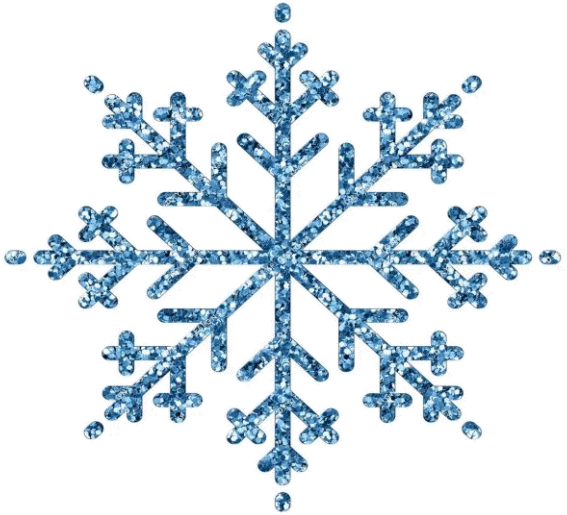
YEAR 11



BHA's Knowledge Quest

Autumn 2
(Nov - Dec)
2026-2027



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 Seneca 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.

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										

Enrichment and Intervention 2026-27 Term One

Autumn Term

	Monday	Tuesday	Wednesday	Thursday	Friday
Breakfast 7.45am – 8.30am	Start Right Club Library open	Start Right Club Library open Computer room access JSI Room 31 8am- 8.30am	Start Right Club Library open Computer room access JSI Room 31 8am- 8.30am	Start Right Club Library open Computer room access JSI Room 31 8am- 8.30am	Start Right Club Library open Computer room access JSI Room 31 8am- 8.30am
Lunch 12.45pm – 1.15pm	Yr 9 MUGA Yr 11 Library Yr 11 Rock Band- SWE- Room 36 Yr 7 Table Tennis Yr 7-10 Art Club EF Room 26	Yr 11 MUGA Yr 10 Library Yr 8 Table Tennis Yr 8 – Cyber Girls Competition - room 62 – JMole (Start OCT)	Yr 10 MUGA Yr 9 Library Y7-10 Singing Stars- SWE- Room 36 Yr 9 Table Tennis Yr 8 – Cyber Girls Competition - room 62 – JMole (Start OCT)	Yr 8 MUGA Yr 8 Library Yr 10 Table Tennis Yr 8 – Cyber Girls Competition - room 62 – JMole (Start OCT)	Yr 7 MUGA Yr 7 Library Yr10/11 Music Coursework catch- up SWE- Room 36 Yr 11 Table Tennis
Period 7 Monday Tuesday Thursday 3.30pm – 4.30pm	Year 11 Geography /History Intervention Yr 7 –10 Sparx Maths Club – EMU / RMI Room 10 Yr 7–10 Cooking Club MS/CC Room 45	Year 11 English and Math Intervention Yr 7 – 10 Contemporary Dance Club CG Dance Studio Yr 7 – 10 Digital Skills MCA Room 43 Yr 7–10 Crochet Club JWE Room 53	Year 11 Open / MFL Subject Intervention Week 1: **C Block** Week 2: **B Block** Yr 7–10 Chess Club XIS Rm 12 Yr7-10 Latin Club for Beginners AA Room 58 Yr 7–10 Crochet Club JWE Room 53/54	Year 11 Science Intervention Yr 7-10 Rep Theatre – Performing Arts Club Room 38 Yr 10 Rock Band SWE- Room 36 Yr7-10 Learn Russian RM Room 57	Y7-Y11 SEND Master Builder LOM Lower School Hall Y7-Y11 SEND BHA Mic Drop BKA/NBI Room 3 Y7-Y11 Dungeons and Dragons PCR Room 5
Wednesday Friday 2.35pm – 3.35pm	Term 1 full but sign up for term 2 available Yr 7 Football LSM/EBR Field Yr 7-10 Trampolining GHO Small Gym Yr 7 – 10 Table tennis ADA Large Gym Yr 7 – 10 Science Experimental Club JTA / SEL Room 48 Yr 7 – 10 Sparx Reader Club LOM/ADi Room 31 Yr 7- 10 Karaoke Club JRO Dance Studio	Yr 7 – 10 Beyond the Books- Reading Club FHU Room 24 Yr 7 – 10 Fantastic Films and Brilliant Books- Writing Reviews FBA- Room 23 Yr 8 Football WTH Field Yr 7-10 Netball GHO Large Gym Yr7-10 Basketball JSM MUGA Yr 7-10 Board Game Club KGO Room 38 SEND Cooking Club MS / CCR Room 45 Y10iMedia Skills Lab HA Room 10	Yr 7-10 Studio G- Tech Club SWS Room 43 Yr 7 – 10 The Forum- Debate and Ideas Society BED Room 38 Yr 7 – 10 The story Forge Creative Writing Club SBS Room 24 Yr 7 – 10 Uno Club QSM Room 23 Yr10 Science Intervention ASI Room 40 Yr 9/10 Football JSM/WTH Field Yr 7 – 10 Netball ADA MUGA Yr 7 – 10 Make a War Film Club DL Room 22 Yr 7 – 10 Homework Club KJO/JRE Room 15 with laptops Yr 7 – 10 Boards of Fame- Board game club MSH/NBI Room 55 Yr 7 – 10 WBA Multi Skills SJO Back Playground	Yr7-10 Latin Club Legacy Cohort AA Room 60 Yr10 Geography Intervention SHO Room 1 Yr 7–10 Girls Football ADA Field Yr 7–10 Trampolining GHO Small Gym Yr 7–10 Basketball JSM MUGA Yr 7–10 Table tennis WTH Large Gym Y7-10 Task Master, GEG Room 28 Y7–10 Boccia Ballers HCL/NBI Dance Studio SEND Art Attack CC/MS Room 3 Y10 Additional Reading Comprehension (Invite Only) Room 53, LOM/ADi	Y7-Y11 Friday Film Club Room 16 RBE
			Y10 Additional Literacy JPG Room 52 Y10 Computer Science - JMole – Room 62/10 (Invite Only) KS3/4 – Pilot School – Room 62 – J Mole/H Anderson (Limited Spaces) To launch later		

Academic	**Creative**	**Physical**
☐ All Intervention Classes or Coursework catch up ☐ Beyond the books reading club ☐ Chess Club ☐ Fantastic Films and Brilliant Books Review ☐ The Forum Debate and Ideas Society ☐ Homework Club ☐ Latin Club (Beginners and Legacy) ☐ Learn Russian Club ☐ Science Experimental Club ☐ Sparx Maths ☐ Cyber Girls Computing ☐ Task Master	☐ Digital Skills ☐ REP Theatre - Performing Arts ☐ Rock Band ☐ Studio G Tech Club ☐ Singing Stars Lunch Club ☐ Art Lunch Club ☐ Crochet Club Tue/Wed ☐ Cooking Club ☐ Make a War Film Club ☐ Dungeons and Dragons ☐ The Story Forge Creative Writing Club ☐ Friday Film Club ☐ Mic Drop ☐ Art Attack ☐ Masterbuilder The Big Build- Lego Club ☐ Boards of Fame – Board Game club ☐ Uno Club ☐ Task Master	☐ Contemporary Dance ☐ Football ☐ Trampolining ☐ Table Tennis ☐ Basketball ☐ Netball ☐ Boccia Ballers ☐ WBA MultiSkills ☐ Task Master

Dates to remember this half term:

November

December

Attendance record



Week	Attendance %
Week 1	
Week 2	
Week 3	
Week 4	
Week 5	
Week 6	
Week 7	

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:
Week 1		
Week 2		
Week 3		
Week 4		
Week 5		
Week 6		
Week 7		
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:	Science Assignments:	History Assignments:	Geography Assignments:
Week 1				
Week 2				
Week 3				
Week 4				
Week 5				
Week 6				
Week 7				
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	
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

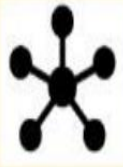
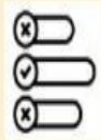
Use this page to record any homework this half term

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

Homework Log

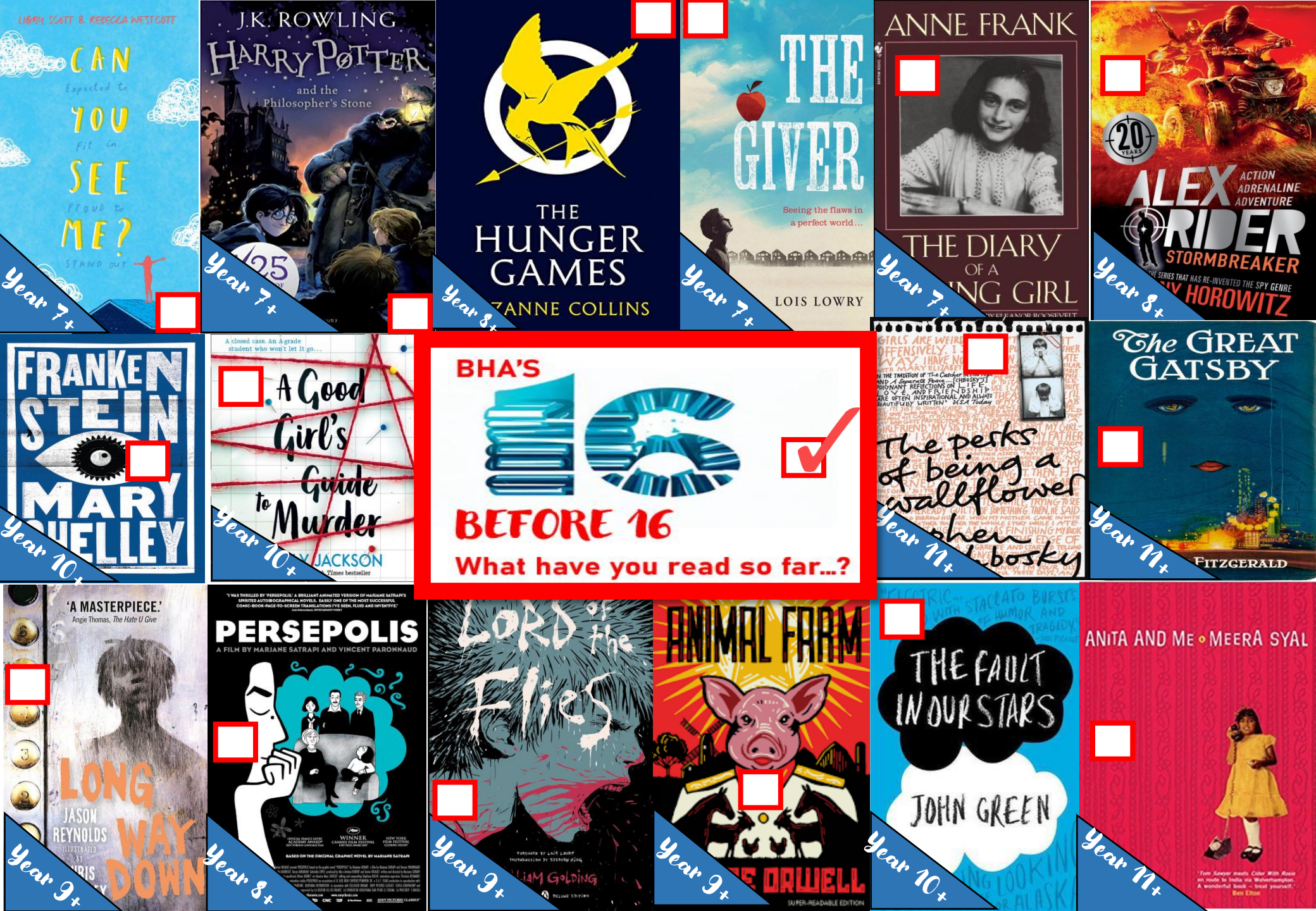
Use this page to record any homework this half term

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. 



