because corresponding angles are equal the highlighted angles are the same size



Os angles on a line add up to 180° co-interior angles can also be calculated from applying alternate/ corresponding rules first

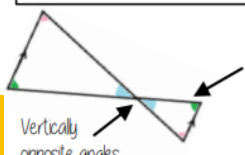
Similar triangles

Shares a vertex

Because corresponding angles are equal the highlighted angles are the same size

Parallel lines – all angles will be the same in both triangle

Os all angles are the same this is similar – it only one pair of sides are needed to show equality

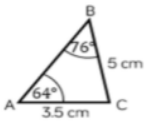


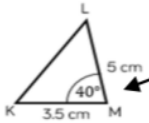
Vertically opposite angles

All the angles in both triangles are the same and so similar

Congruence and Similarity

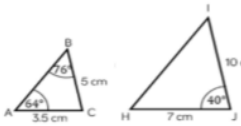
Congruent shapes are identical – all corresponding sides and angles are the same size





$A\hat{C}B = K\hat{M}L$

Because all the angles are the same and AC=KM BC=LM triangles ABC and KLM are **congruent**



Because all angles are the same, but all sides are enlarged by 2 ABC and HIJ are **similar**

Conditions for congruent triangles

Triangles are congruent if they satisfy any of the following conditions

Side-side-side

All three sides on the triangle are the same size

Angle-side-angle

Two angles and the side connecting them are equal in two triangles

Side-angle-side

Two sides and the angle in-between them are equal in two triangles (it will also mean the third side is the same size on both shapes)

Right angle-hypotenuse-side

The triangles both have a right angle, the hypotenuse and one side are the same

YEAR 10 – SIMILARITY...

Maths

Trigonometry

What do I need to be able to do?

By the end of this unit you should be able to:

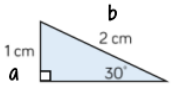
- Work fluently with hypotenuse, opposite and adjacent sides
- Use the tan, sine and cosine ratio to find missing side lengths
- Use the tan, sine and cosine ratio to find missing angles
- Calculate sides using Pythagoras' Theorem

Keywords

Enlarge: to make a shape bigger (or smaller) by a given multiplier (scale factor)
Scale Factor: the multiplier of enlargement
Constant: a value that remains the same
Cosine ratio: the ratio of the length of the adjacent side to that of the hypotenuse. The sine of the complement.
Sine ratio: the ratio of the length of the opposite side to that of the hypotenuse.
Tangent ratio: the ratio of the length of the opposite side to that of the adjacent side.
Inverse: function that has the opposite effect.
Hypotenuse: longest side of a right-angled triangle. It is the side opposite the right-angle.

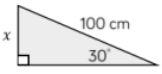
Ratio in right-angled triangles

When the angle is the same the ratio of sides a and b will also remain the same

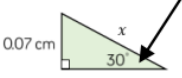


a : b
1 : 2

$\frac{a}{b} = \frac{1}{2}$



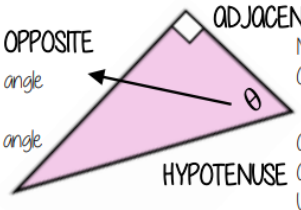
a : b
x : 100
50 : 100



a : b
0.07 : x
0.07 : 0.14

Hypotenuse, adjacent and opposite

ONLY right-angled triangles are labelled in this way



OPPOSITE
Always opposite an acute angle
Useful to label second
Position depend upon the angle in use for the question

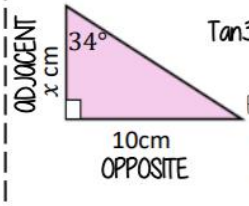
ADJACENT
Next to the angle in question
Often labelled last

HYPOTENUSE
Always the longest side
Always opposite the right angle
Useful to label this first

Tangent ratio: side lengths

$\tan\theta = \frac{\text{opposite side}}{\text{adjacent side}}$

Substitute the values into the tangent formula



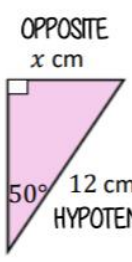
$\tan 34 = \frac{10}{x}$

Equations might need rearranging to solve

$x \times \tan 34 = 10$

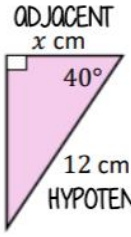
$x = \frac{10}{\tan 34} = 14.8\text{cm}$

Sin and Cos ratio: side lengths



$\sin\theta = \frac{\text{opposite side}}{\text{hypotenuse side}}$

NOTE
The $\sin(x)$ ratio is the same as the $\cos(90-x)$ ratio



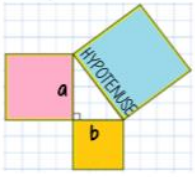
$\cos\theta = \frac{\text{adjacent side}}{\text{hypotenuse side}}$

Substitute the values into the ratio formula

Equations might need rearranging to solve

Pythagoras theorem R

$\text{Hypotenuse}^2 = a^2 + b^2$

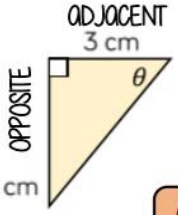


This is commutative – the square of the hypotenuse is equal to the sum of the squares of the two shorter sides

Places to look out for Pythagoras
- Perpendicular heights in isosceles triangles
- Diagonals on right angled shapes
- Distance between coordinates
- Any length made from a right angles

Sin, Cos, Tan: Angles

Inverse trigonometric functions



Label your triangle and choose your trigonometric ratio

Substitute values into the ratio formula

$\tan\theta = \frac{3}{4}$

$\theta = \tan^{-1}\frac{3}{4}$

$\theta = 36.9°$

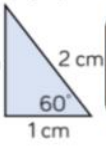
$\theta = \tan^{-1}\frac{\text{opposite side}}{\text{adjacent side}}$

$\theta = \sin^{-1}\frac{\text{opposite side}}{\text{hypotenuse side}}$

$\theta = \cos^{-1}\frac{\text{adjacent side}}{\text{hypotenuse side}}$

Key angles

This side could be calculated using Pythagoras

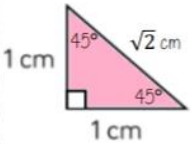


Because trig ratios remain the same for similar shapes you can generalise from the following statements

$\tan 30 = \frac{1}{\sqrt{3}}$ $\tan 60 = \sqrt{3}$

$\cos 30 = \frac{\sqrt{3}}{2}$ $\cos 60 = \frac{1}{2}$

$\sin 30 = \frac{1}{2}$ $\sin 60 = \frac{\sqrt{3}}{2}$



$\tan 45 = 1$

$\cos 45 = \frac{1}{\sqrt{2}}$

$\sin 45 = \frac{1}{\sqrt{2}}$

Key angles 0° and 90°

$\tan 0 = 0$

~~$\tan 90$~~

This value cannot be defined – it is impossible as you cannot have two 90° angles in a triangle

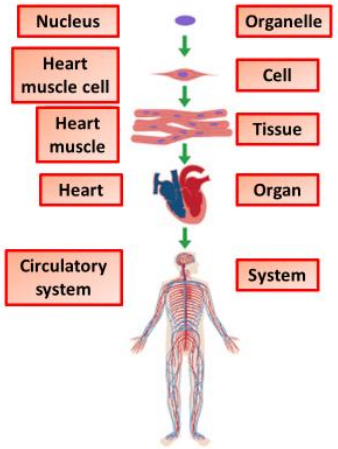
$\sin 0 = 0$ $\sin 90 = 1$

$\cos 0 = 1$ $\cos 90 = 0$

Animal systems And respiration

Animal Tissues

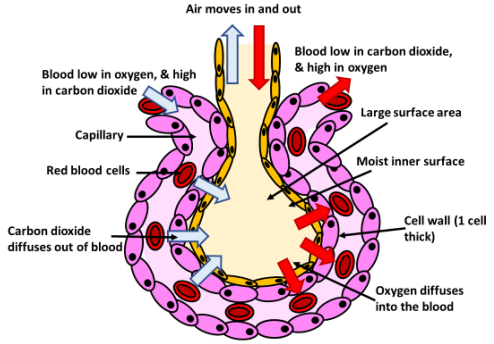
In animals, cells are grouped together to form tissues. These tissues vary in their structure, function, and origin. The four important tissues in an animal body are epithelial, connective, muscular and nervous tissues.



Gaseous Exchange Surfaces

Key features

- Good ventilation
- Good circulation
- A large surface area
- Moist surface
- Short diffusion distance
- Concentration gradient
- Movement of gases



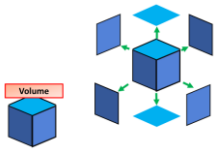
Exchange Surfaces

Organisms must take in food, oxygen and water, and other essential substances, from the environment. Plants also need carbon dioxide for photosynthesis. Organisms also need to remove waste substances.

Small organisms exchange these essential and waste substances between themselves and the environment. They do this over their body surface. Simple chemical substances can diffuse in and out of their bodies.

Inside their bodies, in small organisms, substances don't have to move far.

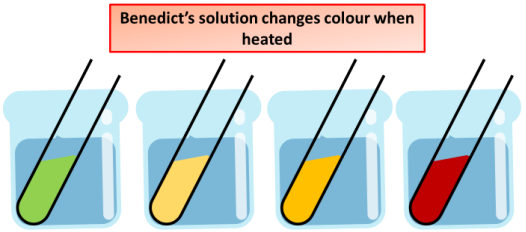
The size of their surface, or surface area, defines how quickly they can absorb substances. The size of their volume defines how much of these substances they need.



Food tests

Testing For Sugars

Sugars like glucose will react with Benedict's solution on heating for a few minutes and give a red-brown product. The precipitate takes a while to settle in the tube – you're more likely to see simply a red or brown colour. If there's not much glucose present, the final colour may be green or yellow, or orange if there's a little more.

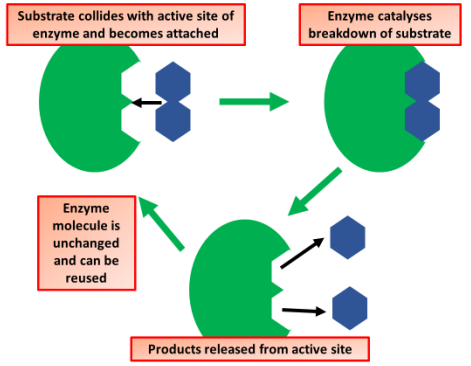


Testing for Starch

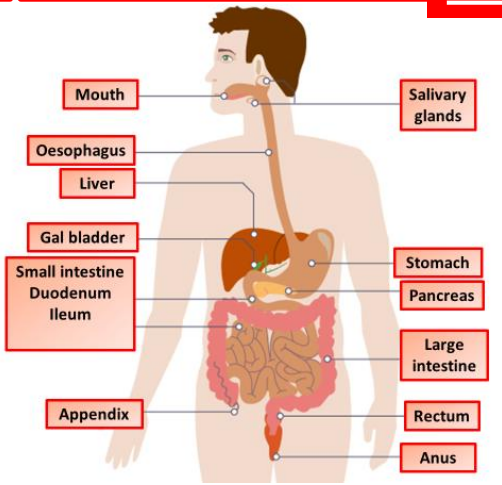
In the presence of starch, iodine turns a blue/black colour. It is possible to distinguish starch from glucose (and other carbohydrates) using this iodine solution test. For example, if iodine is added to a peeled potato, then it will turn black. Benedict's reagent can be used to test for glucose.

Testing for Proteins

- Use a pestle and mortar to grind up a small sample of food.
- Transfer the ground up food into a small beaker. Then add a little bit of distilled water.
- Stir the mixture so that some of the food dissolves in the water.
- Filter using a funnel with filter paper to obtain as clear a solution as possible.
- The solution should be collected in a conical flask.
- Put 2 cm^3 of this solution into a test tube
- Add 2 cm^3 of Biuret solution to the solution in the test tube. Shake gently to mix
- Note any colour change. Proteins will turn the solution pink or purple.

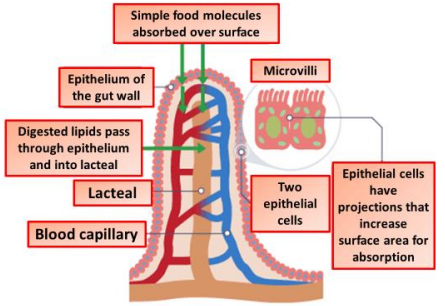


The digestive system



Villi

Villi (singular is villus) are small, finger-like structures in the small intestine. They help to absorb digested food. Each villus has micro-villi which increase the surface area of the intestinal walls. A larger surface area allows nutrients to be taken in more quickly.

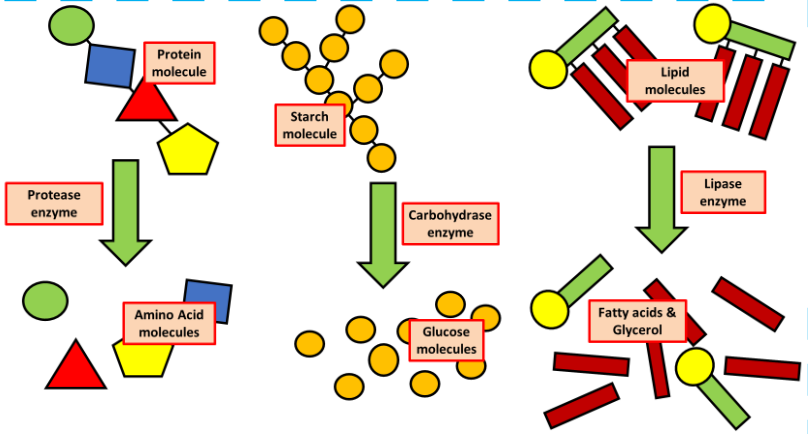


Enzymes

Enzymes are protein molecules in cells which work as catalysts. Enzymes speed up chemical reactions in the body, but do not get used up in the process. Almost all biochemical reactions in living things need enzymes. With an enzyme, chemical reactions go much faster than they would without the enzyme.

Digestive Enzymes

Digestive enzymes are released, or secreted, by the organs of the digestive system. These enzymes include proteases that digest proteins, and nucleases that digest nucleic acids. Examples of digestive enzymes are: Amylase, produced in the mouth.

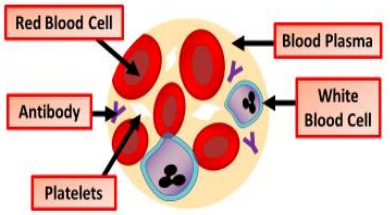


Investigating Enzymes

1. You will investigate the breakdown of **starch** by amylase at different pHs.
2. The different pHs under investigation will be produced using **buffer solutions**. Buffer solutions produce a particular pH, and will maintain it if other substances are added.
3. The amylase will break down the starch.
4. A series of test tubes containing a mixture of starch and amylase is set up at different pHs.
5. A sample is removed from the test tubes every 10 seconds to test for the presence of starch. **Iodine solution** will turn a blue/black colour when starch is present, so when all the starch is broken down, a blue-black colour is no longer produced. The iodine solution will remain orange-brown.
6. For each pH investigated, record the time taken for the disappearance of starch, i.e. when the iodine solution in the spotting tile remains orange-brown.

Blood

It has four main components: plasma, red blood cells, white blood cells, and platelets. Blood has many different functions, including: transporting oxygen and nutrients to the lungs and tissues. forming blood clots to prevent excess blood loss.



Blood vessels

Artery

- The arteries are the blood vessels that deliver oxygen-rich blood from the heart to the tissues of the body.
- Each artery is a muscular tube lined by smooth tissue and has three layers:
- The intima, the inner layer lined by a smooth tissue called endothelium.

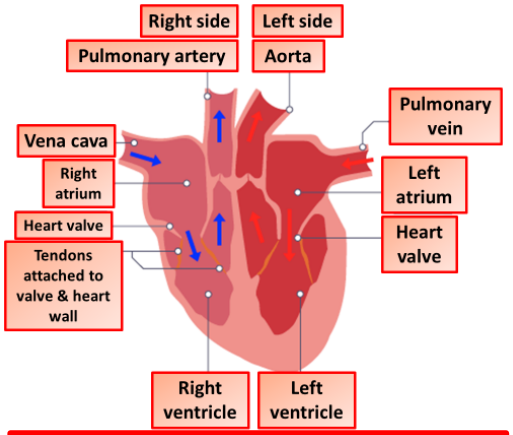
Veins

- A vein is an elastic blood vessel that transports blood from various regions of the body to the heart.
- Unlike the high pressure arterial system, the venous system is a low pressure system that relies on muscle contractions to return blood to the heart.

Capillary

- Capillaries are very thin, approximately 5 micrometers in diameter, and are composed of only two layers of cells; an inner layer of endothelial cells and an outer layer of epithelial cells.
- They are so small that red blood cells need to flow through them single file.

The Heart

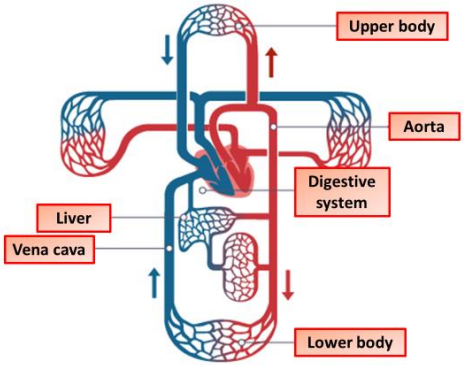


Stents

Coronary arteries that are blocked or have become narrow can be stretched open and have a stent inserted to restore and maintain blood flow. The stent is inserted into a coronary artery in a catheter. Stents are made from metal alloys and do not lead to an immune response in the patient.

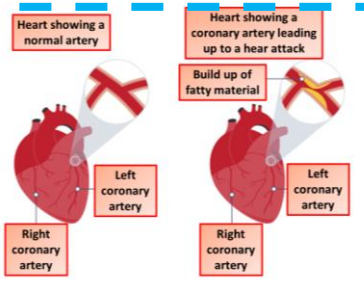
Circulation

Blood enters the heart through the atria. Blood from two vena cavae enters the right atrium. Blood from the pulmonary veins enters the left atrium. The atria fill, followed by the ventricles. Blood is prevented from flowing back into the atria by heart valves.
Blood leaves the heart in the body's main artery - the aorta - from the left side, and the pulmonary artery, from the right.



Coronary heart disease

The heart is a muscular pump. Like all muscles, it needs oxygen for aerobic respiration to contract. The coronary arteries supply blood, and therefore oxygen, to the heart muscle.
The coronary arteries may become blocked by a build-up of fatty material, caused by certain kinds of 'bad' cholesterol. As the fatty material increases, one or more coronary arteries narrow, and can become blocked.



Respiration

Respiration is the chemical reaction which occurs inside the **mitochondria** of all living cells to release energy for living functions and processes, e.g. movement, warmth and building larger molecules for growth and repair. The reaction is **exothermic**, meaning that energy is released to the surroundings.

Respiration can be either **aerobic** (using oxygen) or **anaerobic** (without using oxygen).

glucose + oxygen → carbon dioxide + water + energy

$$C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + ATP$$

In anaerobic respiration, the glucose is not completely oxidised. This means that there is less energy released than in aerobic respiration.

glucose → lactic acid + energy

$$C_6H_{12}O_6 \rightarrow 2C_3H_6O_3 + ATP$$

In plants and yeast, anaerobic respiration makes some different products. The reaction is also called fermentation and is used in bread-making and beer-brewing.

glucose → ethanol + carbon dioxide + energy

$$C_6H_{12}O_6 \rightarrow C_2H_5OH + CO_2 + ATP$$

Effect of Exercise

When a person exercises, their body (specifically their **muscles**) need much more energy. To release more energy, the amount of respiration reactions occurring has to increase.

The **heart** pumps faster and the **breathing** rate and breath volume all increase to supply more **oxygen** to the muscles via the bloodstream.

If the muscles are not receiving enough oxygen to keep up the demand needed by the respiration reactions, then **anaerobic** respiration begins to occur. This incomplete oxidation of the glucose produces **lactic acid**, which can build up in the muscles and results in an **oxygen debt**.

After long periods of exercise, the muscles can become fatigued and stop contracting. You might experience a pain commonly called a **stitch**.

Metabolism

Metabolism is the combination of all the reactions in a cell or in the body.

Energy released during respiration is used during metabolic processes to synthesise new molecules:

- Glucose is converted to starch, glycogen and cellulose.
- Glycerol and three fatty acids are joined to form a lipid molecule.
- Glucose and nitrate ions are joined to form amino acids.
- Amino acids are joined to form proteins.
- Excess proteins are broken down and released as urea during excretion.

Respiration itself is also a process which is included in metabolism.

Oxygen Debt (HT only)

During vigorous exercise, the body can begin to carry out **anaerobic respiration** and produces **lactic acid**.

Lactic acid is transported via the bloodstream to the **liver**. The liver converts the lactic acid back into **glucose**. However, **oxygen** is needed to carry out this reaction.

The **oxygen debt** is the amount of the oxygen required by the body to convert the built-up lactic acid back into glucose and remove it from the respiring cells.

Plant Tissues, Organs and Systems

Leaves are plant organs and their main function is to absorb sunlight energy for use in **photosynthesis**. Within the cells are small organelles called **chloroplasts** which contain a green pigment called **chlorophyll**. This is the part of the plant which absorbs the sunlight and where photosynthesis occurs.

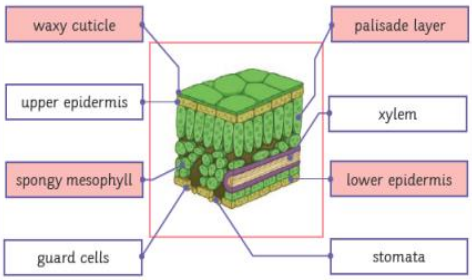
sunlight

carbon dioxide + water ⟶ oxygen + glucose

Leaves are adapted to carry out their function. Leaves are typically flat and thin with a large **surface area**. This means they have a maximum area to absorb the sunlight and carbon dioxide. The **thin** shape reduces the distance for **diffusion** of water and gases.

Leaves contain vessels called xylem and phloem. The **xylem** transport water and dissolved minerals toward the leaves. The **phloem** transport glucose and other products from photosynthesis around the plant.

The large **air spaces** between the cells of the spongy mesophyll layer allow for the diffusion of gases. **Carbon dioxide** enters the leaves and **oxygen** exits the leaves.



The **guard cells** are specially adapted cells located on the underside of the leaf. They are positioned in pairs, surrounding the **stomata** (a small opening in the epidermis layer). The guard cells change shape to open and close the stomata, controlling the rate of **gas exchange** in the leaf.

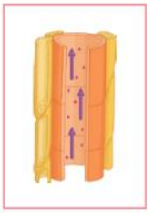
Root Hair Cells

Plants absorb water by **osmosis** through the root hair cells of the roots. Dissolved in the water are important minerals for the plant's growth and development, which are absorbed by **active transport**.

The **root hair cells** are adapted to their function with the following features:

- Finger-like projection in the membrane increases the **surface area** available for water and minerals to be absorbed across.
- The narrow shape of the projection can squeeze into small spaces between soil particles, bringing it closer and reducing the distance of the **diffusion pathway**.
- The cell has many **mitochondria**, which release energy required for the active transport of some substances.

Xylem and Phloem



Xylem vessels transport **water** through the plant, from roots to leaves. They are made up of **dead**, lignified cells, which are joined end to end with no walls between them, forming a long central tube down the middle. The movement of the water, and dissolved minerals, along the xylem is in a **transpiration** stream.

Xylem vessels also provide **support** and **strength** to the plant structure. They are found in the middle of roots so they aren't crushed within the soil. They are found in the middle of the stem to provide strength and prevent bending. In the leaves, they are found in **vascular bundles** alongside the phloem and can be seen as the veins which network across the leaf.

Phloem vessels transport **food** such as dissolved sugars and glucose from photosynthesis. The food is transported around the plant to where growth is occurring (root and shoot tips), as well as to the organs which store the food. The transport occurs in **all directions** throughout the plant. The cells making up the phloem tube are **living**, with small holes in the walls where the cells are joined.

Transpiration and Translocation

Transpiration is the loss of water, by **evaporation** and **diffusion**, from the leaves of the plant. Water is a cohesive molecule and as it evaporates, there is less water in the leaf, so water from further back moves up to take its place. This, in turn, draws more water with it. This is the **transpiration stream**.

Transpiration occurs naturally as there is a tendency for water to diffuse from the leaves (where the concentration is relatively high) to the air around the plants (where the concentration is relatively low), via the **stomata**.

Environmental factors can change the rate at which transpiration occurs:

- Increased **light intensity** will increase the rate of transpiration because light stimulates the stomata to open. The leaf will also be warmed by the sunlight.
- Increased **temperature** will cause the water to evaporate more quickly and so increase the rate of transpiration.
- Increased **humidity** (moisture in the air) will reduce the rate of transpiration. Whereas if the air becomes drier, the rate increases. A greater concentration gradient will increase the rate of diffusion.
- If the **wind speed** increases, then the rate of transpiration also increases. This is because as the water surrounding the leaves is moved away more quickly, the concentration gradient is increased.
- If the **water content** in the soil is decreased, then the rate of absorption in the roots decreases. This causes the stomata to become flaccid and close, reducing transpiration. If the loss of turgor affects the whole plant, then it will wilt.

AQA GCSE (Combined Science) Unit 4: Bioenergetics Higher

Photosynthesis

Photosynthesis is a chemical reaction which takes place in plants. It converts **carbon dioxide** and **water** into **glucose** and **oxygen**. It uses **light** energy to power the chemical reaction, which is absorbed by the green pigment **chlorophyll**. This means that photosynthesis is an example of an **endothermic** reaction. The whole reaction takes place inside the **chloroplasts** which are small organelles found in plant cells.

Plants acquire the carbon dioxide via diffusion through the **stomata** of their leaves. The water is absorbed from the soil through the **roots** and transported to the cells carrying out photosynthesis, via the **xylem**.

The glucose made in photosynthesis is used for respiration, stored as starch, fat or oils, used to produce cellulose or used to produce amino acids for protein synthesis.

The Rate of Photosynthesis and Limiting Factors

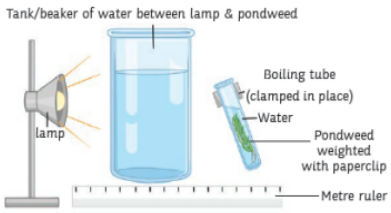
A **limiting factor** is something which stops the photosynthesis reaction from occurring at a faster rate. **Temperature**, **light intensity** and **carbon dioxide** level are all limiting factors.

Increasing the temperature of the surroundings will increase the rate of reaction, but only up to around 45°C. At around this temperature, the enzymes which catalyse the reaction become denatured.

Increasing the light intensity will increase the rate of reaction because there is more energy to carry out more reactions. Increasing the carbon dioxide concentration will also increase the rate of reaction because there are more reactants available.

The Effect of Light Intensity on the Rate of Photosynthesis (RPI)

The amount of light a plant receives affects the rate of photosynthesis. If a plant receives lots of light, lots of photosynthesis will occur. If there is very little or no light, photosynthesis will stop.



Method

1. Measure 20cm^3 of sodium hydrogen carbonate solution and pour into a boiling tube.
2. Collect a 10cm piece of pondweed and gently attach a paper clip to one end.
3. Clamp the boiling tube, ensuring you will be able to shine light onto the pondweed.
4. Place a metre rule next to the clamp stand.
5. Place the lamp 10cm away from the pondweed.
6. Wait two minutes, until the pondweed has started to produce bubbles.
7. Using the stopwatch, count the number of bubbles produced in a minute.
8. Repeat stages 5 to 7, moving the lamp 10cm further away from the pondweed each time until you have five different distances.
9. Now repeat the experiment twice more to ensure you have three readings for each distance.

The **independent** variable was the light intensity.

The **dependent** variable was the amount of bubbles produced. Counting the bubbles is a common method, but you could use a gas syringe instead to more accurately measure the volume of oxygen produced.

The **control** variables were same amount of time and same amount of pondweed. A bench lamp is used to control the light intensity and the water in the test tube containing the pondweed is monitored with a thermometer to monitor and control the temperature.

Interaction of Limiting Factors (HT only)

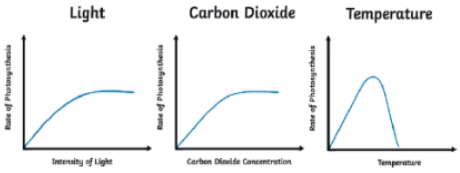
The limiting factor for the reaction will depend on the environmental conditions.

For example:

At night, light intensity is the limiting factor.

In winter, temperature is the limiting factor.

In other conditions, carbon dioxide is usually the limiting factor.



From the graph, you can see that increasing one of the factors will also increase the rate of reaction, but only for so long before it plateaus. This is because another factor will have then become the limiting factor. E.g. you could increase the supply of carbon dioxide, but if there is not enough chlorophyll to absorb the sunlight, then the sunlight will become the limiting factor instead.

Greenhouse Economics (HT only)

To grow plants in the most suitable conditions, a greenhouse can be used.

A greenhouse traps the sun's radiation as heat inside the greenhouse, so that temperature is not a limiting factor for the rate of photosynthesis.

Artificial lighting can be installed in the greenhouse to provide constant light energy and prevent light intensity being a limiting factor.

A paraffin heater can be used in the greenhouse to not only maintain a suitable temperature, but the by-product of the combustion off the paraffin is carbon dioxide.

Enclosing the crops in a greenhouse and regulating all the conditions in this way can be expensive; however, it is often outweighed because the harvest of the crop is much healthier, faster-grown crops. Furthermore, the enclosed conditions mean that disease and pests can be easily controlled and prevented.

PARENT/CARER QUIZZES

Ask your parent or carer to quiz you on some of the knowledge from ***Maths*** and ***Science.*** Record your scores below and see if you improve each time.

Date	Subject	Score /10	Did you improve from last time?

MFL

Grade 9

phrases French

Reach for the stars

150 word wow phrases

Introducing ideas

il s'agit de – this is about/ to do with

quant à – as for

pour comble de malheur – to cap it all

étant donné que – given that

vu que – considering that

en raison de – in view of

il me semble que – it seems to me that

qu'on ne s'y trompe pas – let there be no mistake about it

à tort ou à raison – rightly or wrongly

grâce à – thanks to

à cause de – because of

en effet – indeed, in fact

tout d'abord – First of all

The Subjunctive

Il faut que (to have to) and bien que (although) are followed by the subjunctive

Il faut que j'aille – I have to go

Bien que je (ne) sois (pas) – although I am (not)

Bien que ce (ne) soit) – although it is (not)

Mes parents veulent que je fasse – My parents want me to do…

Autant que je sâche – as far as I know

Go through this booklet and pick out between 3-5 phrases in each section that you are going to use in your 150 word piece of writing no matter what the bullet points – learn them off by heart. In your exam write them down when you are planning to make sure you include them in your answers

Opinions

ça m'amuse (used for something funny)

ça me plaît (used for general liking)

ça m'a plu – I enjoyed it

ce qui m'inquiète c'est... - What worries me is

ce qui m'inquiétait c'était – what I found worrying was

je n'en ai pas envie – I don't want to

j'apprécie (often used for comparing two likes)

je pense que - I think that

je crois que - I believe that

je dirais que I would say that

je suis d'avis que- I am of the opinion that

à mon avis – in my opinion

pour ma part – as for me

d'après moi/selon moi – according to me

quant à moi – In my opinion

j'ai l'impression que... – I get the impression that...

je dirais que - I would say that...

je dois avouer que... - I must admit that...

j'aurais dit/cru que - I would have said/believed that

je me suis rendu compte que - i realised that

d'un côté, j'aime ___ parce que..mais de l'autre côté, je n'aime pas ___ parce que - On one hand, i like __ because...but on the other, don't like___ because..

je ne crois pas que ce soit le cas – I don't believe that that's the case

çela peut être... - it can be...