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Year 7+
Year 7+
Year 8+
Year 7+
Year 7+
Year 8+
Year 10+
Year 10+
BHA'S
BEFORE 16
What have you read so far...?
Year 11+
Year 11+
Year 9+
Year 8+
Year 9+
Year 9+
Year 10+
Year 11+

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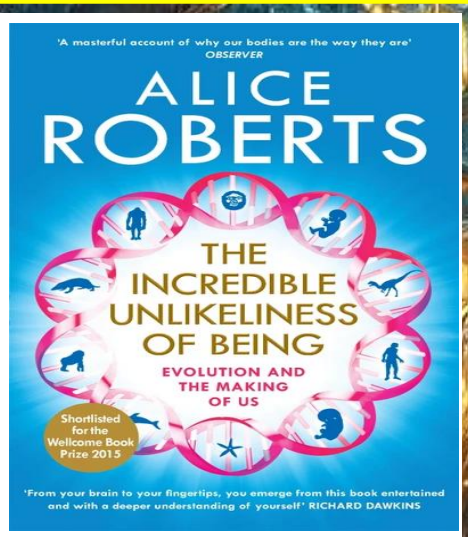
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YEAR 11

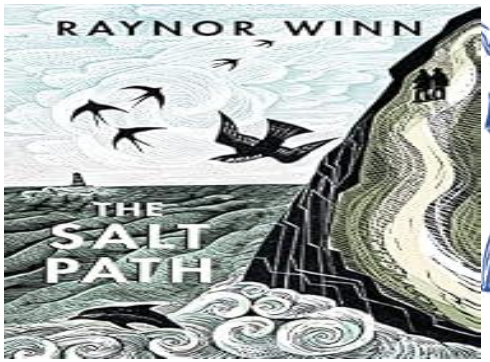
Recommended Reading



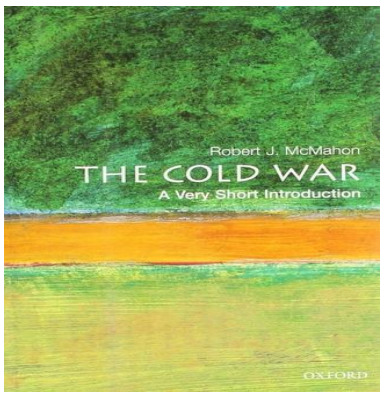
J. B. Priestley travels around England and writes about the lives of ordinary people. He explores the differences between rich and poor communities and encourages readers to think about how society could be fairer.



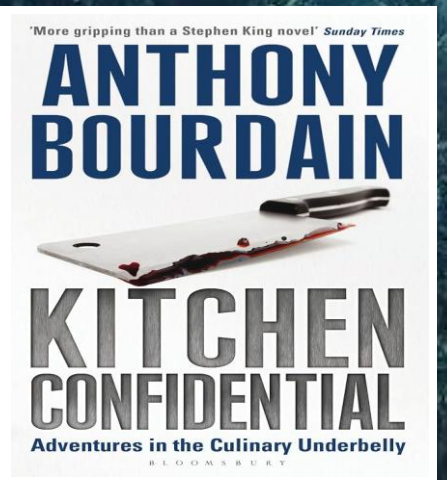
The book explores how humans develop from a single cell into complex individuals. Combining evolution, genetics and anatomy. Roberts explains how our bodies reveal clues about our ancient ancestors and the remarkable journey of human development.



The book takes readers on a global journey, highlighting famous rivers such as the Amazon, Nile and Mississippi, as well as lesser-known waterways. It explains how rivers shape landscapes, support ecosystems and influence human life, culture and history. Each river is brought to life with fascinating facts about wildlife, geography and the challenges these waterways face.



The book explains the causes, key events and consequences of the Cold War between the United States and the Soviet Union. It explores how this global rivalry shaped politics, conflicts and international relations from the end of the Second World War until the collapse of the Soviet Union.



A memoir that takes readers behind the scenes of the restaurant industry. With honesty and humour, Bourdain shares his experiences as a chef, revealing the challenges, chaos and passion of life in professional kitchens.

Challenge yourself by reading these topic-related books for this half term!

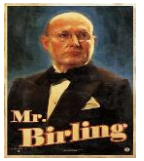


Act summary

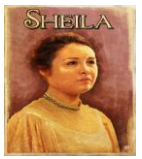
Act 1	The Birling family are celebrating the engagement of Sheila Birling to Gerald Croft. Inspector Goole arrives and tells them a young woman has committed suicide. The audience learns that Arthur Birling (the patriarch of the family) sacked the young woman (Eva Smith) but he is unremorseful. Sheila then got Eva sacked from her next job at a clothes shop due to being jealous. We then learn that Eva changed her name to Daisy Renton. Gerald is startled when he hears this name.
Act 2	We discover that Daisy was Gerald's mistress for some time but Gerald broke things off and turned her out. Sheila hands Gerald back the engagement ring. The Inspector questions Mrs Birling and Sheila forcefully encourages her mother to be honest and open. Eva/Daisy turns to the charity Sybil runs when she needs support for her unborn child. Mrs Birling shows no remorse, instead she says the girl tried to use the Birling name. She condemns the father of the child. Erica enters at this point.
Act 3	Eric confesses to having sex with Eva/Daisy when he was drunk. He reveals how he stole money from his father's company to support Eva and her unborn baby. The Inspector reminds the Birling family of their social responsibility and then leaves. Gerald returns and tells the family that the Inspector is a 'hoax.' The older generation and Gerald rejoice. Sheila and Eric are shocked that the others haven't learnt anything. A phone call at the end reveals a woman has committed suicide and an inspector will be visiting soon…

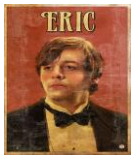
Themes – A theme is an idea or message that runs throughout a text.

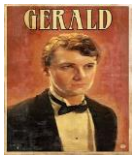
Responsibility	All the family are forced to reflect upon their behavior towards Eva Smith/Daisy Renton and consider how responsible they are for her death. Some characters accept **responsibility** and feel **guilt**. On the other hand, some are unwilling to accept any. *'We are members of one body. We are responsible for each other.' The Inspector's final speech.*
Social Class	Class **defines** each character in the play. There is a clear **hierarchy** in the class system that causes **oppression** of the lower class. The actions of the upper class directly **impact** on those below. *'If you don't come down sharply on some of these people, they'd soon be asking for the earth.' Mr. Birling.*
Gender	Throughout the play there is evidence that a woman is to be seen and not heard. The males hold a lot of **power** at the start. Eric's and Gerald's treatment of Eva/Daisy as an **object**. Young women challenge this (Sheila) and by the end **stereotypes** are beginning to be broken. *'...not only something to make 'me look prettier - but - well, a sort of sign or token of their self-respect.' Mr. Birling discussing women.*
Conflict among generations	Priestley uses age to show the **different attitudes** in society at the time. The older characters represent **outdated** ways of thinking; Sybil and Arthur believe in only looking after themselves. The younger characters represent a move towards caring about others in society. *'You're beginning to pretend now that nothing's really happened at all.' – Eric speaking to his parents.*















Context

J.B Priestley: The writer of the play and a social commentator who has a **social conscience**. A popular figure and keen supporter of social reform. He fought in World War I and saw the effects it had on the working class. During the 1930s he became an activist, campaigning about the effects of social inequality in Britain.

Pre and Post-War: Before WW1, there was an air of complacency that a war would actually break out, despite there being numerous strong hints. There were strong distinctions between upper/lower classes and women were subservient to men. After the WW2, the class distinction had been greatly reduced. Women had formed a more valuable and respected place in society. There was a greater desire for social reform.

Capitalism: Capitalism is where businesses aim to make money and a country's trade is owned by private companies/people. It is generally considered the opposite of socialism. Priestley deliberately criticizes the **selfishness** of this system and wants a fairer society. **Birling personifies this.**

Socialism: Socialism is an approach to economic and social systems that is characterized by social ownership, democratic control, and high levels of **equality.** They're generally concerned with ensuring that **inequalities between wealth and class are erased**. In the play, the **Inspector harbors socialist views.**

Social and Moral Responsibility: Attitudes towards social and moral responsibility changed rapidly in the time between when the play was set (1912) and the time when it was first performed (1946). In 1912, the general attitude of those with social and economic sway was towards looking after oneself and one's family. By the mid-1940s, however, Clement Attlee's Labour party won a landslide election, reflecting a wave of enthusiasm towards communal responsibility for everyone in society.

Titanic: RMS Titanic the largest British passenger ship at the time. It was a symbol of **progression** within society. It sunk in 1912 after striking an iceberg. It was one of the deadliest maritime disasters of the modern period and sent shockwaves around the world. It was supposed to be the pinnacle of comfort and safety and was frequently labelled **'unsinkable'.** However, during the disaster it was discovered that there wasn't enough lifeboats and the lower-class passengers were last to be given the chance of escape. Consequently more of these passengers died. It is worth remembering that Arthur holds the arrogant views of that many others did of the Titanic before it met its demise.

Genre and Conventions

Well-made play: This is a popular type of play from the 19th Century where all the events **build up to a climax**. It is primarily concerned with events that happened before the play. The plot is normally **intricate** and **complex**.

Morality play: This would be a play that **taught** the audience lessons that linked to the **seven deadly sins** where characters that committed these sins are **punished**.

English

Assessment Objectives

AO1: Response to question and use of quotations;

AO2: *Analysis of writer's methods using terminology and the exploration of the effects on reader;*

AO3: *Context and links to genre/themes;*

AO4: *Vocabulary and SPAG.*

Main Characters – Consider why Priestley included these characters. What is their purpose in the play? What might they personify?