A variety of adjectives

agaçant (annoying/irritating)

noiçif - harmful

décevant (disappointing)

délicieux (delicious)

divertissant (entertaining)

émouvant (moving)

cauchemardesque – nightmarish

réussi (successful)

ridicule (ridiculous)

superbe (impressive, in a large scale)

serviable - useful

inoubiable (unforgettable)

épouvantable – horrendous

Idioms (you only need 1 or 2)

Le revers de la médaille – on the other side of the coin

c'est le pied! – its great!

j'ai mangé comme quatre – I ate like a horse

les doigts dans le nez – hands down

je suis tombé sur les pommes – I fainted

ça me prend la tête – it bugs me

coûter les yeux de la tête – costs an arm and a leg

ce n'est pas ma tasse de thé – it's not my cup of tea

mon peché mignon – guilty pleasure

c'est n'est pas la mer à boire – it's not a big deal

ça ne mange pas du pain – it won't break the bank

Extending your sentence (Fancy connectives)

que/qui – which, that - use *que* if you are following with a pronoun eg. La Suisse est le pay **que je** préfère.

- Use *qui* if there is no pronoun eg. Mon frère**, qui est** grand.

ce que/ce qui – use at the beginning of sentences to express an opinion – Ce que j'aime c'est...

Ce qui est...

quand – when

pendant que – while

au moment où – at the point when

puisque – since

depuis que – since

comme – as

non seulement... mais de plus – not only...but also...

par exemple...ou bien – for example...or alternatively

par contre,... – on the other hand,...

d'ailleurs - Besides/Moreover/Furthermore

en fait,... - In fact,...

néanmoins - nevertheless

pourtant,... – however,...

dés que – as soon as

des fois - sometimes

du coup -therefore

de plus... - Furthermore...

A range of grammatical structures

Venir de + INF – to mean you have just done something.

Je viens de rentrer – I have just come back

Je venais de rentrer....quand elle est arrivée – I had just come back...when she arrived

si j'avais su... (+ conditional) - if i had known...

avant de (+ inf),... – Before (doing sth.),...

après avoir/être (+inf)... - After having (done something)...

quand j'étais...- when I was...

j'ai hâte de... - I cant wait

Week 1: Time phrases

French	Meaning	First guess	Checked in a dictionary	After learning	Reviewed
à l'heure	On time				
l'an (m)/ l'année (f)	Year				
après-demain	After tomorrow				
l'après-midi	Afternoon				
aujourd'hui	today				
avant-hier	The day before yesterday				
bientôt	Soon				
demain	Tomorrow				
dernier/dernière	Last				
en ce moment	At the moment				
en retard	Late				
hier	yesterday				
il y a (2 mois)	...ago (2 months)				
le jour/ la journée	The day				
le lendemain	The day after				
le matin	On The morning				
la nuit	At night				
prochain(e)	next				
le soir	On the evening				

Self-test score:..... /20

Teacher test score: ..... /20

Re-test score: ..... /20

Week 2: Expressions of frequency

French		First guess	Checked in a dictionary	After learning	Reviewed
chaque	each				
d'habitude	Usually				
de temps en temps	From time to time				
déjà	already				
de nouveau	again				
en train de (faire)	In the process of				
encore une fois	Once more time				
une fois	once				
longtemps	longtime				
maintenant	now				
normalement	normally				
parfois	sometimes				
par mois	Per month				
par semaine	Per week				
quelquefois	sometimes				
rarement	rarely				
souvent	often				
toujours	always				
tous les jours	everyday				
tout de suite	Straigh away				

Self-test score:..... /20

Teacher test score: ..... /20

Re-test score: ..... /20

Week 3: Opinions

French		First guess	Checked in a dictionary	After learning	Reviewed
absolument	Absoluly				
ça dépend	It depends				
ça m'énerve	It ennoys me				
ça me fait rire	It makes me laught				
ça me plaît	It pleased me/ i like it				
ça m'est égal	I am not bothered				
ça ne me dit rien					
ça suffit	enough				
croire	To believe				
espérer	To hope				
étonner	To be surprised				
franchement	Franckly				
(s')intéresser à	To be interested in				
(en avoir) marre	To be fed up of				
(moi) non plus	Me neither				
penser	To think				
peut-être	Maybe				
sembler	To seem				
supporter	To support				
vraiment	Really				

Self-test score:..... /20

Teacher test score: ..... /20

Re-test score: ..... /20

Week 4: Adjectives

French		First guess	Checked in a dictionary	After learning	Reviewed
affreux/affreuse	awful				
agréable	Pleasant				
amusant(e)	fun				
barbant(e)	Boring				
beau/belle	beautiful				
cher/chère	Expensive/ dear				
chouette	cool				
compliqué(e)	complicated				
content(e)	happy				
désagréable	Unpleasant				
drôle	funny				
embêtant(e)	Annoying				
ennuyeux/ ennuyeuse	Boring				
facile	easy				
faible	weak				
formidable	Great/ formidable				
génial(e)	Great				
grave	serious				
habile	Abled				
intéressant(e)	Interesting				

Self-test score:..... /20

Teacher test score: ..... /20

Re-test score: ..... /20

Week 5: More adjectives

French		First guess	Checked in a dictionary	After learning	Reviewed
inutile	Useless				
incroyable	unbelievable				
inquiet/inquiète	Worried				
joli(e)	beatiful				
laid(e)	ugly				
marrant(e)	funny				
mauvais(e)	bad				
merveilleux/ merveilleuse	marvalous				
mignon/ mignonne	cute				
moche	ugly				
nouveau/ nouvelle	new				
nul/nulle	rubbish				
parfait(e)	perfect				
passionnant(e)	Exciting				
pratique	pratical				
ridicule	ridiculous				
rigolo	funny				
sage	wise				
sensass	Great				
utile	Useful				

Self-test score:..... /20

Teacher test score: ..... /20

Re-test score: ..... /20

MFL

Present Tense

Use: *to speak about what is happening now or regularly*
e.g. I watch films on Saturday evenings
How: *take away the infinitive ending (i.e. IR/RE/ER) and add the correct ending.*

	IR	RE	ER
1. Je	is	s	e
2. Tu	is	es	es
3. Il/Elle	it	-	e
4. Nous	issons	ons	ons
5. Vous	issez	ez	ez
6. Ils/Elles	issent	ent	ent

Examples in English:
- Usually, I go to the swimming pool with my sister.
- I like eating chocolate.
- Right now, I am drinking a coffee.

e.g.
Aimer ➡Aimer ➡Aim ➡Nous aim ➡Nous aim+ons = Nous aimons
Vendre ➡Vendre ➡Vend ➡Vous vend ➡Vous vend+ez = Vous vendez
Finir ➡Finir ➡Fin ➡Je fin ➡Je fin+is = Je finis

Perfect Tense – *Have…*

Use: *to speak about something that has happened in the past, but is now over. e.g. I have eaten/I ate a cheese sandwich for lunch.*
How: *use present tense 'avoir/être' as an auxiliary and add the past participle (with correct agreement if using être).*

1. Je **I**	ai	4. Nous **We**	avons
2. Tu **You**	as	5. Vous **You (pl.)**	avez
3. On **One**	a	6. Ils **They**	ont

1. Je **I**	suis	4. Nous **We**	sommes
2. Tu **You**	es	5. Vous **You (pl.)**	êtes
3. On **One**	est	6. Ils **They**	sont

Past Participle
ER – é
IR – i
RE - u

These verbs use Être
Devenir
Revenir
Monter
Rentrer
Sortir
Venir
Aller
Naître
Descendre
Entrer
Rentrer
Tomber
Rester
Arriver
Mourir
Partir

Agreements if using Être
Feminine – e
Plural - s

e.g.
Aimer ➡j'ai aimer ➡j'ai aimer ➡j'ai aim+é = j'ai aimé
Aller ➡ je suis aller ➡je suis aller ➡ je suis all+é = je suis allé(e)(s)

Imperfect Tense – *Used to…*

Use: *to speak about something that used to happen regularly in the past, but it is now over. e.g. I used to walk to school, but now I take the bus.*
How: *use present tense, third person plural minus –ons and add the correct ending.*

1. Je **I**	Present tense, third person plural (nous) minus -ons	**ais**	4. Nous **We**	Present tense, third person plural (nous) minus -ons	**ions**
2. Tu **You**		**ais**	5. Vous **You (pl.)**		**iez**
3. On **One**		**ait**	6. Ils **They**		**aient**

e.g.
Aimer ➡nous aimons ➡aim ➡on aim ➡on aim+ait = on aimait *one used to like*
Finir ➡nous finissons ➡finiss ➡ils finiss ➡Ils finiss+aient = ils finissaient *they used to finish*

Near Future Tense – *Going to…*

Use: *to speak about things in the very near future (this weekend, tonight)*
e.g. tonight I am going to watch a DVD
How: *use present tense 'aller' and add the infinitive.*

1. Je **I**	vais **am going**	4. Nous **We**	allons **are going**
2. Tu **You**	vas **are going**	5. Vous **You (pl.)**	allez **are going**
3. On **One**	va **are going**	6. Ils **They**	vont **are going**

Infinitive
Jouer – to play
Faire – to do
Manger – to eat

REMEMBER! The infinitive is the basic form of the verb, before it is attached to a person or time. In French, the infinitive always ends in –RE/-IR/-ER. This is what you find in the dictionary. Some examples in English include 'play', 'run', and 'sleep'.

e.g.
Je vais + jouer = I am going to play
On va + faire = we are going to do
Nous allons + aller = we are going to go

Simple Future Tense – *Will…*

Use: *to speak about will happen in the future. There is a nuance of certainty about this.* e.g. I will go to university and I will study law.
How: *use your infinitive (minus the final E for –RE verbs) and add the correct ending.*

1. Je **I**	Infinitive	**ai**	4. Nous **We**	Infinitive	**ons**
2. Tu **You**		**as**	5. Vous **You (pl.)**		**ez**
3. On **One**		**a**	6. Ils **They**		**ont**

e.g.
Je jouer + ai = I will play
Nous manger + ons = we will eat
Ils pourr + ont = they will be able to

Example in English:
- She will play hockey at university.

Conditional Tense – *Would…*

Use: *to speak about something that might happen in the future, but it is based on a condition.*
e.g. I would like go to university and I would like to study law.
How: *use your infinitive (minus the final E for –RE verbs) and add the correct ending.*

1. Je **I**	Infinitive	**ais**	4. Nous **We**	Infinitive	**ions**
2. Tu **You**		**ais**	5. Vous **You (pl.)**		**iez**
3. On **One**		**ait**	6. Ils **They**		**aient**

e.g.
Je jouer + ais = I would play
On manger + ait = we would eat
Ils écouter + aient = they would listen

Example in English:
- They would like to reduce car emissions.

Crime and Punishment (How did justice change in the medieval period?)

Was Anglo-Saxon justice just violent and superstitious?

Crime	Punishment	Law Enforcement
Crimes that threatened authority and wealth were serious and harshly punished.	Punishment was used for retribution and deterrence.	The community was responsible for law enforcement by tithings and the hue and cry.
People had a strong sense of duty so there was a low crime rate.	Fines and Wergild were the most common, corporal punishments and capital punishment were also used.	Guilt/innocence had to be decided by a jury in court. Trial by ordeal was used when a court couldn't decide guilt/innocence.
		Swearing oaths before God was a major part of Anglo-Saxon justice.

Did the Normans annihilate Saxon justice?

YES	NO
William created the **Forest Laws (1072)** which made poaching illegal – this was a social crime. ✓	**Tithings** and **Hue and Cry** stayed the same. ✗
William I built **castles** to watch over the Saxons. ✓	**Trial by Ordeal** Continues to be used to determine guilt or innocence. ✗
Rebellions were punished harshly and the death penalty was used for the rebels. ✓	
The Murdrum Fine (1070) was introduced - if a Saxon murdered a Norman they had to pay a large fine to the king. ✓	
Trial by Combat (1066) was introduced. ✓	
Use of the **death penalty** increased. ✓	
The **sheriff** was introduced for enforcement. ✓	

Did justice improve in the Later Middle Ages?

	Statute of Labourers (1351) made it illegal for peasants to ask for higher wages or move to another village.
	Heresy (following a different religion to the country) was also made illegal.
	Collective Responsibility - Communities were still involved in law enforcement but there were more authorities.
JP	**Parish constables** were unpaid volunteers.
	Justices of the Peace were appointed by the king to hear trials in court.
	Capital punishment gradually decreased, fines became more common and **corporal punishments** were still widely used.

Did the Church help or hinder medieval justice?

- The Church was extremely powerful – it decided what constituted a crime, what trial was used, and what punishments were given.
- Church courts were used to try people accused of moral crimes and were more lenient than other courts.
- They also tried all clergymen accused of crimes and people had to prove their role by reading a passage from the bible. This was known as benefit of the clergy and was often exploited.
- Churches also provided sanctuary (protection from the law).

- Trial by ordeal was used so that God could judge the guilt/innocence of the accused when a jury could not reach a decision.
- Trial by ordeal was banned by the pope in 1215.

Keywords:

Law enforcement –catching criminals and putting them on trial

Tithings – group of 10 men over 12 responsible for each other's behaviour

Hue and cry – anyone who heard the shout for help had to hunt for the criminal

Oath – promise before God

Retribution – revenge

Deterrence – designed to put people off

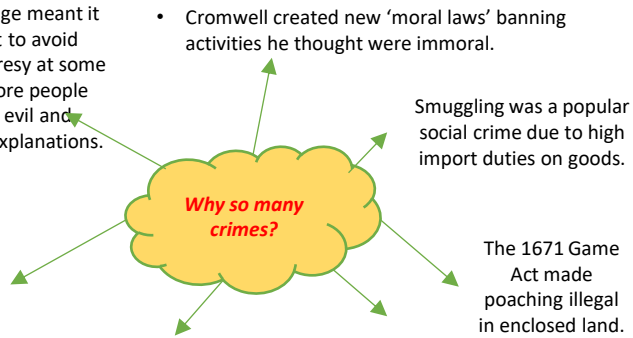
Corporal punishment – physically hurting a criminal

Capital punishment – killing the criminal

Poaching – illegally hunt

Social crime – illegal act but is supported by some

Why were there so many new crimes in the Early Modern Period (15001-1700)



Why were there so many new crimes in the Early Modern Period (15001-1700)

The gunpowder plotters were Catholics who were unhappy with the unfair laws of James I.

They planned to replace him with his daughter.

Robert Catesby enlisted Guy Fawkes to blow up Parliament using barrels of gunpowder.

Two weeks before, Lord Monteagle received a letter warning him not to attend parliament.

They searched the building and found Fawkes.
The rack was used to torture Fawkes and get the names of the rest of the plotters.

The plotters were found guilty of treason and hung, drawn and quartered as a deterrent. Afterwards, Catholics' rights were limited.

Why were Vagabonds treated so harshly?

	Growing population caused more people to move in search of jobs.
	Many became homeless, known as vagrants.
	People saw them as lazy and troublemakers.
	Pamphleteers stirred up trouble in their leaflets.
	1547: Vagrancy Act said able-bodied vagrants should be branded and sold as a slave.
	1597: Act for the Relief of the Poor introduced punishments like whipping and burning the ear.
	1601: Poor Laws introduced poor relief to the 'deserving poor'.
	'Undeserving poor' were branded, whipped or sent to a House of Correction.

Why did people hunt witches in 1500-1700?

- Lots of people of all backgrounds believed in witches.
- They believed witches made a pact with the devil in return for powers.
- Religious change encouraged belief in witches.
- James I encouraged witch hunts in his book Demonologie.
- The Civil War and poor harvests caused economic problems and people wanted someone to blame.
- People viewed unmarried or widowed women as suspicious.
- Matthew Hopkins was employed to hunt witches in Essex and East Anglia.
- He used torture to extract confessions and stirred up panic in 1645-47.

Keywords:

Vagabonds – unemployed/homeless people

Enclosure – land that rich people fenced off from the poor

Import duties – taxes on goods brought into the country

Branded – burned

Poor relief – financial assistance for the poorest

'Deserving poor' – anyone not physically fit to work like the elderly/disabled

High Treason – Plotting to kill the King as well as authority figures (e.g. Government)

Treason – betraying your country/plotting against the King

Who protected the people in the early modern period?

	Collective responsibility was still used.
	Standards of law enforcement varied across the country – rich were better protected than the poor.
	Town constables were employed by the town authorities to stop suspects and arrest criminals.
	Night watchmen were unpaid volunteers who patrolled the streets at night and were overseen by the town constable.
	Thief takers were paid rewards but were often corrupt criminals themselves.

Just how effective was the Bloody Code?

Effective	Not effective
It was designed to be an active deterrent – the hope that the use of capital punishment would stop crime	The system was flawed as many crimes were committed out of desperation (e.g. stealing).
	Pregnant women could make a 'plead for belly' and were often pardoned after the birth.
	If criminals could prove their previous good character they were let off so it was ineffective.
	Minor crimes like poaching were capital crimes in the 17th century.
	The number of crimes carrying the death penalty increased to 50 in 1688.

Keywords:

Collective responsibility – hue and cry and tithings

Typhus – disease

Hard labour – physical work like breaking up rocks

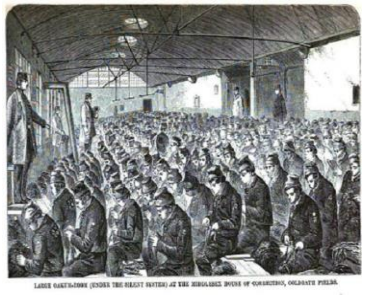
Capital crime – crime that deserves the death penalty

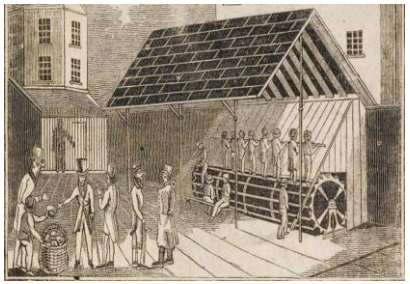
Plead for belly – ask to live until the baby was born

Pardon – let off the punishment for their crime

Colonies – new settlements of the British Empire

Why were prisons so awful?





- Prisons were previously used for holding criminals until their trial so weren't actually a punishment.
- Conditions were poor – inmates had to pay for food and bedding.
- Everyone was housed together.
- Younger prisoners could be corrupted by older criminals.
- Sanitation was poor so typhus was common.
- Houses of Correction were built after 1556 to punish vagabonds and house orphans – inmates had to do hard labour to pay for their keep.

Why were prisons so awful?

When?
17th-19th century

Where?
North America until 1776 after the American Revolution. Started then in Australia until 1868

What?
Prisoners were taken in chains to the British colonies in America to work for 7 or 14 years doing tough manual labour.

How long?
7-14 years (pardon could be issued before full length of sentence served)

Why?
- It was an effective deterrent for criminals.
- It was introduced as England didn't have an effective prison system so this was a good alternative.
- It was also introduced as a way to populate permanent colonies in America.

The Changing Economic World – The Development Gap

AQA

KI : There are global variations in economic development and quality of life

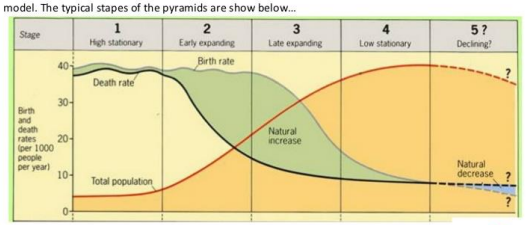
Key terms	Definitions
Birth rate	Number of births in a year per 1000 of the population
Death rate	Number of deaths in a year per 1000 of the population
Demographic Transition Model	A model showing how populations change over time in terms of their birth rates, death rates and total population size
Development	The progress of a country in terms of economic growth, technology and welfare
GNP per capita	Gross national income divided by the size of the population
Human Development Index (HDI)	Development measure using GDP per capita, life expectancy and adult literacy. Given as an index figure
Infant mortality	Average number of deaths of infants under 1 year of age per 1000 live births per year
Life expectancy	Average number of years a person might be expected to live
Literacy rate	Percentage of people who have basic reading or writing skills
Access to safe water	Percentage of people with access to clean water
People per doctor	Number of people per doctor

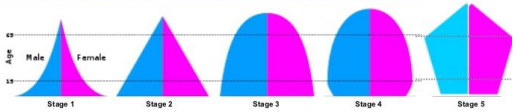
Classification of countries

LIC – Low Income Countries	US $1045 or less GNP 30 countries
NEE – Newly Emerging Economy	80 countries. Number increasing due to globalisation
HIC – High Income Country	US$ 12,736 or more 80 countries

Population Structures & the DTM

The population structures change as countries develop and progress through the demographic transition model. The typical stapes of the pyramids are show below…





Indicator	Limitations
LICs	Not higher death rate as have younger population
Birth rate	Useful except where Government policies
Infant Mortality Rate	Decreasing in HICs. Increasing in LICs. Close link to wealth, access to services. Data can be inaccurate
Life Expectancy	Rising in HICs though may decrease due to obesity
Gross National Income	Blunt tool. No measure of how much $1 will buy. Hides variations
HDI	Most useful indicator. Economic and social element. Data can be unreliable. Does not account for subsistence economy, corrupt governments etc.

Causes of uneven development

Physical	Climate Poor farming land Extreme weather	Few raw materials Lack of safe water Natural hazards
Economic	Poor trade links Debt Lack of education	Primary economy Corrupt government Poor health and water quality
Historical	Colonialisation	Conflict

Consequences of uneven development

Disparities in wealth and health	HICs – higher income, better health care, higher life expectancy, lower IMR NEE – wealth not evenly distributed LICs depend on HICs for aud. Borrow from world bank causing debt North America 35% of global wealth, Africa 1%
International migration	Migration to countries with higher development e.g. Mexico to USA. Depends on push and pull factors. Money sent home

KI : Various strategies exist for reducing the global development gap

Key terms	Definitions
Development gap	Difference in standards of living and wellbeing between LICs and HICs
Fair trade	When producers in LICs are given a better price for the goods they produce
Intermediate technology	Simple, easily learned and maintained technology used in a range of economic activities serving local needs in LICs
Microfinance loans	Very small loans given to people in LICs to help start a small business

Strategy for reducing the development gap

Investment	Governments, organisations of companies invest in big projects. Provides employment and income leading to development. TNCs from NEEs and HICs inject FDI leading to multiplier effect
Industrial development and tourism	HEP helps economic growth in Africa and Asia. Brings employment, income and opportunities. Investment occurs in housing, education and infrastructure Move from primary products as issues with overproduction and import taxes. Manufacturing goods lead to more profit Tourism leads to investment and more income. Vulnerable to recession.
Aid	Gift (not repaid). Can be funding for development e.g. infrastructure which boosts economy and leads to an increase in quality of life. From countries / IMF / World Bank UK spends 0.7% GDP on aid
Intermediate technology	Comines sophisticated ideas with cheap readily available materials. Local knowledge and tools used e.g. Afridev handpump, solar ovens
Fair Trade	Prevents exploitation with realistic prices and better working conditions. Increases standard of living, health care and education.
Debt relief	Writing off debts / making repayments lower and terms longer IMF / World Bank Highly Indebted Poor Countries Initiative helped 41 countries (mainly in Africa) control their finances, show no government corruption and agree to spend saved money on education, healthcare and decreasing poverty. Tanzania now has free education and Uganda has safe water for 2 million people African countries are over US$300 billion in debt
Microfinance loans	Provided by investors in HICs to entrepreneurs in NEEs and LICs. Many borrowers are women e.g. Glameen Bank in Bangladesh. Vital cash to escape cycle of poverty

EG of how tourism in a LIC can reduce the development gap - Case Study : Jamaica

Reasons for tourism	Beautiful beaches Warm sunny climate Rich cultural heritage Good international air communications Hub for cruise ships
How has it helped?	24% of GDP from tourism (2014) Income from tourism $2 billion Main source of employment – jobs for 200,000 directly or indirectly Provide income for people to spend in shops and on services Quality of life improved for many High level of investment on infrastructure – North Coast
Concerns	Quality of life improved for some – wealthy Jamaicans live in high quality housing but many people live in poor housing, limited food supply etc.. Environmental problems – footpath erosion; excessive waste; harmful emissions Solutions: Conservation and landscape projects – job opportunities, encourage visitors Montego Bay – improved by landscaping; new water treatment plant at Logwood reduced pollution; Negril Marine Nature Park – tourists and income; community tourism and sustainable ecotourism in isolated regions – small scale guest houses

DUAL CODING

Based on some key knowledge from your ***History/ Geography*** knowledge organisers, can you assign different parts of this knowledge to images to help you remember this in the future? Consider your images carefully.

Image	Key Knowledge

Image	Key Knowledge

BRAIN DUMPING

Within the 'brain', add all of the knowledge you can remember from ***History/ Geography*** without looking back at the sheets. Once you have added everything you can remember, look at these pages again and using a different colour pen, add in the knowledge that you missed out. This is the knowledge you should now continue to revise. Continue this process until you can remember everything on the page.

Geog your memory/ Hi-story Lane

Use the LANES to recall key information about a particular topic, from from ***History/ Geography,*** without looking at the sheets. Once you have added everything you can remember, look at these pages again and using a different colour pen, add in the knowledge that you missed out. This is the knowledge you should now continue to revise. Continue this process until you can remember everything on the page.

CRITICAL STUDIES – How To Research Artists

Process/technique: How the work was made.

Context: Background to the work. Could be social/cultural…

Subject matter: What the focus of the work was.

Influences: Friends, styles of art.

Materials/media: With what the work was made.

Personal information: Name, date of birth/death, nationality…

Formal qualities of work:

Style;

Colour;

Representational/abstract;

Mood created/message;

My opinion of the work: Likes and dislikes, what would you like to emulate, be specific!

Art

Eva Hesse

Materials/media: Weird and wonderful materials. New and modern for the time…like plastics and latex (stretchy rubber). She would use anything that she could find. Cloth-covered cord, electrical wire, and masonite, latex and fibre glass. She recycled materials.

Personal information: Born in Germany in 1936.
Jewish.
Family escaped the German Nazis and fled to Holland first and then to England and finally to America where they settled.
Hesse's parents divorced a few years later, sadly her mother committed suicide.
Eva went on to study Art in New York. She became a sculptress.
In 1969, she was diagnosed with a brain tumour. Her death in 1970 at age 34 ended a career spanning only ten years.

Influences: Her art is effected by all the painful struggles of her life including escaping the Nazis, her parents' divorce, the suicide of her mother when she was ten, her failed marriage and the death of her father. She "coped with emotional chaos by reinventing sculpture through playing with worthless material amid the industrial ruins of a defeated nation that, only two decades earlier, would have murdered her without a second thought. She also always felt she was fighting for recognition in a male dominated art world.

Subject matter: Natural forms and the environment. The human condition (being a human). Human body forms.

Context: Eva Hesse was working in a new 'modern' world. Science was creating new and wonderful materials …like plastic. She was inspired by the materials that she used.

Process/technique:
Eva would plan her sculptures in her pencil studies and through exploring and experimenting with materials.

Formal qualities of work:

Style; abstract and expressive

Colour; Pastels

Representational/abstract; Abstract

Art

Eva Hesse - Sculptures

Influences:
Nature.
Her life.

Subject matter:
Natural Forms;
The human Form.

Materials/media:
Fibre Glass;
Latex rubber;
Cardboard;
Paper;
String;
Wire mesh;
Wire.

Process/technique:
Hesse would create ink pen or colour studies recording and exploring natural forms. She would then work from these to create her sculpture reliefs.
Part of the process would be exploring and experimenting with new materials.

Personal information:
Born in Germany 1936.
Jewish.
Escaped the Nazi regime.
Ended up in America.
Died in 1970 at the age of 34 from cancer.

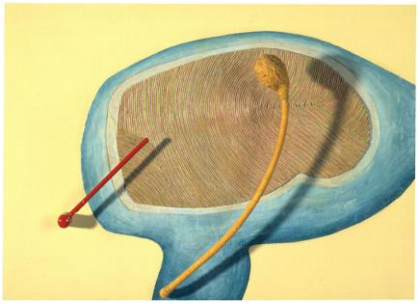
Formal qualities of work:

Style;
Abstract

Colour;
Pastels

Mood created/message;
Exploring what it is to be a natural form.

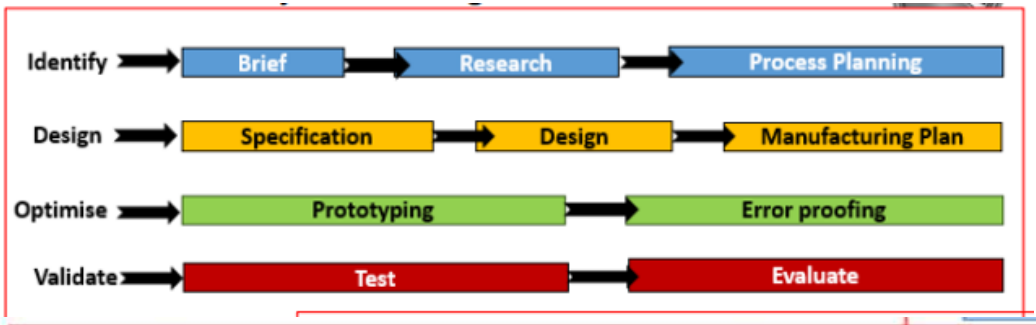
Sculpture Design process:
Extending forms.
Repeating forms.
Removing elements.
Rounded forms.
Dropping down forms.



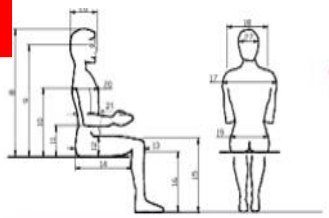
Eva Hesse's work connects beautifully to your GCSE Natural Forms project, due to its connection to nature and the creation of a sculpture relief as a final response to your title.

Context: Background to the work. Could be social/cultural.
Hesse was working at a time when scientists were creating new materials for industries, such as fibre glass and latex. This gave her interesting materials to explore and create her imaginative art with.

DT: Engineering



- A **Design Brief** is a ***statement of how you are going to solve the Design Problem***.
- Research findings and Client feedback can be used to create a **Process Plan.**
- A **Design Specification** is a ***list of requirements your product has to meet in order to be successful.***
- After a Specification has been developed, the **designing** of the product will begin.
- Once the final design has been chosen, a **Manufacturing Plan** is then created.
- **Prototyping** is the creation of a **model or "mock-up"** of a product after the Design Process
- **Error Proofing** is ensuring that the product cannot be assembled or used in an incorrect way
- **Testing** and **Evaluation** happens because designers need to ensure the product is successful before being released, and is competitive with the market.