Arthur Birling is the **patriarch** of the Birling family. His success in his business means his family live in the upper-middle class. He believes in **capitalistic** principles and rejects socialist beliefs. He considers Sheila's engagement **good for business.**
'And I'm talking as a hard-headed, practical man of business. And I say there isn't a chance of war.'

Sybil Birling is often described as being a **'cold'** character and is her husband's **'social superior.'** She is more concerned in ensuring her family does not '**lose face**.' She also serves in a charity committee that's aims are to assist women who need help.
'She was claiming elaborate fine feelings and scruples that were simply absurd in a girl in her position.'

Sheila Birling is the first character to **accept responsibility** and show **remorse**. She is **childish** at the start of the play but grows in **maturity.** Sheila takes on the role of the **inspector**, holding her family to account, once he departs.
'That's what I meant when I talked about building up a wall that's sure to be knocked flat.'

Eric Birling: Eric works for his father and has a drinking problem as he spends his time getting **'squiffy.'** He is **'half shy-half assertive.'** Only once all of his issues have been revealed are his family force to address his issues. He stands by his sister, Sheila, at the end.
'I don't know - really. Suddenly I felt I just had to laugh.'

Gerald Croft is the fiancé of Sheila and comes from a prosperous, well-know family. The Inspector criticizes Gerald's affair with Daisy but suggests Gerald is the least culpable for her death. Gerald goes out of his way to save his skin at the end suggesting his **capitalistic views** are entrenched and **will not learn** from his mistakes.
'The girl saw me looking at her and then gave me a glance that was nothing less than a cry for help.'

Inspector Goole is an **omniscient** character that seems to know all the answers before interviewing each character. He is in **command** of the situation despite others trying to put him off. He acts a **Priestley's mouthpiece.**
'He creates at once an impression of massiveness, solidity and purposefulness.'

Eva Smith/Daisy Renton is a young, working class woman, who is very important to the play, yet we never meet her. Her gruesome death is used to exploit the harsh treatment of the lower classes.

Edna is the Birling's maid and the only working-class character we see on stage.

Critical Verbs

Priestley wrote because he was influenced by what was going on in the world he was living in. Society, religion, politics, family and personal experiences and beliefs will all have impacted on **what** Priestley 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
Priestley	uses	Arthur Birling the Birling's home the death of Eva Smith	to advocate to criticise to celebrate to warn to teach to expose to personify	the need for more social responsibility in a post-war society.

Symbols and Killer Quotations



'As if we were all mixed up together like bees in a hive - community and all that nonsense.'
- Simile exploring the Edwardian social structure.
- Bees produce honey. Is Priestley saying the product of socialism is 'sweet'?



'Unsinkable, absolutely unsinkable.'
- Like Mr. Birling's narrow-minded views? He won't be swayed and his views are 'unsinkable.'
- Microcosm of society on board.
- Society is doomed to 'sink' if people don't change.
- Dramatic irony.



'She'd swallowed a lot of strong disinfectant. Burnt her inside out, of course.'
- Disinfectant is used to clean and eradicate germs.
- Eva/Daisy being seen as something needed to be 'cleaned' from society. Is this how she sees herself by the end of her encounters?
- Link to the 'fire' mentioned in the Inspector's final speech?



The unborn child.
- Would 'merge' two classes together.
- He would be a Birling and the 'future' of the family. What does it say about their future?
- Impact on the innocent in society. Doomed from the start?



'Fire, blood and anguish.'
- Divine retribution.
- Foretelling the war. Does the Inspector know that the audience has not changed?
- Hell? Punishment for sins.

Threshold Concepts



Time Theories.
Dunne believed we could begin to see forward in time through our dreams. We could look at our present actions and see the consequences of them. These would allow us to change.
Ouspensky believed that when we die we re-enter our life once more from the beginning. We are born again to the same parents and continue to repeat all the events of our life as before. We can escape repetition by improving ourselves and leading better lives.



Seven Deadly sins and virtues
Each character represents one of the sins (pride, lust, gluttony, sloth, avarice, wrath, envy). Eva/Daisy shows more virtues than the Birlings do.



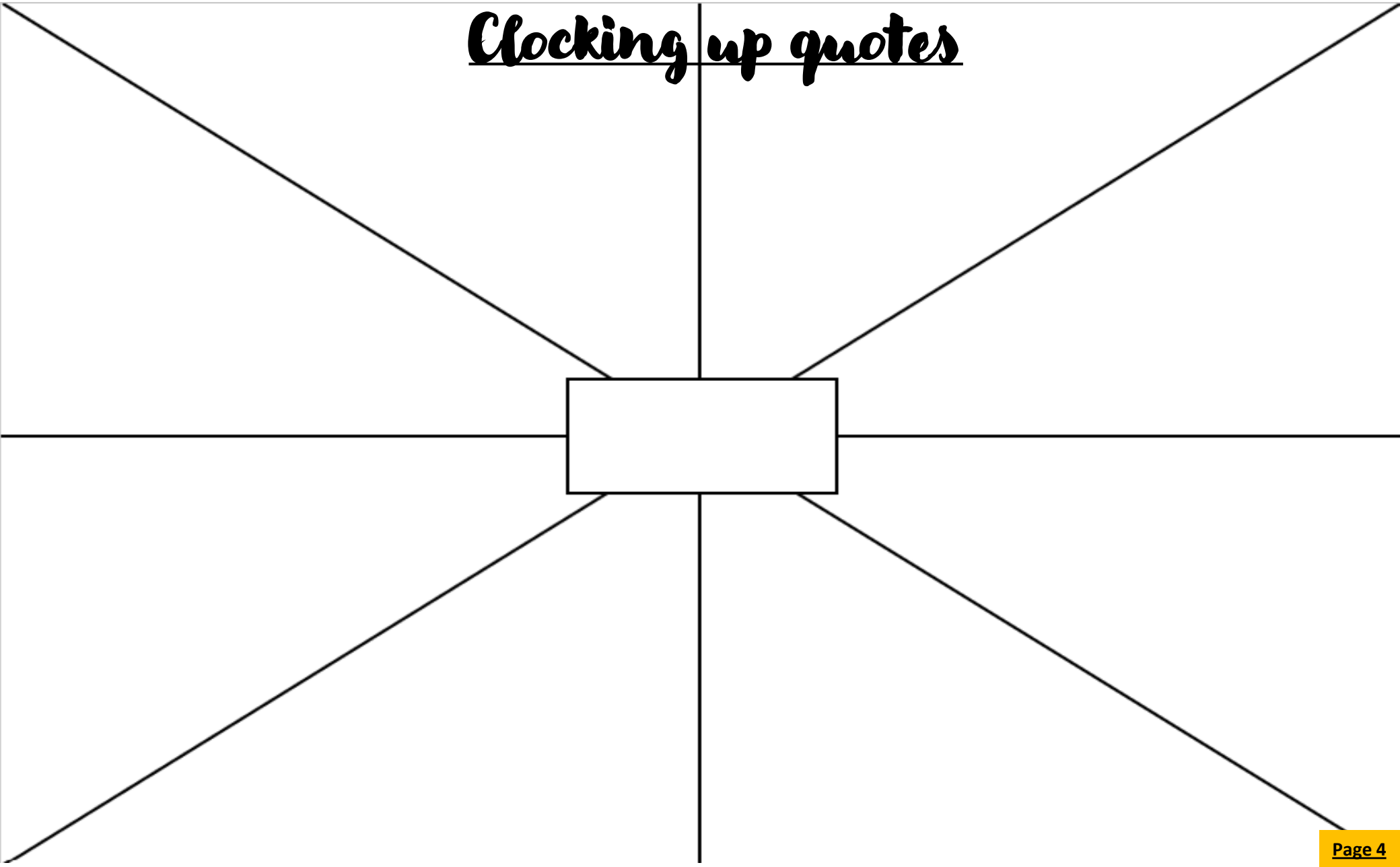
Representation of women
Suffragettes (violent and aggressive) and suffragists (peaceful) were political groups focused on achieving power for women and the right to vote.
Consent to sex is something Eva/Daisy doesn't seem to give during her encounter with Eric. Priestley doesn't not class this as a sin for Eric. Raises questions about **misogyny** in society.



Social conditioning
Social conditioning is the sociological process of training individuals in a society to respond in a manner generally approved by the society in general and peer groups within society. The social context that Mr and Mrs Birling grew up in, is not that different to that of their children Eric and Sheila, yet JB Priestly had the latter two reform by the end of the play.

English. Choose what text you would like to revise and write that in the middle (e.g. Macbeth, An Inspector Calls, A Christmas Carol). Each section on the clock can either be a theme or character focus (e.g. Supernatural/ Banquo, Responsibility/ Eric). Once you have decided on the focus, make notes including key quotes and contextual links that you could use in an exam about that question

Clocking up quotes



Maths

FRACTIONS 1

What do I need to be able to do?

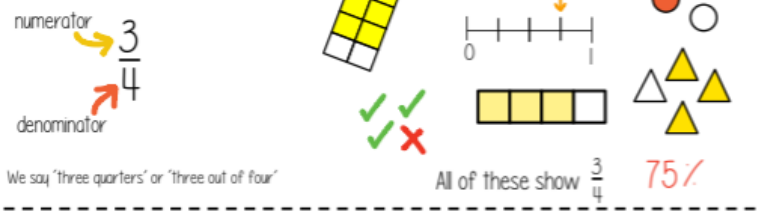
You should be able to:

- Understand different representations of fractions
- Fully simplify fractions
- Recognise and find equivalent fractions
- Convert between mixed numbers and improper fractions
- Add/subtract any fractions
- Add/subtract mixed numbers

Key Words

- Numerator: the top number of a fraction
- Denominator: the bottom number of a fraction
- Equivalent: of equal value
- Mixed Number: a number with an integer and a proper fraction
- Improper Fraction: a fraction where the numerator is larger than the denominator
- Coprime: two numbers which share no common factors (except 1)

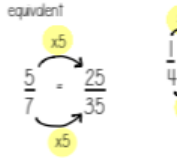
Representing Fractions



Equivalent Fractions

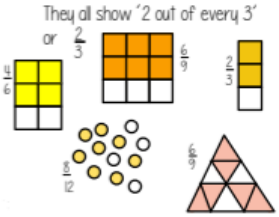
Two fractions are equivalent if they represent the same quantity

If the numerator and denominator have the same multiplier, they are equivalent

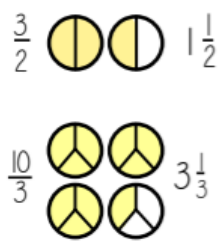


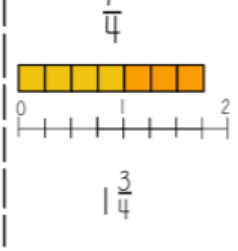
Each of these diagrams represents an equivalent amount.