Anthropometrics is the ***study of measurements of the human body***
Ergonomics is the ***application of anthropometrics in order to make products and places efficient, comfortable and safe to use***

Technology Push is when *new developments in materials and technologies improve existing products/ create new ones*
Market Pull is when consumers demand improvements/new products. Often found by conducting market research →

Mass Production (High-Volume Production)
This is where large quantities of products are made (10,000s-100,000s)
There are often assembly lines (for the main product) and sub-assembly (for small pieces and components)

Continuous Production
This is when large quantities of products is produced (100,000s +)
However, unlike Mass Production this is **never ending** production e.g. power plants

One-off Production
This is the manufacture of **one item**
This item can be custom made/ designed (bespoke manufacture)

SPECIAL EDITION CAR

KNOCKDOWN FURNITURE

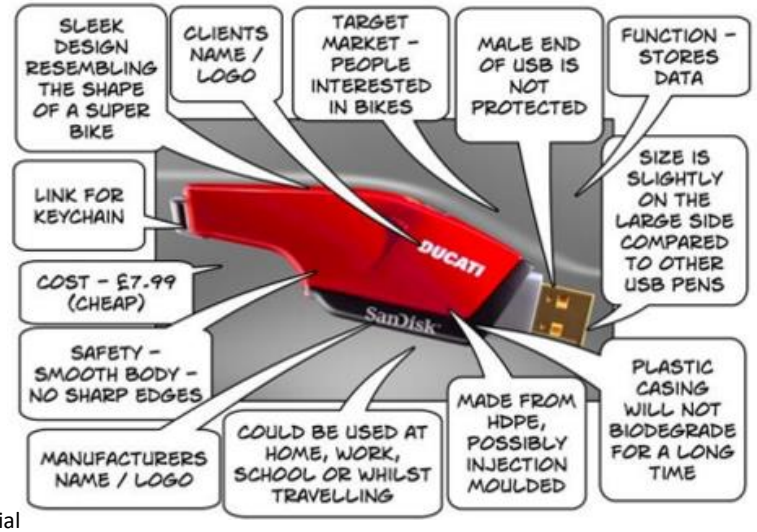
Batch Production
This is where small quantities of identical items are made (10s-1000s)
To ensure all items are identical, jigs, moulds and templates to aid workers

Just-in-time production (JIT)
This is when products made to order, but can be used in conjunction with any other scale of production

Aesthetics – What the product looks like, style, colour etc;
Customer – Who is the target market, how it will appeal to them, what Anthropometrics/ ergonomics will be used;
Cost – cost to make, cost to sell;
Environment – where it will be used, is it sustainable;
Safety – how it will be safe to use, what standards and regulations it meets;
Size – what dimensions it will be, as well as components and parts;
Function – what the purpose of the product will be and what features it has;
Materials – what it is made from;
Manufacture- how it will be made.

Product requirements are what a product has to meet/ must do.
Common requirements are:

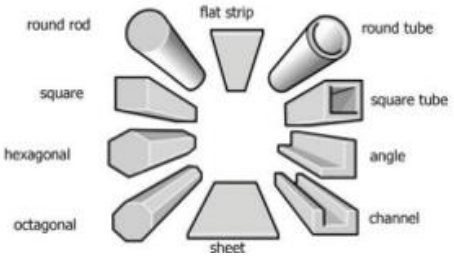
- Features – *what makes a product unique and sellable*
- Performance – *how well it completes its function*
- Target Market – *how it appeals to its customers*
- Working Environment – *how it is suitable for where it will be used*
- Constraints – *what is must do or must not do*
- Ergonomics – *how its comfortable and safe to use*
- Lifecycle – *what environmental impact it makes (and how that can be reduced)*



Personal Protective Equipment

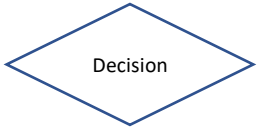
A stock form is when a raw material has been processed into a standard size, shape or form.

Stock Forms



Standard component is a usually an individual part, manufactured in thousands, to the same specification. These are often bought in bulk and saves companies money, rather than them making them themselves. The sizes are usually internationally recognised.

Flowcharts



Disassembly – when referring to hardware, disassemble is the process of breaking down a device into separate parts. A device may be disassembled to help determine a problem, to replace a part, or to take the parts and use them elsewhere.

Planned consideration

When manufacturing, the following should be considered:

- Standard components
- Stock forms
- Supply chains
- Durability and maintenance
- Product safety
- Cost and budget

Aesthetics – What the product looks like, style, colour etc;
Customer – Who is the target market, how it will appeal to them, what Anthropometrics/ ergonomics will be used;
Cost – cost to make, cost to sell;
Environment – where it will be used, is it sustainable;
Safety – how it will be safe to use, what standards and regulations it meets;
Size – what dimensions it will be, as well as components and parts;
Function – what the purpose of the product will be and what features it has;
Materials – what it is made from;
Manufacture- how it will be made.

Modelling is used to test:


Scale


Proportion


Function

Types of modelling


Virtual


Physical

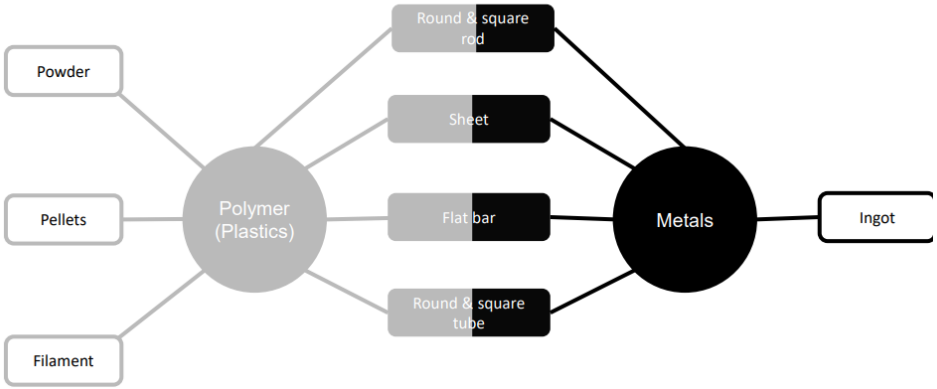
Evaluation of model

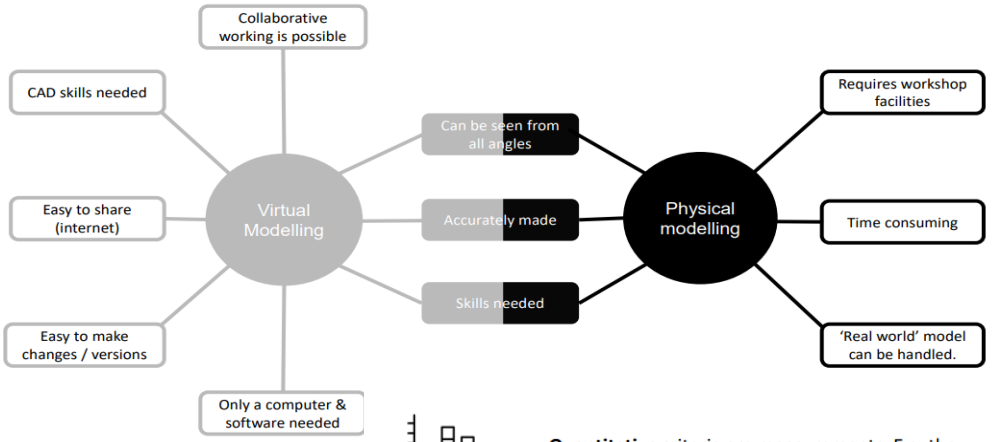
All models or prototypes are compared with the design **brief** and **specification**.

In **iterative** design, this leads to an **improved design** which is then modelled.

Wasting	Shaping	Forming	Joining	Finishing	Assembly
					
Changing shape by removing material	Forming a shape by moulding or laying up composites.	Changing shape by deformation.	Permenant or temporary fixing.	Creating a surface finish for technical or aesthetic reasons.	Adding components together into a single product.

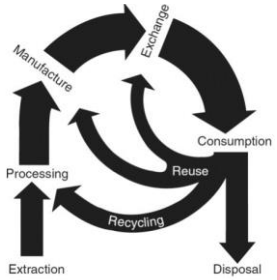
Polymers and metals have some stock forms in common.
Other materials have their own standard stock forms.

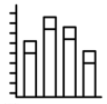




Circular Economy

In a circular economy, products, components and materials are reused and recycled instead of being thrown away





Quantitative criteria are measurements. E.g. the amount of memory in a phone or the capacity of a battery.

Qualitative data are based on opinions, impressions and points of view. E.g. how comfortable a handle should be or how attractive a bath tap must be.

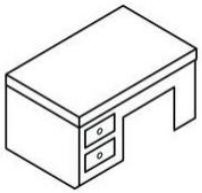
Needs criteria are essential and must be included in a design. E.g. an emergency stop button on a machine.

Wants are criteria that are not essential but desirable. E.g. 1950s aesthetic styling on a food mixer.

	Buildings	Capital cost
	Equipment	
	Workers	Labour cost

Isometric

A formal 3D style drawing.



Start at the corner all lines projected back at 30◦

Oblique

Another 3D style that is less realistic that isometric.

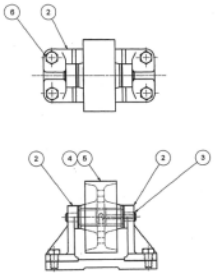
Start with front 'face' then project back at 45◦

Freehand sketching

An informal style used to communicate ideas quickly.

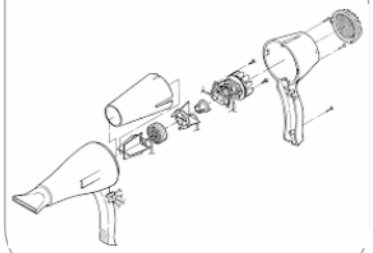
Assembly Drawings

Drawings that show all components assembled together.



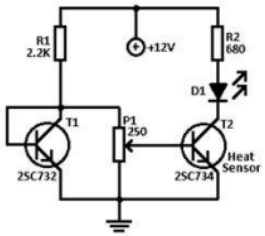
Exploded views

A type of assembly drawings that shows space between parts.



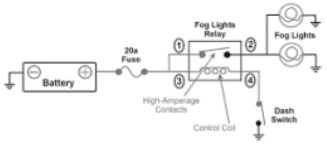
Circuit Diagram

Used to show how electronic components are connected in a circuit.



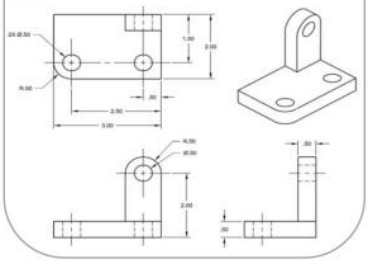
Wiring Diagram

Shows how connections should be made within larger electrical systems.



Orthographic drawing

A formal style of 2D drawing usually used to show dimensions. Drawn to scale.

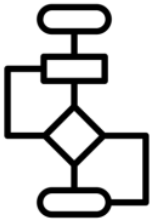


Block diagrams

A diagram of a system showing how stages relate to each other.

Flowcharts

Used to show a decision making process.



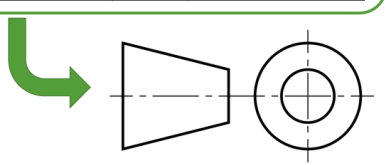
Working Drawings

Outline		Tolerance	
Centre Line		3rd Angle	
Dimension Line		External Thread	
Hidden Detail		Internal Thread	
Projection		Knurl	
Leader Line		Blind Hole	
Diameter	∅	Chamfer	
		Countersink	
		Through Hole	

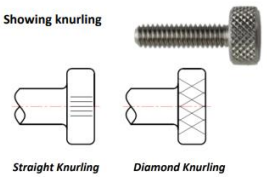
Across Flats	AF
Centre Line	CL
Diameter	DIA, D and Ø
Drawing	DRG
Material	MATL
Square	SQ

Title block example

Title:	Desk lamp base	Date:	19/1/23	Drawn by:	P Miles
Scale:	1:1	Version:	3	Tolerance:	± 0.2 unless stated otherwise
All dimensions in millimetres					



Showing knurling



A/F	Across flats
CL	Centre line
Ø	Diameter
DRG	Drawing
MATL	Material
SQ	Square

Fabric manipulation: Making textile manipulations (or fabric manipulations) is **playing with the fabric to change its appearance, drape or shape**. Usually, we want the fabric to become more dimensional, to go from flat to 3D.









Analysing the work of an Artist/Fashion designer:

Use the following headings when analysing the work of your chosen Artist/Fashion designer:

1. First impressions: Record your reactions and thoughts of the artwork.
2. What materials and processes have been used? Write a paragraph describing everything you see: colour, pattern, texture, line, shape, material or anything else interesting.
3. Background information about the Artist: The name of the artist, the title of the artwork. People, events, movements, concepts they have been influenced by.
4. Meaning – what mood or feeling do you get from the work and how has the artist created this?
5. What do you think of it? Describe some of the following things: What you particularly like about the work, what the artist has done well, what you would change about the artwork, what 2-3 questions would you like to ask the artist about the work and what ideas has the artwork given you for your own work.
6. Last thoughts. Using all the information you have gathered, explain if your views have changed.
7. Compare 2 pieces of work –either between work of the same artist or another artist. Describe the main similarities and differences.

Quilting is a method of stitching layers of material together. A quilt usually means a bed cover, using 2 layers of fabric stitched together with a layer of wadding in the middle. There is usually a design stitched onto the surface of the fabric to create a design. There are 3 main types of quilting:

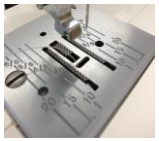
Free machine embroidery- this is where you drop the feed dogs into the machine and move the fabric freely as it stitches. It is creative and allows you to stitch freely – often called 'drawing with stitches'.


Embroidery ring

Embroidery foot

Machine embroidery thread

Interfacing is used on the back of most fabrics to stabilise it for this technique



Feed dogs to be dropped to allow the fabric to be moved freely







Trapunto quilting uses 2 layers of fabric – designs stitched through the layers and then the backing layer is cut open and stuffing is added between the 2 layers to pad the fabric.



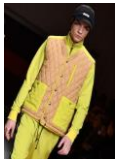

Italian quilting also uses 2 layers of fabric – designs are stitched through the layers in parallel narrow lines. Italian wool is then threaded through the stitched lines to create padded lines.



English quilting is the most common and popular type of quilting. This also uses 2 layers of fabric with a layer of wadding in between the 2 layers. Designs are stitched through the 3 layers, usually in lines to create a typical English quilted effect.