They all show '2 out of every 3'



Mixed Numbers and Improper Fractions





Fractions can represent more than one whole.

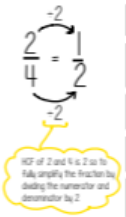
The denominator tells us how many parts make up one whole

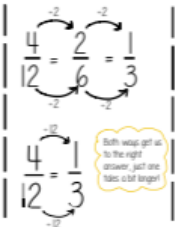
9/5 — This tells us that one whole is made up of 5 parts. We have 9 parts, so we can make one whole plus 4 parts.

1 4/5

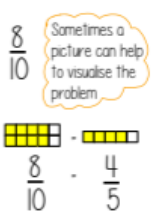
Simplifying Fractions

You must always simplify you fractions if you can





Sometimes a picture can help to visualise the problem



Once you cannot find a common factor, the fraction is fully simplified

7/10

This fraction is fully simplified as 7 and 10 have no common factors. We can say that 7 and 10 are COPRIME

Adding/Subtracting Fractions — Common denominators

Page 5

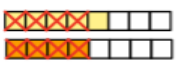
2/7 + 4/7



2/7 + 4/7 = 6/7

Remember that the denominator doesn't change

5/8 - 4/8



5/8 - 4/8 = 1/8

We can just subtract 4 from 5!

1/10 + 3/10

1/10 + 3/10 = 4/10 ÷2

4 and 10 have a common factor (2)!

= 2/5

You must always fully simplify you fractions

Adding/Subtracting Fractions — Common multiples

3/5 + 1/10

10 is a multiple of 5 (5 x 2) so, using equivalent fractions we can say: 3/5 = 6/10

6/10 + 1/10 = 7/10

3/4 - 1/12

12 is a multiple of 4 (4 x 3) so, using equivalent fractions we can say: 3/4 = 9/12

9/12 - 1/12 = 8/12 = 2/3

Remember you must always fully simplify your fractions!

1/2 + 2/3 + 1/6

Here, we know that 2 and 3 share a common multiple of 6, so we can say 1/2 = 3/6 and 2/3 = 4/6

3/6 + 4/6 + 1/6 = 8/6

Simplify

= 4/3

We need to give our answer as a mixed number

= 1 1/3

Adding/Subtracting Fractions — Different denominators

1/5 + 3/4

We need to find a common denominator using equivalent fractions

1/5 (x4) = 4/20

3/4 (x5) = 15/20



19/20

3/11 + 2/3 = 9/33 + 22/33 = 31/33

the LCM of 3 and 11 is 33, so our equivalent fractions are: 3/11 = 9/33, 2/3 = 22/33

5/7 + 4/9 = 45/63 + 28/63 = 73/63

Remember you can find the LCM of 7 and 9 by listing their multiples:
7, 14, 21, 28, 35, 42, 49, 56, 63, 70
9, 18, 27, 36, 45, 54, 63, 72,

= 1 10/63

Let's convert it to a mixed number

Adding/Subtracting Mixed Numbers

Method 1

1 3/4 + 2 1/2



We have three 'wholes'. 3/4 + 1/2

3/4 - 1/2 = 3/4 - 2/4

- 5/4

- 1 1/4

So we have:

3 + 1 1/4 = 4 1/4

Method 2

1 3/4 + 2 1/2

1 3/4 = 4/4 + 3/4 = 7/4

2 1/2 = 4/4 + 4/4 + 2/4 = 10/4 (x2, x2)

7/4 + 10/4 = 17/4 = 4 1/4

How many times does 4 go into 17? 4, 8, 12, 16, 20 — 4 with a remainder of 1

FRACTIONS 2

What do I need to be able to do?

You should be able to:

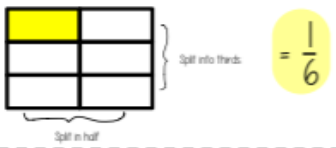
- Multiply unit fractions
- Multiply non-unit fractions
- Use cross-cancelling to simplify fractions before multiplying
- Divide integers by fractions
- Divide fractions by fractions
- Find fractions of amounts
- Use a given fraction to find the whole
- Find the reciprocal of an integer/fraction

Key Words

- Numerator: the top number of a fraction
- Denominator: the bottom number of a fraction
- Unit fraction: a fraction with a numerator of one
- Commutative: changing the order of the operations doesn't change the result
- Reciprocal: the reciprocal of a number is 1 divided by the number
- Coprime: two numbers which share no common factors (except 1)

Multiplying unit fractions

$\frac{1}{2} \times \frac{1}{3}$ "One half of one fraction"



$= \frac{1}{6}$

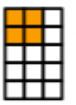
Multiplying any fractions

See cross-cancelling for a quicker method!

Example 1

$\frac{2}{3} \times \frac{2}{5} = \frac{4}{15}$

"Two thirds of two fifths"



Another way to think of it: Two parts out of three parts on two out of five rows

Example 2

$\frac{5}{7} \times \frac{14}{15} = \frac{5 \times 14}{7 \times 15} = \frac{70}{105}$

Remember to simplify as where possible!

$= \frac{2}{3}$

Example 3 $1\frac{1}{2} \times 2\frac{1}{3}$

$\frac{3}{2} \times \frac{7}{3} = \frac{21}{6} = \frac{7}{2}$

$= 3\frac{1}{2}$

Cross Cancelling Method

$\frac{2}{3} \times \frac{6}{7} = \frac{4}{7}$

(1 and 3 both have a common factor of 3, so we can divide both by 3)

This method means that we do not need to simplify our answer as it should be fully simplified already!

Example 1

$\frac{5}{9} \times \frac{18}{25}$

this becomes

$\frac{1}{1} \times \frac{2}{5} = \frac{2}{5}$

Remember, Multiply the numerators then multiply the denominators

Example 2

$\frac{15}{27} \times \frac{36}{45}$

this becomes

$\frac{1 \times 4}{3 \times 3} = \frac{4}{9}$

Dividing integers by a unit fraction

$3 \div \frac{1}{3}$ Think of this as 'how any times does a third go into 3?'



there are three thirds in one whole, so there are 9 thirds in 3 wholes

Reciprocals

A number multiplied by its reciprocal is always 1

$2 \times \frac{1}{2} = 1$

$5 \times \frac{1}{5} = 1$

The reciprocal of a is $\frac{1}{a}$

Dividing by a fraction, $\frac{1}{a}$, is the same as multiplying by its' reciprocal, a

Example

$3 \div \frac{1}{3} = 9$

$3 \times 3 = 9$

Dividing Fractions

Example 1

$\frac{2}{3} \div \frac{5}{7}$

$\frac{2}{3} \times \frac{7}{5}$

$\frac{2 \times 7}{3 \times 5}$

$\frac{14}{15}$

Example 2

$\frac{5}{12} \div \frac{25}{18}$

$\frac{5}{12} \times \frac{18}{25}$

$\frac{1 \times 3}{2 \times 5}$

$\frac{3}{10}$

Finding Fractions of Amounts

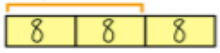
Find $\frac{1}{2}$ of 10 "Share 10 into 2 equal parts"



Find $\frac{2}{3}$ of 24

$\frac{1}{3}$ is 8 as 24÷3=8

2 parts is 16

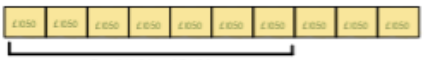


Each part must be worth 8

$\frac{2}{3}$ of 24 = 16

Find $\frac{7}{10}$ of £105

£105 ÷ 10 = £10.50

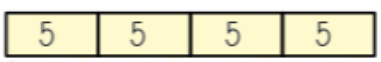


7 x £10.50 = £73.50

$\frac{7}{10}$ of £105 = £73.50

Reverse Fractions of Amounts

$\frac{3}{4}$ of a number is 15. What is the number?

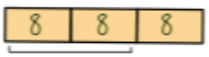


15

If 3 parts = 15, then one part must = 5

The original number was 20

$\frac{2}{3}$ of a number is 16. What is $\frac{3}{4}$ of the number?

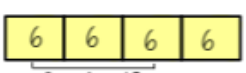


16

If 2 parts = 16, then one part must = 8

The number is 8 x3 = 24. So what is $\frac{3}{4}$ of 24?

One quarter is 6



3 x 6 = 18

= 18

Worded problem

A TV is on sale for 2/5 off the price. It now costs £150. How much did it cost originally?



£150

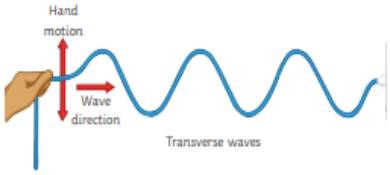
So the original price of the TV was 5 x £50 = £250

Science

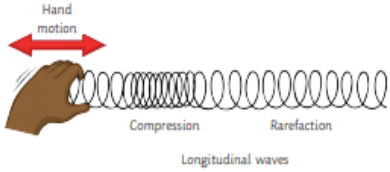
Transverse and Longitudinal Waves

Waves can be either **transverse** or **longitudinal**.

In a transverse wave, the vibrations are at a right angle (**perpendicular**) to the direction of the energy transfer. The wave has **peaks** (or crests) and **troughs**. Examples include **water waves** and **light waves**.

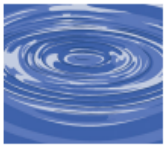


In a longitudinal wave, the vibrations are in the same direction (**parallel**) as the energy transfer. The wave has areas of **compression** and **rarefaction**. Examples of this type of wave are **sound waves**.

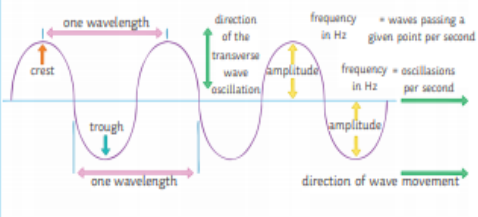


When a wave travels, energy is transferred but the matter itself does not move. Particles of water or air vibrate and transfer energy but do not move with the wave.

This can be shown by placing a cork in a tank of water and generating ripples across the surface. The cork will bob up and down on the **oscillations** of the wave but will not travel across the tank.



Properties of Waves



The **frequency** of a wave is the number of waves which pass a given point every second.

time period (s) = 1 ÷ frequency (Hz)

$t = 1 \div f$

The **wave speed** is how quickly the energy is transferred through a medium (how quickly the wave travels).

wave speed (m/s) = frequency (Hz) × wavelength (m)

$v = f \times \lambda$

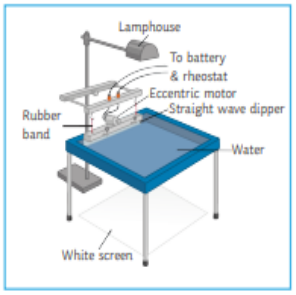
The speed of **sound waves** travelling through air can be measured by a simple method. One person stands a measured distance from a large flat wall, e.g. 100m. The person then claps and another person measures the time taken to hear the echo. The speed of the sound can then be calculated using the equation

speed = distance × time.

Remember the distance will be double because the wave has travelled to the wall and back again. It is important to take several measurements and calculate the average to reduce the likelihood of human error.

Required Practical Investigation 8

Aim: make observations and identify the suitability of apparatus to measure the frequency, wavelength and speed of waves in a ripple tank and waves in a solid, and take appropriate measurements.



The **ripple tank apparatus** shown is the most commonly used for this investigation. It is likely you will work in groups or observe the investigation as a demonstration by your teacher.

Method (assuming the apparatus is already set-up):

Turn on the power and observe the waves. Make any necessary adjustments to the equipment so that the waves are clear to observe (alter the voltage supplying the motor). **N.B. The lowest frequency setting on the motor will ensure that the waves measurements can be made more easily.**

To measure the **wavelength**, use the metre ruler and make an estimate quickly. You may want to use a **stroboscope** and freeze the wave patterns to make measurements.

Record 10 wavelengths and calculate the **average** value.

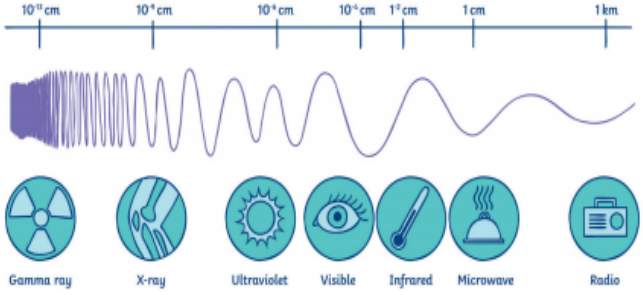
To measure the wave **frequency**, mark a given point onto the white paper and **count** the number of waves which pass the point within **10 seconds**. Divide your answer by 10 to find the number of **waves per second**.

Record 10 frequencies and calculate the **average** value.

To calculate the wave speed, use this formula:
speed = frequency × wavelength

The Electromagnetic Spectrum

Electromagnetic waves transfer energy from a source to an **absorber** as **transverse** waves. The different waves are grouped depending on their **frequency** and form a continuous spectrum known as the **electromagnetic spectrum**. Each of the frequencies of waves travel at the same **velocity** and can pass through a **vacuum** as well as **air**.



Frequency	Wave	Use	Other Information
Low ↓ High	radio waves	Communication via television and radio, and satellite communications.	Easily transmitted through air and can be reflected to change their direction. Harmless if absorbed by the human body. Are reflected back off the atmosphere and cannot pass through into space.
	microwaves	Communications including satellite communications and cooking food.	When the molecules absorb microwaves, their internal energy increases. This can be harmful when internal body cells become heated by over exposure to microwaves. Can pass through the atmosphere and into space.
	infrared	Short-range communications (remote controls), electrical heaters, cooking food, optical fibres, security systems and thermal imaging cameras.	It can cause burns to skin.
	visible light	Used for lighting, photography and fibre optics.	Frequency range that is detectable by the human eye.
	ultraviolet	Sterilising water and killing bacteria. Detecting forged bank notes.	Causes skin tanning and can lead to burns or skin cancer.
	X-rays	Medical imaging and airport security scanners.	Very little energy is absorbed by body tissues. Instead, it is transmitted through the body. These waves can lead to gene mutation and cancer.
	gamma rays	Sterilising medical equipment or food and treatment for some cancers.	

You can remember the order of the electromagnetic spectrum easily with the phrase:

Roman men invented very unusual X-ray guns.

Required Practical Investigation 10

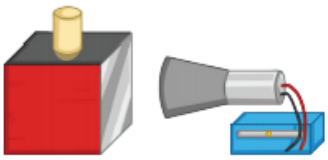
Aim: investigate how the amount of infrared radiation absorbed or radiated by a surface depends on the nature of that surface.

In this investigation, you are finding out which type of surface emits the most **infrared** radiation:

- **dark and matt**
- **dark and shiny**
- **light and matt**
- **light and shiny**

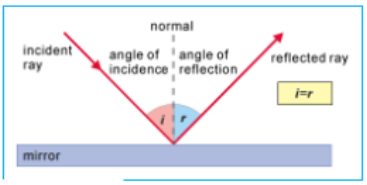
Method:

1. Place the **Leslie cube** on a heatproof mat.
2. Once the kettle has boiled, fill the Leslie cube with hot water.
3. Ensuring that the **thermometer** or the **infrared detector** is an **equal distance** from each of the surfaces (in turn) on the Leslie cube, measure the amount of infrared radiation emitted.
4. Repeat the experiment twice more to collect three results for each surface.

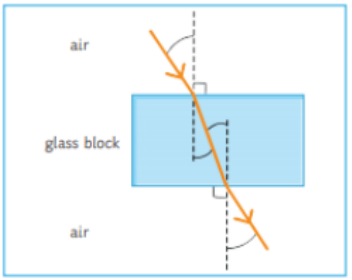


Properties of electromagnetic waves

Science



Reflection



Refraction

You should be able to complete or construct a **ray diagram** to show how a wave is **refracted** at the boundary of a different medium.

As the wave moves **to** a more dense medium (e.g. from gas to solid), it slows down and bends so that the angle from the normal becomes smaller. The angle of incidence is larger than the angle of refraction.

As the wave moves **from** a more dense medium (e.g. from solid to gas), it speeds up and bends so that the angle from the normal becomes larger. The angle of refraction is larger than the angle of incidence.

The angle at which a wave enters the glass block is equal to the angle that it leaves the glass block (when entering and leaving the same medium); however, if a wave crosses a boundary between two mediums at an angle of 90°C, then it will not change direction but instead carry on in a straight line.

Gamma rays occur as the result of changes to the nuclei of atoms and atoms themselves. It is a form of radiation and the waves can be generated and absorbed across a wide range of frequencies.

UV, X-rays and **gamma** are all types of **radiation** and can be **harmful** to human health; they cause damage to human body tissues. The severity of the damage caused depends on the dose of radiation a tissue or cell is exposed to. **Radiographers** and dentists who routinely carry out X-ray examinations wear a device to monitor the amount of exposure and ensure they are within a **safe limit**.

X-rays and gamma rays are **ionising** and can cause **mutations** to genes which may result in **cancer**.

UV waves can cause the skin to burn and age prematurely. UV exposure also increases the risk of developing **skin cancer**.

Radio Waves (Higher tier only)

Oscillations in **electrical circuits** can produce **radio waves** which when absorbed by a conductor, produce an **alternating current**.

The alternating current has the same **frequency** as the radio wave and so information can be coded for transmission. This is how **television** and **radio** are broadcast.

Inheritance, Variation and Evolution Knowledge Organiser

Science

Keywords

allele – An alternative form of a gene.

asexual reproduction – The production of offspring from a single parent by mitosis. The offspring are clones of the parent.

chromosome – Structures that contain the DNA of an organism and are found in the nucleus.

cystic fibrosis – A disorder of cell membranes that is caused by a recessive allele.

DNA - A polymer that is made up of two strands that form a double helix.

dominant – An allele that is always expressed, even if only one copy is present.

fertilisation – The fusion of male and female gametes.

gamete – Sperm cell and egg cell in animals; pollen and egg cell in plants.

gene – A small section of DNA that codes for a specific protein.

genome – The entire genetic material of an organism.

genotype – The combination of alleles.

heterozygous – A genotype that has two different alleles, one dominant and one recessive.

homozygous – A genotype that has two of the same alleles. Either two dominant alleles or two recessive alleles.

meiosis – The two-stage process of cell division that reduces the chromosome number of the daughter cells. It makes gametes for sexual reproduction.

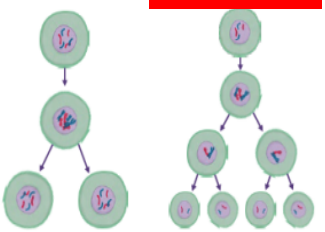
mutation – A change in DNA.

phenotype – The characteristic expressed because of the combination of alleles.

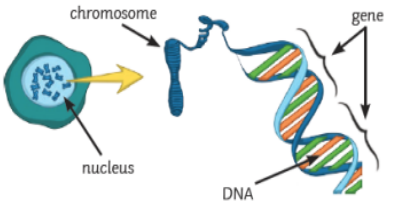
polydactyly – Having extra fingers or toes. It is caused by a dominant allele.

recessive – An allele that is only expressed if two copies of it are present.

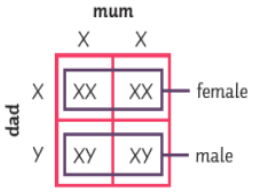
sexual reproduction – The production of offspring by combining genetic information from the gametes of two parents. Leads to variation in the offspring.



Mitosis	Meiosis
Produces two daughter cells.	Produces four daughter cells.
Daughter cells are genetically identical.	Daughter cells are not genetically identical.
The cell divides once.	The cell divides twice.
The chromosome number of the daughter cells is the same as the parent cells. In humans, this is 46 chromosomes.	The chromosome number is reduced by half. In humans, this is 23 chromosomes.
Used for growth and repair, and asexual reproduction.	Produces gametes for sexual reproduction.

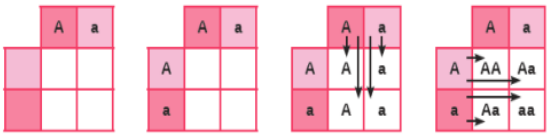


Sex Determination



Females carry two X chromosomes.
Males carry one X and one Y chromosome.

How to Complete a Punnet Square



Step 1:
Put the two alleles from one parent into the boxes at the top. This parent is a heterozygote. This means they have one dominant and one recessive allele.

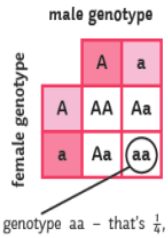
Step 2:
Put the two alleles from the second parent into the boxes on the left. This parent is also a heterozygote.

Step 3:
Put the alleles from the first parent into the two boxes underneath them.

Step 4:
Put the alleles from the second parent into the two boxes to the right of them.

Probability

There are four possible combinations of gametes that offspring can inherit.



One of these four has the genotype aa – that's $\frac{1}{4}$, 25% or 0.25.

The recessive phenotype has a ratio of 1:3 because only one combination will show the phenotype while the other three will not.