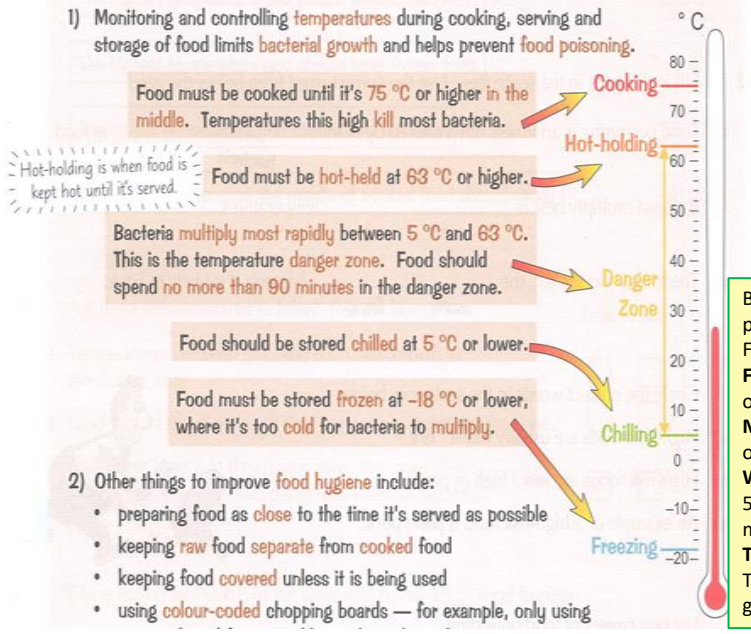





Catering

AC4.1, 4.4 & 4.5	• Describe food related sources of ill heath • Describe common types of food poisoning • Describe the symptoms of food induced ill health

Key Terms	
Bacteria	microscopic organisms that can cause food poisoning
Contaminate	food that has come into contact with microbes and become unsafe to eat
Cross-contamination	microbes spreading from first to first
Food spoilage	when food becomes unfit or unsafe to eat
Micro-organism	tiny plants and animals that can only be seen under a microscope
Mould	tiny organisms, related to mushrooms
Pathogenic	something that is capable of causing illness
Toxins	another name for poisons
Yeasts	single-celled fungi that ferments food
Allergen	something that causes an allergy
Anaphylaxis	a potentially life threatening reaction to food
Food Allergy	a condition where food reacts with the body's immune system
Food Intolerance	a condition where food reacts with the body's digestive system



Where micro-organisms are found:	Non-visible symptoms (Food Poisoning)	Visible symptoms (Food Poisoning)
Food packaging, soil, sewage, untreated water, air, clothing, dirty, rubbish, surfaces, equipment, in and on people, in and on animals, insects and birds, food	• Headache, weakness, feeling cold, stomach ache, feeling sick, loss of appetite, aching muscles	• Diarrhoea, high temperature, being sick, dizziness

Bacillus Cereus	Campylobacter	Clostridium	Listeria	Salmonella	Staphylococcus
• Soil • Rice • Pasta	• Unclean water • Dairy • Milk • Meat • Poultry	• Raw meat • Raw poultry	• Ready-to-eat meat • Soft cheese • Raw sprouts	• Faeces • Meat • Poultry • Raw eggs	• Sneezing • Coughing • Not washing hands
• Cramps • Vomiting	• Temperature • Vomiting • Cramps	• Cramps	• Flu like	• Cramps • Vomiting • Flu like	• Cramps • Sickness • Nausea

Food Allergies

Foods: eggs, milk, fish, peanuts, other nuts, seeds, citrus, soya, strawberries, kiwi, mustard, celery, sulphur, mustard

Visible symptoms
- Red skin, hives, swelling, difficulty

Non-visible symptoms
- Difficulty breathing
- Pain in stomach
- May collapse

Food intolerances

Lactose intolerance = dairy
Coeliac disease = wheat

Muscle and joint pain, bloating, nausea, tiredness, diarrhoea, eczema

Bacteria can grow rapidly in the correct conditions. A single **bacterium** can divide into two by the process called **binary fission.** A single bacterium can produce 16 million bacteria in only 12 hours.
Food poisoning bacteria have four essential requirements for growth:
Food- bacteria grow rapidly in high risk foods that are good sources of protein; such as cooked meat and poultry, shellfish, and seafood, undercooked or lightly cooked eggs, unpasteurised milk and cheeses, cooked rice and pasta, and salads.
Moisture- bacteria cannot multiply without moisture, which means that they do not usually affect dried foods or products with high quantities of salt or sugar, which absorb water.
Warmth- most bacteria multiply at **ambient temperature** -normal room temperature. This falls within the danger zone between 5˚C and 63˚ C. Below 5˚C most bacteria are unable to multiply rapidly, and below -18˚C they become **dormant**. Cooking food at high temperatures above 63˚C will destroy most bacteria; when cooked, the food should reach 75˚C for at least two minutes.
Time- in the right conditions the number of bacteria can double every 20 minutes.
The acidity and alkalinity of a food can influence the growth of bacteria. If conditions are too acidic or to alkaline, bacteria can not grow.

Catering

AC4.2 & 4.3	• Describe the role and responsibilities of EHO's • Describe food safety legislation

Key Terms	
Critical control points	stages in a food production operation where food safety could go wrong
Due diligence	being able to prove that reasonable actions to avoid a health risk have been taken
Hazard Analysis Critical Control Points (HACCP)	a food safety management system to identify hazards to food safety

How does legislation protect food businesses?	How does legislation protect consumers?
• Making sure all food handlers are trained • Making sure working conditions are good • Preventing consumers making false claims	• Helping prevent food induced ill health • Ensuring highest standards • Providing a way to prosecute food businesses who break the law

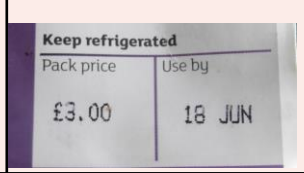
All the following sectors in the industry are covered by legislation:

Food production 	Farmers, crop pickers, fishing boats
Food processing and product manufacture 	Dairies, mills, washing and packing etc.
Warehouse storage and food distribution 	Warehouses, deliver vans and lorries
Preparation and sale of food 	Supermarkets, restaurants, cafes, hotels, markets, street food, schools, pubs, hospitals, prisons etc.

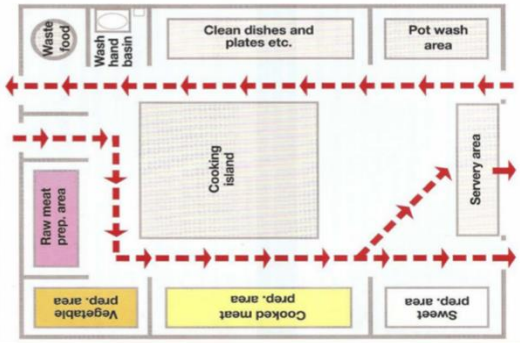
The Food Safety Act 1990	Food Hygiene Regulations	Food Labelling Regulations
Applies to *all* food businesses. It ensures that food is: • Safe to eat • What people expect it to be • Not labelled, advertised or presented in a misleading way	Applies to all food and drink, their ingredients including when it was made 1. The food has been handled hygienically 2. Identify food hazards 3. Critical safety points (HACCP) 4. What controls to put in place 5. Ensure they are put in place and maintained	• Name of food • Ingredients • Quantity of ingredients • Quantity of food • Use by date • Storage conditions • Name of business and address • Country of origin • Instructions • Nutritional declaration
FOOD STANDARDS AGENCY		

Responsibilities of food premises	Responsibility of food handlers
• Be clean and in good repair • Be designed and built that allows hygiene practices • Have a sufficient supply of drinking water • Have suitable controls in place for pests • Have natural and artificial lighting • Have natural or mechanical ventilation • Provide clean staff toilets • Proper hand washing facilities • Enough drainage • Easily disinfected surfaces • Proper food waste facilities • Enough space 	• Always wash your hands (before handling food, after going the toilet, coming in from outside, after coughing, sneezing, toughing money, handling rubbish., touching animals, handling raw eggs and meat) • Tell your employer if you are ill or have any infections • Keep good hygiene and cleanliness • Do not smoke in food room • Clear as you go • Use very hot water to clean dishcloths and tea towels to dry • Prepare raw food with separate equipment • Keep hands off food for as long as possible • Make sure that waste is disposed of properly • Tell your employer if you cannot follow the rules.

Environmental Health Officers (EHO)

Purpose is to make sure that:	What they do in an inspection:
• Food is being stored, handled and cooked hygienically • Food is not contaminated • Food handlers have been trained • Food handlers are aware of importance of personal hygiene • There are control measures in place to prevent pests • The premises is in good condition and clean • Make sure hazards are identified and managed through HACCP • Offer advice and training improving food safety	• Check use-by and best-before dates on food • Check equipment used for preparation, cooking and storing is clean and working properly • Check for evidence of pest and pest control • Check the cleanliness of the kitchen and storerooms • Watch how food handlers prepare food • Inspect food waste systems • Check paperwork and records kept by business
They can: • Enter without warning • Inspect any food premises • Take food samples for testing • Take photographs as evidence • Look at data and records • Take food so it cannot be sold • Tell the owners to make improvements • Close the premises • Give evidence in court against a business 	 
 	

Workflow in the kitchen should follow a logical process by using different areas so that the clean stages in food production never come into contact with the "dirty" stages.



You need to consider the following key areas in terms of layout…

1. Delivery
2. Storage
3. Food preparation
4. Cooking
5. Holding
6. Food service area
7. Wash up
8. Waste disposal

DRESS CODE

A chef's uniform is more than a fashion statement. Each component plays a specific role in protecting from potential dangers common in most kitchens

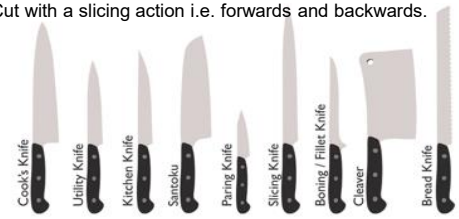
Chef's uniform

- Chef's jacket
- Chef's pants
- Hat
- Neckerchief
- Apron
- Hand towel
- Slip-resistant shoes

- Some establishments have staff wear the same uniform; this makes them easily identifiable for staff and customers. The uniform may change depending on which area of the establishment they work in.
- Protective clothing as part of a uniform must be paid for by the employer.

KNIVES

1.Store knives safely so you don't cut yourself accidentally
2.Clean knives after each use. gently scrub the knife, then wash it off with hot water. Dry with a clean cloth
3. Make sure knives are sharp.
4.Use knives for the purpose that they were intended.
5.Cut with a slicing action i.e. forwards and backwards.



STOCK CONTROL

2 types of foods when it comes to stock control:

Perishable food and products that do not stay fresh for very long

- Fresh fruit, vegetables
- Dairy products
- Meat and fish
- Only buy enough to last a few days because they will not last

Staple foods and supplies that are canned, bottled, dried or frozen These have a longer shelf life and so do not need to be purchased as frequently. Larger amounts can be bought to get cheaper prices and can be stored .

- Condiments,
- Canned vegetables
- Frozen foods including meat, fish and deserts
- Sauces
- Flour, sugar, fat,oil

Remember

1. **FIFO – First In First Out rule.**
2. **Check use by/best before dates and make sure you stick to these. Do not use something if it is past its use by date.**
3. **Keep food that an cause an allergic reaction separate from all other food.**

DOCUMENTATION

Why must they be completed?

1. Maintaining organisational procedures
2. Safety of staff and customers
3. Legal requirements
4. Complying with food safety legislation
5. Complying with accounting and taxation practices

Stock control
Monitor stock levels for re ordering
Decide frequency of stock check
First in First out for items with a shelf life

Personnel records
Hours worked
Personal details
Wages
Taxation
National insurance
Training
Accidents
Staff rotas and timetables

Health and safety, hygiene
Fire certificate
Staff training records
Accident book
Food hygiene checks
Cleaning checks

Bookings and reservations
Electronic booking system
Electronic reservations system
Diary with bookings and reservations
Feedback forms

Purchasing
Food and drink orders
Packaging orders
Equipment
Tables, chairs etc.
Cutlery and crockery
Staff uniforms

Financial
Income tax
VAT
Wages
Insurance
Sales and income
Staff costs
Heating, lighting

CUSTOMER REQUIREMENTS

Customer service is what an establishment does in order to meet the **expectations** of their customers and generate customer satisfaction.

- **So customers return**.- People will not return to a place where they were not satisfied with the service. Repeat business means a successful business.
- **Exceeding expectations-**This makes repeat business more likely
- **Growth of the business-** If customers receive a high standard of service ad return, they will spend more money and also tell other people about the business.

Customers are influenced by:

- TV
- Magazines
- Health
- Travel abroad
- Technology
- Ratings and reviews
- Amount of money service is

Types of Customer

Leisure	Local residents	Business / corporate
Customers who visit the establishments in their leisure time e.g. a meal with friends, a family day out, tourists,	Customers who live in the local area who visit the establishment often eg regular Sunday lunch, or get togethers	e.g. business lunches. Use business facilities in establishment for meetings or presentations. Courses and conferences

Leisure customers' requirements

- Value for money
- Good facilities
- Families want child menus, play area, child friendly
- Tourists want local food, easy to communicate
- Older people may want more formal service
- Good customer service
- Varied choice of menu
- Dietary needs e.g. allergies, intolerances, vegetarian catered for without having to ask for special foods
- Facilities for physically impaired customers

Local customers' requirements

- Value for money
- good standard of customer service so they return
- Catering for local needs (culture, religion)
- Consistent dishes served
- Loyalty schemes
- Recognised by staff- feel welcome
- Menu specials
- Theme nights
- OAP discount day
- Child friendly
- Entertainment
- Mailing list or email for special offers

Business customers requirements

- Dedicated corporate (business) contact at establishment
- Discounted rates
- Meeting rooms
- Water, juice on tables
- Presentation equipment, Tea and coffee for breaks
- Lunch or other meals- buffet or restaurant
- Accommodation if attendees are from a long distance
- Quick service for lunch meetings

Small Equipment – you will need to know what each piece of equipment is used for.

Large Equipment – you will need to know what each piece of equipment is used for.

Deep Fat Fryer

- Check the level of oil is above the heater coils.
- Avoid spilling any water in the oil.
- Do not overheat the oil..

Grill/Salamander
Ensure the tray beneath the bars are clean.

- Switch off electrical supply and clean the bars thoroughly, as well as the top.
- Do not clean when hot.

Free Standing Mixer
Ensure the parts underneath the arm are cleaned

- Switch off electrical supply and clean the blade/whisk thoroughly, as well as the top.
- Do not clean when moving

Bain Marie
Ensure there is water at all times when the Bain Marie is on.

- Do not let the water boil vigorously.
- Refill with clean water

Hot Plate

- Avoid spilling water on surface
- switch off parts, which are not being used.
- Cool hot plates before cleaning

A to Z of...

Based on your ***OPTION SUBJECT***, recall any key information from the current topic you have been studying.

A	B	C	D
E	F	G	H
I	J	K	L
M	N	O	P
Q	R	S	T
U	V	W	X
Y	Z		

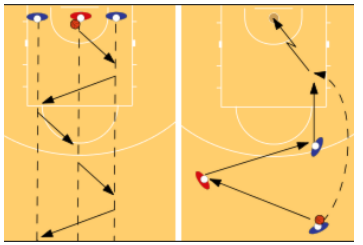
Unit R185 – Performance and Leadership in Sports Activities

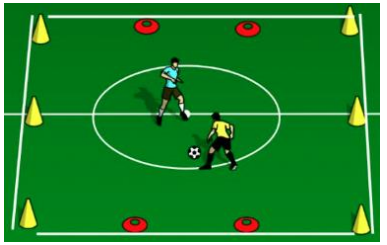
Log Book Exemplar

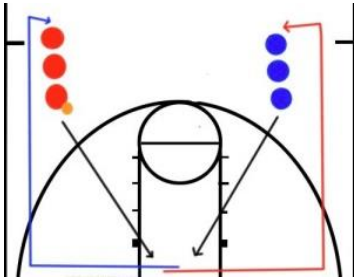
Activity	Badminton

Date	Level of competition	Role/position/ events	Notes
7/11	PE lesson		Worked on service drills. Games at end won 7-3 and lost 4-7 and 2-7.
14/11	PE lesson		Tactics on serving lesson. While I understand I remain focused on a long high serve. Games at end won 7-5 and 7-4.
21/11	PE lesson		Overhead clear drills. I struggle with generating enough power to be effective. Games at end lost 3-7 and 4-7 and won 7-2.
28/11	PE lesson		Underarm clears/lifts drills. Find these easier and was more successful in shot completion.

Activity	Football		
3/12	League game	RB v Torquay W 4-2	Played whole game. Crossed for one goal and took corner where we also scored from.
6/12	School club		
9/12	Club training		
10/12	League game	RB v Derby L 2-1	Got substituted at 1-1 with 15 minutes left.







Review of strengths and weaknesses in key components for the sport.