Keywords

embryo screening – Genetic tests carried out on an embryo to see whether it carries a faulty allele.

evolution – A change in the inherited characteristics of a population over time through a process of natural selection.

evolutionary tree – A method used to show how scientists believe organisms are related.

extinction – The permanent loss of all members of a species.

fossils – The remains of organisms from millions of years ago which are found in rocks.

genetic engineering – The process by which scientists manipulate and change the genotype of an organism.

natural selection – The process by which organisms that are better suited to an environment are more likely to survive and reproduce.

selective breeding – Humans selecting animals or plants, that have a required characteristic, for breeding.

speciation – The process by which two species evolve from a single original species by natural selection. The two populations have become so different that they can no longer interbreed to produce fertile offspring.

variation - Differences in characteristics of individuals in a population.

Variation

Variation maybe be due to differences in:

- the genes that have been inherited (genetic causes);
- the conditions in which they have developed (environmental causes);
- a combination of genes and the environment.

Evolution

All species of living things have evolved from simple life forms by natural selection.

- If a variant/characteristic is advantageous in an environment, then the individual will be better able to compete.
- This means they are more likely to survive and reproduce.
- Their offspring will inherit the advantageous allele.



Fossils

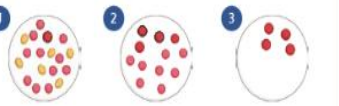
Fossils could be:

- the actual remains of an organism that has not decayed;
- mineralised forms of the harder parts of an organism, such as bones;
- traces of organisms such as footprints or burrows.

Many early life forms were soft-bodied so have left few traces behind.

Fossils help us understand how much or little organisms have changed as life developed on earth.

Resistant Bacteria



There is variation in the bacterial population. One bacterium develops a mutation by chance that means it is resistant to an antibiotic.

The antibiotic kills some of the bacteria, the resistant bacterium survives and reproduces.

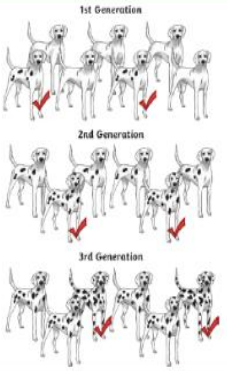
The antibiotic kills the rest of the non-resistant bacteria so the person may start to feel a little better. The resistant bacterium has survived the antibiotic and continues to multiply.

To reduce the rate at which antibiotic-resistant strains appear:

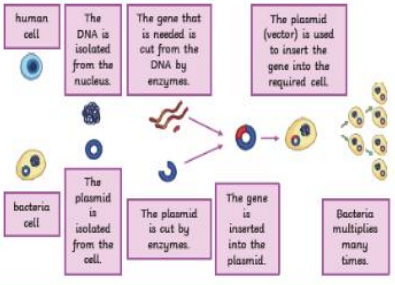
- Antibiotics should only be used when they are really needed, not for treating non-serious or viral infections.
- Patients should complete their courses of antibiotics, even if they start to feel better.
- The agricultural use of antibiotics should be restricted.

Selective Breeding

1. Choose parents who have the desired characteristic.
2. Select the best offspring and breed these to make the next generation.
3. These offspring are then bred again and again, over many generations, until a desired result is achieved.



Genetic Engineering



Classification

Linnaeus classified living things into kingdom, phylum, class, order, family, genus and species.

Organisms are named by the binomial system of genus and species.

Due to evidence from chemical analysis, there is now a 'three-domain system' developed by Carl Woese.

Domain	bacteria	archaea	eukaryota			
Kingdom	eubacteria	archaebacteria	protista	fungi	plantae	animalia

Poles of a Magnet

A magnet has two ends called **poles**: the **north pole** and the **south pole**. The magnetic forces of the magnet are strongest at the poles.



When two magnets are brought close together, they will **attract** or **repel**, depending on which poles are brought together:

- **Like poles** will **repel** one another e.g. N-N or S-S.
- **Opposite poles** will **attract** e.g. N-S.

The forces exerted between the poles of two magnets are a type of **non-contact force**: the magnets do not have to be touching for the effect to be observed.

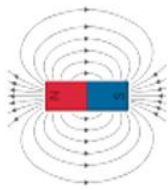
Remember that only **iron**, **cobalt** and **nickel** (or alloys containing these metals) are magnetic.

A **permanent magnet** is one with its own magnetic field. The magnetism cannot be turned on or off e.g. a bar magnet or a horseshoe magnet.

An **induced magnet** is a material which becomes magnetic only when placed within a magnetic field. Induced magnets only attract other materials and lose most (if not all) of their magnetism when removed from the magnetic field e.g. iron filings.

Magnetic Fields

The **magnetic field** is the area surrounding a magnet where the force is acting on another magnet or magnetic material. It can be observed using a compass placed at different points around a bar magnet. The field lines can be drawn by using the compass to mark the direction at a range of points.



A magnet always causes a magnetic material to be **attracted**. The strength of the magnetic field is determined by the proximity to the magnet.

When looking at a diagram of magnetic field lines, the force is strongest where the lines are closest together. The magnetic field of the magnet is strongest at the poles. The direction of the magnetic field shows the direction the force would act on another north pole.
As a result, magnetic field lines always come away from the north pole (like poles repel) and towards the south pole (unlike poles attract).



The earth produces a magnetic field and a magnetic compass uses this to help aid navigation. The core of the earth is made of iron (a magnetic material). A compass contains a small bar magnet shaped as a needle, which points in the direction of the earth's magnetic field.

Plotting Magnetic Field Lines

A magnetic compass can be used to plot and draw the magnetic field lines around a magnet.

You should be able to describe this method for a bar magnet.

1. Place the bar magnet in the centre of a sheet of plain paper.
2. Using a magnetic compass, position it on the paper somewhere around the magnet.
3. Observe the direction of the needle and carefully draw a dot at the circumference of the magnet, in line with each end of the needle. Make sure you include an arrow to indicate the direction of north.
4. Repeat steps 2 and 3 for several positions around the magnet.
5. Join the arrows to complete the magnetic field lines and whole pattern.



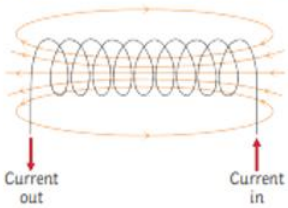
Electromagnetism

A circular **magnetic field** is produced when a current is passed through a conducting wire. This produces an **induced magnet**.

Switching off the current causes the magnetism to be lost.

The strength of the magnetic field can be increased by increasing the current flowing through the wire. The strength of the magnetic field is stronger closer to the wire.

Coiling the wire to form a **solenoid** will also increase the strength of the magnetic field. The strength of the magnetic field created by a solenoid is strong and uniform throughout.



To increase the strength of the magnetic field around a solenoid you can...

- add an iron core;
- increase the number of turns in the coil;
- increase the current passing through the wire.

An **electromagnet** is a solenoid with an iron core. Electromagnets are **induced magnets** and can be turned on and off.



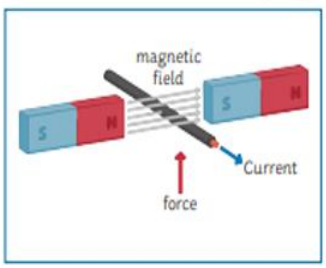
Electric motors, loudspeakers, electric bells and remotely controlled door locks all use **electromagnets**.

Higher Tier

AQA Combined Science: **Physics Topic 7 Magnetism and Electromagnetism**

The Motor Effect and Flemings Left-Hand Rule

When a wire carrying a current is exposed to the magnetic field of another magnet, then a **force** is produced on the wire at a **right angle** to the direction of the magnetic field produced.



This is called the **motor effect**.

The force produced by the motor effect can be calculated using this equation:

force (N) = magnetic flux density (T) × current (A) × length (m)

For example:
A current of 8A is flowing through a wire that is 75cm long. The magnetic field acting at a right angle on the wire is 0.5T. Calculate the force.

$F = B \times I \times l$

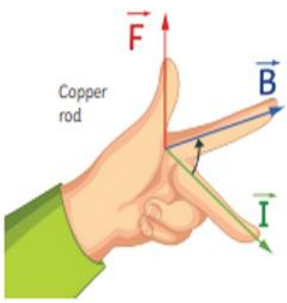
Remember: the equation uses length measured in m. The question gives you the length in cm so you need to convert it before you calculate your answer.

$F = 0.5 \times 8 \times 0.75$

$F = 3N$

From the equation we can see that the force acting on a given length of wire (e.g. 1m) will be increased if the current increases or the magnetic flux density increases. If the current flowing through a wire is **parallel** to the magnetic field, then **no force** is produced – there is no motor effect.

You might be shown a diagram and asked to indicate the direction of the force produced. **Fleming's left-hand rule** can help you do this because it represents the **relative orientation** of the force produced by the motor effect.

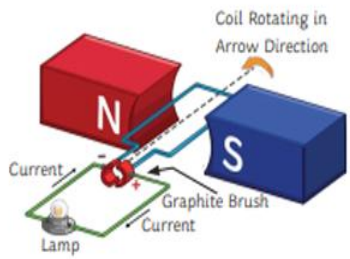


Remember:

- Use your **left hand**!
- The angle between your index finger and middle finger should be a **right angle** on the horizontal plane.
- The angle between your index finger and thumb should be a **right angle** on the vertical plane.
- Your **thumb** represents the direction of the **force**.
- Your **index finger** represents the direction of the **magnetic field**.
- Your **middle finger** represents the direction of the **current** flowing through the wire.

Electric Motors

When the wire carrying the current is **coiled**, the motor effect acting on it causes the wire to **rotate**. This is how an **electric motor** works.



As the **current** flows (from negative to positive), the force produced in each side of the coil acts in **opposite directions**, causing the coil to **rotate** overall.

When the coil reaches a **vertical position**, the force produced is now **parallel** to the magnetic field line and so would be **zero**. This would cause the motor to stop rotating.

To maintain the rotation of the coiled wire, a **split ring commutator** is used to supply the current to the wire. The DC supply reaches the split ring via graphite or metal **brushes** which maintain the connection while allowing it to rotate freely on the **axle**.

The two halves of the split ring commutator ensure that the **current supplied** to the wire **changes direction** each half-turn (or that the current supplied is the same direction on each side of the motor) and as a result, the force produced maintains a **constant rotation** in one direction overall.

Within the 'brain dump', add all the knowledge you can remember from ***Science*** and ***Maths*** 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.



BRAIN DUMP

Present Tense

MFL

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.



Grade 9

phrases French

Reach for the stars

150 word wow phrases

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

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

French GCSE Retrieval words

Test each set of words twice 1st time French – English, 2nd time English to French

Connectives

et	and
aussi	also
mais	but
cependant	however
avec	with
sans	without
ou	or
où	where
puis / ensuite	then
après	after
en revanche / par contre	on the other-hand
donc	therefore
comme	like (for example)
parce que / car / vu que / puisque / étant donné que	because / since

Present and Past tense time markers

normalement	normally
généralement	generally
d'habitude	usually
en ce moment	at the moment
aujourd'hui	today
maintenant	now
actuellement	Currently
ce soir	this evening weekend
ce week-end	this weekend
hier	yesterday
avant-hier	the day before yesterday
Il y a + time	…ago
la semaine dernière	last week
le week-end dernier	last weekend

Future tense and adverbs of frequency

demain	tomorrow
après-demain	the day after tomorrow
demain matin/après-midi/soir	tomorrow morning/afternoon/evening
le mois prochain	next month
plus tard	later
bientôt	soon
quelquefois	sometimes
parfois	sometimes
souvent	often
toujours	always
de temps en temps	from time to time
rarement	rarely
habituellement	usually

Opinions

J'adore	I love
J'aime	I like
Je n'aime pas	I don't like
Je déteste	I hate
Je pense que	I think that
Je crois que	I believe that
À mon avis,	In my opinion
Selon moi,	According to me
D'après moi,	According to me
Je dirais que,	I would say that
Pour ma part,	For my part
Quant à moi,	According to me
Je suis d'avis que	I am of the opinion that
Je dois avouer que	I must admit that
J'ai l'impression que	I have the impression that

Week 1: Time phrases

French	First guess	After learning	Reviewed
à l'heure			
l'an (m)/ l'année (f)			
après-demain			
l'après-midi			
aujourd'hui			
avant-hier			
bientôt			
demain			
dernier/dernière			
en ce moment			
en retard			
hier			
il y a (2 mois)			
le jour/ la journée			
le lendemain			
le matin			
la nuit			
prochain(e)			
le soir			

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

Teacher test score: ..... /20

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

Week 2: Expressions of frequency

French	First guess	After learning	Reviewed
chaque			
d'habitude			
de temps en temps			
déjà			
de nouveau			
en train de (faire)			
encore une fois			
une fois			
longtemps			
maintenant			
normalement			
parfois			
par mois			
par semaine			
quelquefois			
rarement			
souvent			
toujours			
tous les jours			
tout de suite			

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

Teacher test score: ..... /20

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

Week 3: Opinions

French	First guess	After learning	Reviewed
absolument			
ça dépend			
ça m'énerve			
ça me fait rire			
ça me plaît			
ça m'est égal			
ça ne me dit rien			
ça suffit			
croire			
espérer			
étonner			
franchement			
(s')intéresser à			
(en avoir) marre			
(moi) non plus			
penser			
peut-être			
sembler			
supporter			
vraiment			

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

Teacher test score: ..... /20

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

Week 4: Adjectives

French	First guess	After learning	Reviewed
affreux/affreuse			
agréable			
amusant(e)			
barbant(e)			
beau/belle			
cher/chère			
chouette			
compliqué(e)			
content(e)			
désagréable			
drôle			
embêtant(e)			
ennuyeux/ ennuyeuse			
facile			
faible			
formidable			
génial(e)			
grave			
habile			
intéressant(e)			

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

Teacher test score: ..... /20

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

Week 5: More adjectives

French	First guess	After learning	Reviewed
inutile			
incroyable			
inquiet/inquiète			
joli(e)			
laid(e)			
marrant(e)			
mauvais(e)			
merveilleux/ merveilleuse			
mignon/ mignonne			
moche			
nouveau/ nouvelle			
nul/nulle			
parfait(e)			
passionnant(e)			
pratique			
ridicule			
rigolo			
sage			
sensass			
utile			

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

Teacher test score: ..... /20

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

Week 6: Abbreviations and negatives

French	Firstguess	After learning	Reviewed
l'EPS (f)			
le SDF			
la SNCF			
le TGV			
le VTT			
ne ... aucun			
ne ... jamais			
ne ... pas			
ne ... personne			
ne ... plus			
ne ... que			
ne ... rien			
ni ... ni			
ne ... pas encore ...			

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

Teacher test score: ..... /20

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

Week 8: Celebrations and festivals

French	First guess	After learning	Reviewed
la fête des mères			
la fête des Rois			
la fête du travail			
le jour de l'An			
Pâques			
poisson d'avril			
la Saint-Sylvestre			
la Toussaint			
la veille de Noël			
le cadeau			
l'église (f)			
fêter			
le feu d'artifice			
juif/juive			
musulman(e)			
la mosquée			
l'Aïd (m)			
la fête			
chrétien(ne)			
un jour férié			

Knowledge organiser: the origins of the Cold War, 1941–1958

Key individuals:

Presidents of the United States of America (USA)

Capitalists

Western bloc.



Franklin D. Roosevelt (1933–1945)

President during the Grand Alliance. Wanted to work with the USSR to at the Tehran and Yalta Conferences.



Harry Truman (1945–1953)

President during the freezing of relations with USSR. Famous for dropping the first A-Bomb, the Truman Doctrine, Marshall Plan and Berlin Airlift.
Sought to contain communism.



Dwight Eisenhower (1953–1961)

President during the Hungarian Uprising, and escalated the arms race by authorising USH-Bomb (1952) and ICBM tests (1957).

Leaders of the Union of Soviet Socialist Republics (USSR)

Communists

Eastern bloc.



Josef Stalin (1929–1953)

Became unchallenged leader of the USSR in 1929. Joined the Grand Alliance after the Nazis invaded the USSR in 1941.
Stalin was a ruthless dictator, who wanted to prevent the USSR being invaded again. He built a buffer-zone in Eastern Europe as he felt that the capitalist powers would eventually invade again. He sought to build up the USSR's strength for a future war and spread communism. An example of this is the Berlin Blockade in 1948.



Nikita Khrushchev (1953–1965)

Famous for a policy of peaceful-coexistence with the USA. He created the Warsaw Pact (1955) and ordered the invasion of Hungary (1956).

Timeline:

November 1943: Tehran Conference

August 1945: A-Bomb

5 March 1946: Churchill's 'Iron Curtain' speech

January 1947: Communist takeover of Poland

5 June 1947: Marshall Plan announced

February 1948: Communist takeover of Czechoslovakia

January 1949: Comecon set up

7 October 1949: Formation of German Democratic Republic

14 May 1955: Warsaw Pact formed

July 1945: Potsdam Conference

February 1945: Yalta Conference

27 September 1946: Novikov telegram

22 February 1946: Kennan's 'long' telegram

7 October 1949: Cominform set up

12 March 1949: Truman Doctrine

24 June 1948–12 May 1949: Berlin Blockade

25 May 1949: Formation of Federal Republic of Germany

4 April 1949: NATO set up

23 June–11 November 1956: Hungarian Uprising

Glossary of key terms:

A-bomb: the atom bomb was the first nuclear weapon. Two were dropped on Japan in August 1945. The USSR raced to develop its own A-bomb, which was done in 1949.	**Ideology:** a set of shared beliefs. In 1941, the USA and USSR had different ideologies about how a country should be governed.
Arms race: a race to have more bigger, powerful weapons than another country.	**Iron Curtain speech:** a speech given by former Prime Minister, Winston Churchill, on 5 March 1946. He made it plain that he thought the USSR was a threat to freedom and world peace.
Berlin Crisis, 1948: disagreements over the running of the German and Berlin zones of occupation led to the Berlin Blockade and Berlin Airlift. It ended when the USSR backed down and lifted the blockade.	**Marshall Plan:** also known as the European Recovery Program (ERP), offered economic aid to the countries of western Europe to help them rebuild and to prevent them becoming communist.
Capitalism: the belief that everyone should be free to own property and businesses to make money.	**Military Alliances:** armed groups of countries that support each other if attacked. The USA led NATO and the USSR led the Warsaw Pact.
Comecon: its full name was the Council for Mutual Economic Assistance. It was the USSR's version of the Mar- shall Plan in the Eastern bloc.	**Potsdam Conference:** the final conference between the Grand Alliance to solve the problems of WW2. It met in Potsdam in Germany.
Cominform: its full name was the Communist Information Bureau. It was set up by Stalin to allow him to control the governments of the satellite states.	**Satellite state:** a nation that was once independent but is now under the control of another.
Communism: the belief that all property should belong to the state and that everyone gets a fair share of the wealth.	**Superpowers:** the name given to a state that is stronger, either militarily or economically than all others. The USA and USSR were superpowers.
Containment: limiting the spread of something. During the Cold War, the USA wanted to contain communism.	**Tehran Conference:** the first meeting of all leaders of the Grand Alliance, in Iran. The meeting discussed how to win WWII and what to do after the war.
Dollar Imperialism: Stalin used this phrase in his criticism of the Marshall Plan. He argued that the USA wanted to divide Europe in two and establish American economic control over western Europe.	**Telegrams:** a written message sent by telegraph. The predecessor of an email. Famous telegrams include Kennan's 'long' telegram and the Novikov telegram.
FRG: short for the Federal Republic of Germany. This was the full name of West Germany. The FRG was a democracy and capitalist. It joined NATO.	**Truman Doctrine:** a speech by Truman on 12 March 1947, in which he offered support to Greece and Turkey and said the USA would contain communism.
GDR: short for the German Democratic Republic. This was the full name of East Germany. The GDR was a communist state. It joined the Warsaw Pact.	**United Nations:** a world organisation designed to stop war. The USSR, USA, France, UK and China had the right to 'veto' (stop) resolutions.
Grand Alliance: the name given to the UK, USA and USSR when they united to defeat Nazi Germany in WWII.	**USA:** United States of America (also shortened to United States). 50 states ruled from Washington D.C.
H-bomb: the hydrogen bomb was the next generation of atomic weapon after the A-bomb. The USA got theirs in 1952 and the USSR in 1953.	**USSR:** Union of Soviet Socialist Republics (also shortened to Soviet Union). Fifteen republics ruled from Moscow, the capital of Russia.
Hungarian Uprising: an attempt by the people of Hungary to break free from Soviet communism. The USSR invaded when the Hungarian leader, Nagy said Hungary would leave the Warsaw Pact. The USSR reimposed a Soviet communist government in Hungary.	**Yalta Conference:** a meeting of the Grand Alliance at Yalta in the USSR. It made the agreements at Tehran more concrete including the division of Germany and the creation of the United Nations.
ICBM: short for Inter-continental ballistic missile. Essentially a rocket, that a nuclear bomb can be attached to and fired at an enemy.	**Zone:** an area of land. After WWII Germany and Austria were divided in to four zones occupied by the USA, USSR, UK and France.

History

Knowledge organiser: Cold War crises, 1958—1970

Key individuals:

Presidents of the United States of America (USA)

Capitalists

Western bloc.



Dwight Eisenhower (1953—1961)

President during the Berlin crises 1958—1960, and famously broke off relations with Cuba in 1961.