My current level of ability in squash

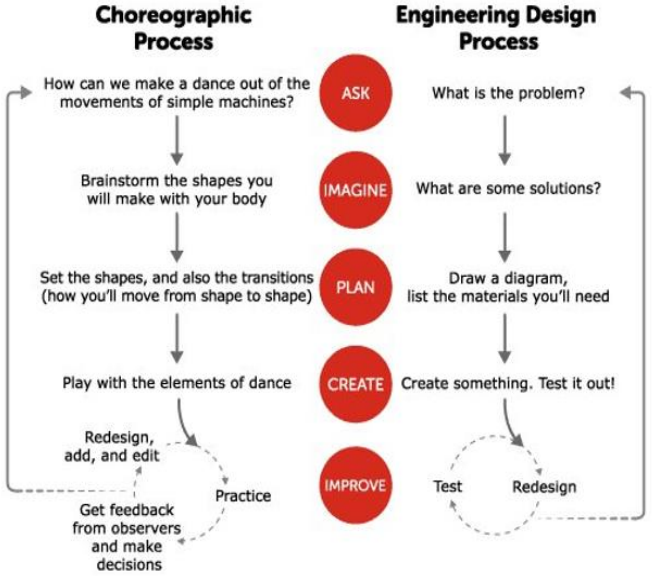
Skills and techniques	Strengths	Weaknesses
Serving	X	
Return of serve	X	
Drives	X	
Boasts	X	
Volleys		X
Drop shots		X
Lobs	X	
Kill shots		X
Footwork and court positioning		X

Strength 1

I think that my serving and return of serve are good strengths to have because if I can put the opponent under pressure from the start of each point and take control, this means they have to move more than me. This is important in a game because you are moving less and tiring your opponent out, giving you an advantage.

Weakness 1

My last weakness is that I also don't have a good range and variation of kill shots or drop shots. I normally hit the T which means I'm limited in being able to make my opponents have to move around the court again meaning they don't have to move far to play their shot. If I could play them especially from the back of court, it would make them run further and mean I could disguise the shot I'm going to play more effectively which means I could increase my chance of winning.



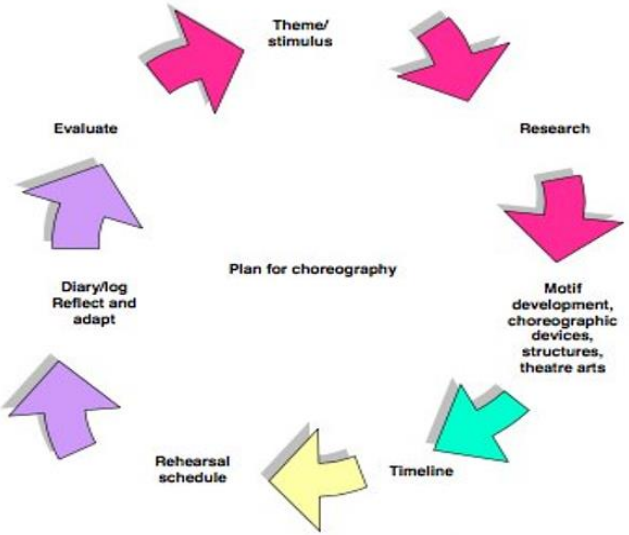
Dance Year 10

Ghost Dances, one of the dance company Rambert's most-loved pieces, still works its spell. Created in 1981, **inspired by the oppression of the Pinochet regime in Chile.**

Christopher Bruce's work conjures up a community under pressure. It's part of a Latin-flavored triple bill that takes different approaches to storytelling and shows how vividly Rambert's fine dancers engage with their audience.

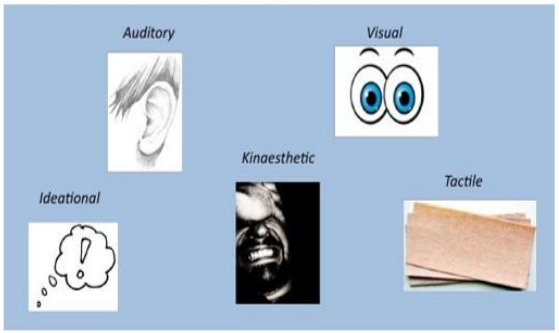
With every performance **ZooNation** make, their goal is to entertain an audience, but it is always combined with the desire to provoke thought, challenge viewpoints, raise awareness and celebrate equality.

In **The Mad Hatter's Tea Party**, we particularly looked at **raising awareness about mental health in today's society**. Choreographer Kate Prince was influenced by her personal mental health challenges in the past and the shame and embarrassment she felt about discussing them, she thought this show was a way of **confronting the stigma around mental health**.



Stimulus = Starting point to create a dance.

- Visual = What we see
- Auditory = What we hear
- Kinaesthetic = Movement
- Tactile – What we touch
- Ideational = Ideas



Dance Vocabulary

What? - Action

Travel	*Run, skip, hop, crawl etc*
Stillness	*Freeze; as still as a statue*
Jump	*Forwards, low, change of shape, leaps, etc*
Turn	*Half, full, quarter, spin, spiral etc*
Gesture	*Stamp, punch, reach, lean wave etc.*
Change of Weight	*Leaning, tilting, stretching.*

Where? - Space

Levels	*High, middle, low.*
Directions	*Forwards, backwards, up, down, pathways - circular, zig zag*
Shape	*Wide, straight, tucked, symmetrical, Asymmetrical*
Space	*personal, shared, general*

How? - Dynamics

Time	*Fast, slow, sudden, sustained*
Force	*Weight and flow. Strong, light, heavy, delicate, firm etc, free -without restriction bound - restricted*

With Whom? - Relationship

Individual	*solo*
Group	*Duo, trio, 4+ etc*
Stimulus	*Music, poem, sculpture etc*
Prop	*Chair, scarf, umbrella etc.*
Music	*Relationship to music and beat*
Audience	*Relationship and interaction with audience*

Unit RO34: Creative and therapeutic activities: **Topic Area 2: Creative activities and their benefits**

Physical activities improve fine and gross motor skills as well as circulation and fitness.

Benefits- It improves:

- Dexterity
- Strength
- Hand eye coordination
- Agility
- Mobility
- Balance
- Fitness
- Breathing
- Pain management
- Relaxation
- Sleep and appetite

Reduction of pain and discomfort such as swollen ankles and legs

Intellectual activities improve mental stimulation, creative skills and encourages working independently. It also helps with communication and language skills.

Benefits

- Prevent/slow memory loss
- Maintain and improve memory and concentration
- Relieve boredom
- Learn new skills
- Ability to make own choices
- Problem solving
- Improved imagination
- Development of life skills
- Improved verbal and written communication
- Improved speech
- Improved listening skills

Emotional activities is expressing emotions through visual, spoken or other forms.

Benefits

- Feeling valued
- Feeling empowered
- Improved confidence and self-worth
- Improved motivation
- Sense of achievement
- Develop new interests
- Improved emotional stability
- Helps to express emotions
- Reduces anxiety and low mood
- Relieves tension and stress
- Improves positive mental well-being

Unit RO34: Creative and therapeutic activities: **Topic Area 2: Creative activities and their benefits**

Social/moral activities is activities that involves two or more people interacting.

Benefits

- Improved relationships
- Developing new friendships
- Improves engagement
- Learning right from wrong
- Learning new rules
- Preparing children for school
- Reduction in boredom
- Sharing experiences and staying connected with friends
- Improve communication
- Problem solving
- Maintain and improve memory

Sensory activities use materials that stimulate the five senses (touch, taste, smell, hear, see)

Benefits

- Improve fine motor skills
- Reduce stress and tension
- Improve concentration
- Develop new interests
- Improve engagement
- Sense of achievement
- Mental stimulation
- Learn new skills
- Hand eye coordination improved
- Relaxing
- Reduce boredom

Imaginative activities is displaying or stimulating ideas and thoughts in different ways

Benefits

- Improved fine motor skills (drawing or writing)
- Reduce tension
- Reduced stress and anxiety
- Improved sleep
- Maintain and improve memory (drama)
- Mental stimulation
- Learn new skills
- Improve communication
- Improve concentration
- Make and develop friendships
- Reduces boredom
- Increased engagement

Roll-a-dice Revision

Based on your ***OPTION SUBJECT***, create questions for each square on the grid. Once you're done, take it in turns to roll two dice and answer the corresponding questions.

	1	2	3	4	5	6
1						
2						
3						
4						
5						
6						

Business Studies

Meeting customer needs and wants

A business is successful if it can meet the needs and wants of its customers effectively. A **need** is a basic human requirement such as food and drink. A **want** is the desire for a particular product such as the desire to drive a Ferrari.

The Business Environment

A business will compete against other businesses. The competitive environment describes how much competition exists and how businesses compete against each other.

In the supermarket industry, for example, there are few supermarket companies (mainly Tesco, Sainsburys, Asda, Morrisons, Aldi and Lidl) but they compete very aggressively against each other with price wars and regular discounts.

The Dynamic Environment

The business environment is constantly changing – it is **dynamic**. Look at any newspaper or any news website and you will see how much change there is – changes in incomes, changes in the number of people working, new laws, new competitors and much more. A business has to keep adapting.

You may once have made money from selling typewriters but you would struggle to do so these days. Businesses cannot stay still. They need to change.

Businesses can also be classified in terms of:

- **The private sector**: this refers to businesses that are owned by private individuals. Typically, profit is the objective of these businesses.
- **The public sector**: this refers to organizations owned by the government such as the NHS and state school. These organisations often have social objectives – they aim to help society.

Functions of a Business

A business transforms resources into outputs.

To be successful it must **understand its customers effectively** and make sure that it **provides products that are in demand**. It needs to think about the **nature of the product**, **how to promote the benefits** of the product to potential customers, **what price to set** and **how and where customers will want to buy it**.

These activities are all part of the **marketing function**.

The business must produce the good or service.

In some cases, there may only be one person in the business, but some organisations have hundreds or thousands of people working for them. Managing people (for example recruiting and training staff and deciding ow to reward them) is known as the **Human Resources function**.

A business will also have to manage **money**.

It may need to raise finance. It will need to monitor what is spent in different parts of the business and calculate if the business has sufficient funds. These activities are part of the **Finance function.**

A business will have to manage **stock and raw materials**

A business will need to consider which products it produces and when. It will need to ensure that it has the necessary raw materials to produce these goods and that they have the necessary equipment. This is part of the **Operations Function.**

The interdependent nature of business activity

The functions of a business are **interdependent.** This means they are linked to each other and changes in one can affect the others.

For example, if marketing generates more sales this may require more production from operations. This may require longer hours from staff or even more employees being taken on (human resources). If the revenue from the extra sales covers these costs this will lead to more profits (finance).

Knowledge Organiser 9 : Algorithms

1. Computational Thinking

Abstraction	The process of removing unnecessary details and including only the relevant details.It is a method of computational thinking that focusses on what is important in problem solving
Decomposition	The process of breaking a complex problem down into smaller more manageable parts. Dealing with many different stages of a problem at once is much more difficult than breaking a problem down into a number of smaller problems and solving each, one at time.
Advantages of Program Decomposition	• Makes problems easier to solve. Different people can work on different parts of a problem at the same time… • …reducing development time. • Program components developed in one program can easily be used in other programs
Algorithmic Thinking	A way of getting to a solution by identifying the individual steps needed. By creating a set of rules, an algorithm that is followed precisely, leads to an answer. Algorithmic thinking allows solutions to be automated.

2. Input Processes and Output

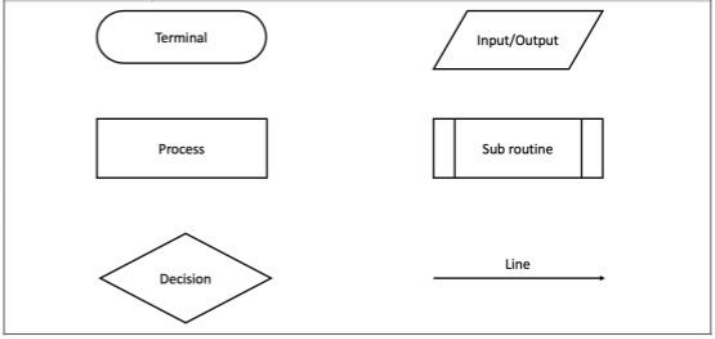
Inputs	• Anything which needs to be supplied to the program so it can meet its goals. • Often input by the user. • Consider an appropriate variable name and data type for the input.
Processes	• Consider what calculations need to be performed while the program is running. • Does data need to change formats or data types
Outputs	• Consider what your program need to output. • Consider what form this output need to take. • Consider an appropriate variable name and data type for any output

3. Structure Diagrams

- Structure diagrams illustrate problem decomposition.
- They can be used for developers to understand a problem to code and to share with users during systems analysis.
- They are produced using a method known as step-wise refinement.
- Break problem down using decomposition into ever smaller components.
- Some areas of the program will needed breaking down more than others.
- The lowest level nodes should achieve a single task.
- These can then be coded as a single module or sub-program.

3. Flowcharts, Pseudocode and OCR Reference Language

Flowchart	A method of representing the sequences of steps in an algorithm in the form of a diagram. Sometimes called a Flow diagram
Energy	2% of global energy consumption is used by data centres
Pseudocode	A text based alternative of representing the sequences of steps in an algorithm. Pseudo-code can be thought of as a simplified form of programming code.
OCR Reference Language	You must be able to read this but you can always use Python in your exams–but be precise



4. Types of Errors

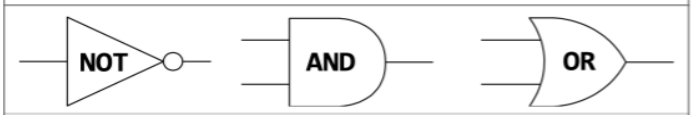
Syntax Error	Syntax errors are errors which break the grammatical rules of the programming language. They stop it from being run/translated
Logic Errors	Logic errors are errors which produce unexpected output. On their own they won't stop the program running

5. Trace Tables

- A vital skill for understanding program flow and testing the accuracy of an algorithm for logic is called "Tracing Execution".
- Examine a printed extract of program code and running thorough the program.
- Take each line at a time and write out in a trace table the current state of each variable. Noting down any output the program produces.
- Each variable present in the program should have its own column in the trace table.
- A new row should be added under any column if the state of a variable changes.
- Trace tables are an excellent way to track down logic errors in a problem.

Knowledge Organiser 14 : Boolean logic, Programming Languages and IDEs

1. Logic Gate Symbols



~A A ^ B A & B A v B A | B

2. Truth Tables

A	NOT A
0	1
1	0

A	B	A AND B
0	0	0
0	1	0
1	0	0
1	1	1

A	B	A OR B
0	0	0
0	1	1
1	0	1
1	1	1

4. Translators

Assembler	Assembles' assembly language into machine code. Translates the whole code before execution
Compiler	Translates source code from high-level languages into object code and then into machine code ready to be processed by the CPU. The whole program is translated into machine code before it is run.
Compiler Advantages	• No need for translation software at run-time, and no need to share original source code • Speed of execution is faster because code is usually optimised.
Complier Disadvantages	• You cannot compile the program if there are syntax errors anywhere in it which can make it tricky to debug. • If you change anything you need to recompile the code
Interpreter	Translates source code from high level languages into machine code ready to be processed by the CPU. The program is translated line by line as the program is running.
Interpreter Advantages	• Easy to write source code because the program will always run, stopping when it finds a syntax error. • Code does not need to be recompiled when code is changed, and it is easy to try out commands when the program has paused after finding an error.
Interpreter Disadvantages	• Translation software is needed at run-time, so you beed to share the original source code. • Speed of execution is slower because the code is not optimised

3. Levels of Programming Languages

Machine Code 1st Generation	• Binary representation of instructions in a format that the CPU can decode and execute. • Have an operation code (opcode) instruction and address or data to use (operand).
Low-Level Languages 2nd Generation	• Written in Assembly language. • Translated by an assembler into machine code. • Used for embedded systems and device drivers where instructing the hardware directly is necessary. • One instruction translated into one machine code instruction. • The code works on one type of processor only. • The programmer works with memory directly. • Code is harder to write and understand. • Memory efficient. • Code is fast to execute.
High-Level Languages 3rd Generation	• Source code is written in languages as Python, C++. • Translated by a compiler or interpreter into machine code. • Makes the writing of computer programs easier by using commands that are like English. • One source code instruction translates to many machine code instructions. • Code will run on different types of processors. • The programmer has lots of data structures to use. • Code is quicker and easier to understand and write. • Less memory efficient. • Code can be slower to execute if it is not optimised.

5. Integrated Development Environments

Debugging Tools	• Breakpoints – stopping at a line of code during execution. • Stepping through lines of code one at a time. • Tracing through a program to output the values of variables.
Run Time Environment	• Output window. • Simulating different devices the program can run on.
Usability Functions	• Navigation, showing/hiding sections of code. • Formatting source code often in different colours. • Text-editor functions • Illustrating keyword syntax and auto-completing command entry.
Translator	Some IDEs have an inbuilt translator to test the program and make small alterations before compiling the final program into an executable file for distribution

Knowledge Organiser 3 : Data Storage

1. Data units

Bit (b)	The smallest unit of data. 0 or 1
Nibble (N)	4 bits
Byte (B)	8 bits (note the difference between b and B)
Kilobyte (KB)	1000 bytes. Note KB is different from Kb
Megabyte (MB)	1000 KB
Gigabyte (GB)	1000 MB
Terabyte (TB)	1000 GB
Petabyte (PB)	1000 TB

2. Conversions

Binary to Denary
Denary to Binary
Hexadecimal to Denary
Denary to Hexadecimal
Binary to Hexadecimal
Hexadecimal to Binary
Left Binary Shift
Right Binary Shift

3. Operations

Binary addition	You should arrange the two binary numbers above each other so that the columns line up. Start on the rightmost digit and add them. If there are any carries, write them down next to the next left column.
Overflow	If the answer to the left column results in a carry, this is known as an overflow and it causes an overflow error. This can cause problems if a computer program hasn't been written to handle overflows.
Left Binary Shift	Make the number longer, and therefore bigger. Each place it shifts will double the value. A binary left shift of one place (<<1) will double the value, a binary left shift of two places (<<2) with quadruple.
Right Binary Shift	Make the number shorter, and smaller. The right most digit is "lost", so we forget about it. A binary right shift of one place (written as >>1) halves the number, and a binary right shift of two places (>>2) will quarter it.

4. Characters

Individual Characters	Each character is assigned an individual binary code to represent it. The number of bits depends on the 'encoding' used
Character Set	The name given to a collection of characters matching to binary codes. There are many examples.
Choice of Character Set	A character set encoded with more bits allows more characters. This is useful for accents, symbols, emojis, other languages (e.g. Chinese)

5. Examples of Character Sets

ASCII	7-bits to represent characters allowing 127 characters to be represented
Unicode	16 / 24 / 32 bits. Covers many modern and historic languages, as well as lots of symbols which are used in maths and other specialist areas

6. Images

Pixel	The smallest element of a bitmap image. Pixels desk
Vector vs Bitmap	A vector image describes the lines and shapes. A bitmap image consists of rows of coloured dots.
Colour Depth	The number of bits used to represent each pixel in a bitmap image. An 8 bit image can show 2^8 or 256 colours.
Resolution	In a bitmap image resolution is measured in DPI (dots per inch). The higher the resolution the better the picture quality
Metadata	Data that is saved before and after the image to tell the computer how to decode the image. It includes the size in pixels (width x height), the colour depth, the resolution, the GPS location of where the image was taken, etc.
Image size	The size of an image is width x height x colour depth (+10% for metadata)
Factors	Greater colour depth and/or greater resolution will make the file size bigger, and improve the quality of the image; and vice versa

7. Sound

Analogue / Digital	Analogue sound waves must be converted into digital sound waves by taking a sample of the sound at set intervals. This is because computers can only work with digital 'numbers', and not analogue 'sound'
Sample rate	Number of times analogue signal is sampled per second. Measured in Hertz
Bit depth	Number of bits used per sample. Sometimes known as sample resolution
File size	Sample rate x sample resolution x seconds
Factors	Larger sample rate and/or bit depth will make the file size bigger and improve the playback quality; and vice versa. Also, making the duration of the recording longer will make the file size bigger, and vice versa

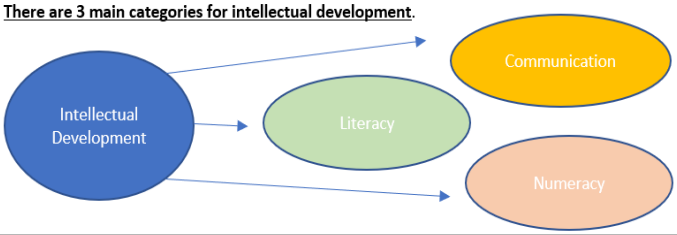
8. Compression

Compression	Compression is when a file is encoded so it uses fewer bits than the original file format
Lossless compression	Gets rid of unnecessary data to re-present data without losing any information. This process is reversible
Lossy compression	Gets rid of the least essential data. This is an irreversible process: once data is lost it can't be recovered

Topic Area 1: Physical, intellectual and social developmental norms

Intellectual Development – Growth of a child's ability to think

There are 3 main categories for intellectual development.



Numeracy Skills

This is linked to problem solving and reasoning
It's known as number skills.
These include:
Speaking and using numbers. E.g. there are 2 apples.
Counting, including mathematical number squares.
Recognising numbers e.g., 1,2,3 etc.
Using mathematical ideas e.g., size, shapes and mass etc.
Recognising and drawing shapes: e.g. triangles
Recognising and making patterns: e.g. odd and even numbers, sequencing.
Using the correct vocabulary, adding and taking away.
Simple calculations e.g. 2+2
Using appropriate language: e.g. Daisy has less apples now

Communication

Children use communication through observing and copying what they hear/see:
Body language – expressing feelings through the position of their body.
Listening - being able to hear and understand what is being said.
Verbal – building on the vocabulary that they hear.
Gestures – pointing to things that children want.
Sign language – children with hearing impairments may use sign language.
Reading and writing – using the written form to communicate.

Literacy Skills

Reading and writing are known as literacy skills. Developing a love of books with a child will help with this skill. This can be developed from an early age and can be encouraged through reading books to a child from birth.

Social Development – Building relationships and interacting with others

Keyword	Synonyms	Definition and sentence to contextualise
Acceptable Behaviour	Good behaviour	How they handle emotions and the development of manners and behaving in socially acceptable ways.
Self Esteem/ Independence	Confidence	This is when a child has a sense of self-worth or personal value.
Sharing	Giving to others	Sharing toys, objects and people. Also, things like waiting their turn. This takes time to master.
Self Confidence	Confidence	This is when a child has a feeling of belief and trust in their own ability.

3 Years – Shows concern and affection for others. Copies adults and friends. Takes turns in games. Separates easily from parents. Shows a wide range of feelings. Dresses and undresses self. Maybe toilet trained during the day.

4 Years – Plays cooperatively with other children. Prefers playing with other children rather than alone. Enjoys doing new things. Becomes more creative in make-believe play. Seeks new experiences. Expresses likes and dislikes.

5 Years – Wants to please friends. Wants to be like friends. Agrees to rules more easily. Likes to sing, dance and act. Knows who is a girl and a boy. Knows the difference between fantasy and reality.

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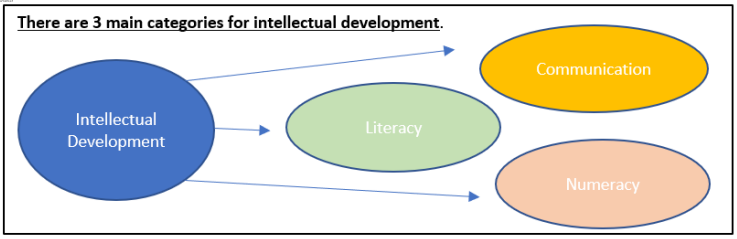

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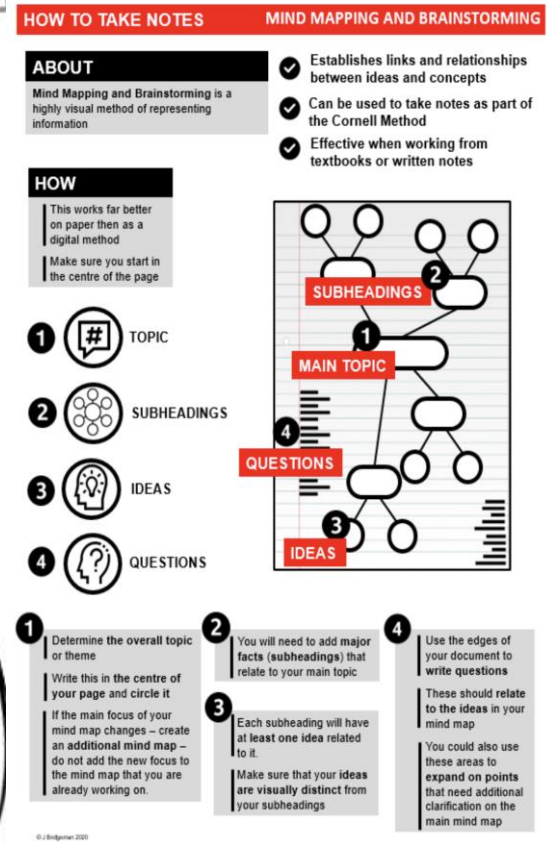
Key Word	Meaning
Family (of instruments)	Instruments or equipment which are 'related' to your instrument (e.g. in the same orchestral 'family' or 'section' or different sizes and types of your instrument).
Pitch	The highness or lowness of a sound, governed by the rate of vibrations producing it.
Pitch Range	The distance from the lowest to the highest note a musical instrument can play. For a singing voice, the equivalent is the "vocal range".
Playing Technique	The ability of instrumental and vocal musicians, or performers using technology to exert optimal control of their instruments of playing equipment in order to produce the precise musical effects they desire. Also includes playing a musical instrument or singing in a particular way *(e.g. pizzicato/arco/col legno for strings).*
Sound Production	Describes how sound is produced either on a musical instrument *e.g. via vibration*, a voice or electronically using digital technology.
Special Effects/FX	FX in music technology stands for "effects" which is the processing of sound using digital software *(e.g. reverb, delay, phaser etc.)* Musical instruments and the voice can also produce special effects by being played or performed in a particular way *(see Playing Technique above).*
Tessitura	A term used commonly in vocal music and singing to describe the pitch range in which most notes of the vocal part fall (comfortably for the singer/performer).
Timbre/Sonority	The character or quality of musical sound or voice. Each musical instrument has its own unique timbre which is how we identify it as distinct from others.
Transposing Instrument	An orchestral instrument for which parts are written in a different key from that in which they sound *e.g. the clarinet and many brass instruments.*

- ✓ A single BEAT is a basic unit of musical time. In dance music, beats are grouped together to make a repeating pattern – normally made up of either twos, threes or fours.

- ✓ The repeating pattern of beats gives us the METRE or the TIME of the music, shown by the TIME SIGNATURE at the start of a piece of music. Each repetition of the beat-pattern is called a BAR and bars are separated by vertical lines called BARLINES.
- ✓ A DOUBLE BARLINE always comes at the end of a piece of music or section of music. The TOP NUMBER of a time signature tells you how many beats there are in each bar.
- ✓ The BOTTOM NUMBER tells you what types or note values these beats are (as divisions of a semibreve = 1): 1 = Semibreve 2 = Minim 4 = Crotchet 8 = Quaver 16 = Semiquaver SIMPLE DUPLE METRE:
- ✓ Two beats to a bar Dance music such as MARCHES, the TANGO and IRISH REEL often use simple duple metre. SIMPLE TRIPLE METRE: Three beats to a bar Dance music such as WALTZES and the MINUET, COURANTE and SARABANDE from the Baroque Dance Suite often use simple triple metre.
- ✓ SIMPLE QUADRUPLE METRE: Four beats to a bar Dance music such as the TANGO, the IRISH REEL, the ALLEMANDE from The Baroque Dance Suite, AMERICAN LINE DANCE MUSIC (Country and Western), DISCO and CLUB DANCE often use simple quadruple metre.

MIND MAPS

Mind maps are a great way to revise key information. Have a read through the information on your ***OPTION SUBJECT*** and then use the information below to help you create mind maps.



Fancy some additional Class Charts points? Impress your teachers with any of these BHAmazing pieces of vocabulary, and they will award you extra CC points. Challenge: Can you use them in any sentences and show a member of the Senior Leadership Team?

Word List 1	Word List 2	Word List 3	Word List 4	Word List 5	Word List 6	Word List 7
Myriad (adjective) – many	**Caustic** (adjective) – mean / harsh	**Tension** (noun) – feeling of anxiety or nervousness	**Omniscient** (adjective) – all-knowing	**Sentimental** (adjective) – emotional	**Oppressed** (adjective) – subjected to cruel mistreatment	**Metamorphosis** (noun) – a change / transformation
Assert (verb) – state a fact confidently or forcefully	**Elucidate** (verb) – to make clear	**Oblivious** (adjective) – unaware	**Gullible** (adjective) – believes things easily	**Bawdy** (adjective) – rude or vulgar	**Subservient** (adjective) – obedient / submissive	**Abhorrent** (adjective) – repulsive
Egregious (adjective) - outstandingly bad	**Esoteric** (adjective) – likely to only be understood by a small number or people / obscure	**Naïve** (adjective) – Inexperienced / unaware	**Supercilious** (adjective) – arrogant	**Hypermasculine** (adjective) – overly masculine	**Exploit** (verb) – to use someone for your own good	**Abhor** (verb) – to hate
Erroneous (adjective)- wrong	**Tenuous** (adjective) – weak or fragile	**Pretentious** (adjective) – arrogant	**Tyrannical** (adjective) – a cruel dictator	**Atavistic** (adjective) – has characteristics of an earlier generation	**Epiphany** (noun) – a sudden realization	**Fate** (adjective) – destiny
Engender (verb) – to cause	**Perfunctory** (adjective) – carried out with minimal effort	**Pompous** (adjective) – arrogant	**Brazen** (adjective) – bold, shameless	**Troglodytic** (adjective) – like a caveman	**Façade** (noun) – a front (to 'wear a façade' means you wear a metaphorical mask, covering your true emotions or character)	**Integral** (adjective) – important
Employ (verb) – to make use of	**Moral** (noun) – a lesson	**Privileged** (adjective) – having an advantage over other, usually wealth	**Elusive** (adjective) – mysterious	**Apathetic** (adjective) – indifferent / lazy	**Microcosm** (noun) – a smaller community which represents a larger one	**Demise** (noun) – a person's downfall or death
Salient (adjective) – most noticeable and important	**Autonomy** (noun) – independence	**Compassionate** (adjective) – sympathetic	**Chauvinistic** (adjective) – has an attitude of superiority to opposite sex	**Segregated** (adjective) - separated	**Aloof** (adjective) – stand-offish	**Ridicule** (verb) – to make fun of
Advantageous (adjective) – providing an advantage / beneficial	**Assertive** (adjective) – confidence	**Vindictive** (adjective) – spiteful, cruel	**Materialistic** (adjective) – cares for objects and commodities	**Misogynistic** (adjective) – hateful towards women	**Degenerate** (adjective) – disgusting	**Deride** (verb) – to mock
Galvanize (verb) – to shock or excite someone into action	**Conceited** (adjective) – excessively proud / vain	**Duplicitous** (adjective) – having two sides	**Prophetic** (adjective) – able to accurately predict	**Choleric** (adjective) – quick-tempered, angry	**Depraved** (adjective) – immoral / evil	**Contempt** (noun) – hate
Substantiate (verb) – to provide evidence	**Superior** (adjective) – better than	**Narcissistic** (adjective) – self-obsessed	**Impulsive** (adjective) – rash / careless	**Secular** (adjective) – not religious	Feral (adjective) – wild	**Hysterical** (adjective) – uncontrolled emotion

My BHAmazing vocabulary, written in sentences:

1.

2.

3.

4.

5.

6.

7.