John F. Kennedy (1961—1963)

President during the Berlin crisis that led to the Berlin Wall being built. He also had to deal with the Cuban Missile Crisis. Assassinated in 1963.



Lyndon B. Johnson (1963—1969)

President during the Prague Spring, and the Soviet invasion of Czechoslovakia.

Leaders of the Union of Soviet Socialist Republics (USSR)

Communists

Eastern bloc.



Nikita Khrushchev (1953—1965)

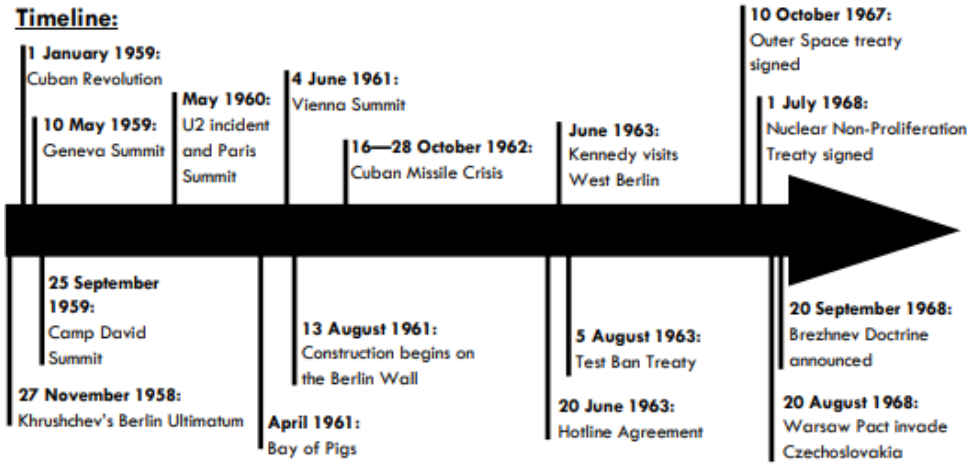
Leader of the USSR. He had violently put down the Hungarian Uprising in 1956. Khrushchev followed a policy of peaceful co-existence with the west. Khrushchev wanted allies out of West Berlin and precipitated a series of crises to force them out. When this failed he asked the GDR to build the Berlin Wall. He also backed Fidel Castro in Cuba leading to the Cuban Missile Crisis. He was removed from power by a group led by Brezhnev who thought he had failed as a leader.



Leonid Brezhnev (1965—1982)

As leader of the USSR he wanted to secure communism. He ordered the invasion of Czechoslovakia in 1968.

Timeline:



Glossary of key terms:

Bay of Pigs: the location of a failed US-sponsored attack on Cuba to overthrow Castro, April 1961. Around 1,400 Cuban exiles armed with US weapons attached. It was a failure and humiliated Kennedy and the USA.	**No man's land:** land which is unoccupied or under dispute between two countries. The gap between the land between the Berlin Wall was called no man's land, although technically it was part of East Germany.
Berlin Ultimatum: in November 1958, Khrushchev demanded that Berlin should be demilitarised and Western troops withdrawn so it could become a free city. He withdrew it in 1959, but renewed it in 1961.	**Nuclear Non-Proliferation Treaty, 1968:** a treaty signed by the USA, USSR, France, UK and other countries that did not have nuclear weapons. The treaty forbade the sharing of nuclear technology.
Berlin Wall: a concrete and barbed wire wall that encircled West Berlin to prevent East Germans escaping to the west. The communists called it the 'Anti-Fascist Prevention barrier' and claimed it was to prevent the capitalist countries destroying socialism.	**Non-proliferation:** stopping the spread of something, usually weapons or armaments.
Brezhnev Doctrine: a belief announced by Brezhnev after the invasion of Czechoslovakia. It stated that the USSR and its allies had the right to invade another communist country if communism was threatened.	**Outer space treaty, 1967:** in this agreement the USA and USSR agreed to not use space for military purposes. The treaty specifically ruled out putting nuclear weapons into orbit.
Brinkmanship: pushing events as close to war/conflict as possible, with the aim of achieving an advantageous outcome.	**Paris, 1960:** a summit that failed due to the U2 incident. Eisenhower refused to apologise, and Khrushchev left.
Camp David, 1959: Khrushchev was the first Soviet leader to visit the USA. He met Eisenhower for the first time at the Presidential retreat at Camp David. It led to better relations between the superpowers and led to the withdrawal of the Berlin ultimatum.	**Prague Spring:** the period in Czechoslovak history when Dubček's ideas of reforming socialism were implemented (April—August 1968). It ended with the Warsaw Pact invasion.
Cuban Missile Crisis, 1962: the closest the world has ever come to nuclear war. Soviet missiles were found on Cuba and the USA demanded they were withdrawn. After much brinkmanship, the USSR agreed to the removal of the missiles.	**Refugee:** a person who has been forced to leave their country.
Cuban Revolution, 1959: Fidel Castro and Che Guevara led a revolution that overthrew the US sponsored dictator, Batista. This created tension between the USA and Cuba.	**Socialism with a human face:** the idea of Dubček, which envisioned the reform of communism to allow more people to have greater freedoms.
Free-city: a city with its own independent government.	**Test BAN, 1963:** a consequence of the Cuban Missile Crisis. In August 1963 the USA, USSR, and UK agreed to not test nuclear weapons in space, underwater or in the atmosphere.
Geneva, 1959: a summit between the foreign ministers, where they tried to sort out the issue of how Berlin would be governed. No agreement was made.	**The Thirteen Days:** another name for the peak of the Cuban Missile Crisis. Between 16—28 October 1962.
Hotline: a direct telephone line between the Whitehouse and the Kremlin. It allowed the leaders of USA and USSR to talk to each other quickly to avoid another event like the Cuban Missile Crisis.	**U2 Crisis, 1960:** On 1 May an American U2 spy plane was shot down over the USSR. The USSR demanded an apology, but the USA refused.
Ich bin ein Berliner: Kennedy made this speech to the people of West Berlin in June 1963. An urban legend is that he said 'I am a jam doughnut', but this is a misconception. You can say 'Ich bin Berliner' or 'Ich bin ein Berliner'.	**Ultimatum:** a final demand, often backed up with a threat to take action.
Kennedy's visit to West Berlin, 1963: Kennedy made the visit to West Berlin to raise morale after the building of the Berlin Wall. It demonstrated US commitment to West Berlin.	**Vienna, 1961:** a summit where Kennedy and Khrushchev met for the first time. Khrushchev thought he could bully Kennedy. He failed and it led to a strain in US-Soviet relations.
Nationalise: when a business is taken over by the government.	**Warsaw Pact:** the Eastern bloc's military alliance. They invaded Czechoslovakia together in 1968.

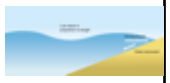
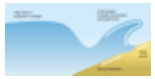
Geography

GCSE Physical landscapes in the UK – Coasts Knowledge Organiser

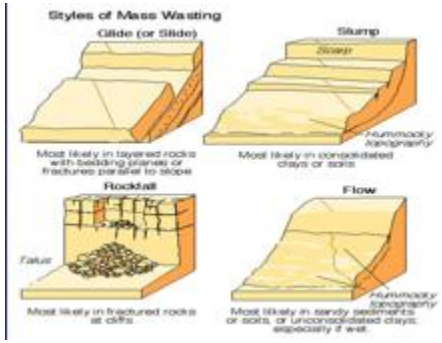
KI : The UK has a range of diverse landscapes

Key terms	Definitions
Chemical weathering	The decomposition of rock by a chemical change within the rock
Deposition	Occurs when material transported by the sea is dropped due to the sea losing energy
Erosion	The wearing away and removal of material by a moving force
Longshore drift	Zig zag movement of sediment along the shore caused by swash and backwash
Mass movement	The downhill movement of weathered material under the force of gravity
Mechanical weathering	Weathering process that causes physical disintegration of rock without any change in the chemical composition of the rock
Sliding	Loose material becomes saturated and flows downhill
Slumping	A whole segment of the cliff moves down slope along a saturated shear-plane or line of weakness
Transportation	The movement of eroded material
Waves	Ripples in the sea caused by the transfer of energy from the wind blowing over the surface of the sea

KI : The coast is shaped by a number of physical processes

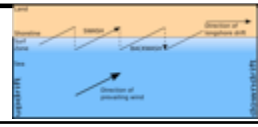
Constructive waves	Destructive waves
Powerful swash Weaker backwash Long wave length Low wave height Gentle beach 	Weak swash Strong backwash Short wavelength Higher wave height Steep beach 
Types of weathering	
Mechanical weathering	Disintegration / break up of rock e.g. freeze thaw
Chemical weathering	Caused by chemical changes e.g. carbonation, oxidation

Mass movement	Downward movement of material under the influence of gravity
Sliding	Blocks of rock slide downhill
Slumping	Rotational slip of saturated soil and weak rock
Rock falls	Fragments of rock break away from the cliff face





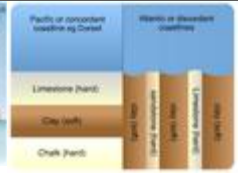


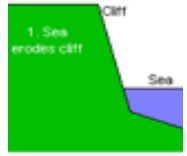
Key terms	Definitions
Abrasion	The wearing away of cliffs by sediment flung by breaking waves
Attrition	Erosion caused when rocks and boulders transported by waves bump into each other and break up into smaller pieces
Hydraulic power	Waves breaking compress air in cracks in a cliff
Transportation : Longshore Drift Swash – the movement of material up the beach Backwash – the movement of material back down the beach	
Deposition – the dropping of material	• Where flow of water slows e.g. sheltered bays • Where there are large flat beaches • Where there are engineered structures e.g. groynes

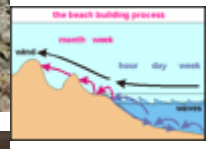
KI : Distinctive coastal landforms are the result of rock type, structure and physical processes

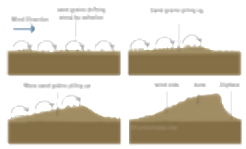
Key terms	Definitions
Arch	A wave eroded passage through a headland
Bar	When a spit grows across a bay to create a lagoon
Beach	The zone of deposited material that extends from the low water line to the limit of storm waves
Cave	Large hole in the cliff caused by waves forcing their way into cracks in the cliff
Cliff	A steep high rock face formed by weathering and erosion along the coastline
Headlands and bays	Headlands are promontories of resistant rock and bays lie in between where these have been eroded back
Sand dunes	Coastal sand hill above the high tide mark
Spit	A finger of sediment extending from the shore caused by deposition
Stack	An isolated pillar of rock left when an arch has collapsed
Wave cut platform	A rocky level shelf representing the base of retreated cliffs

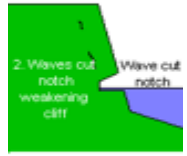


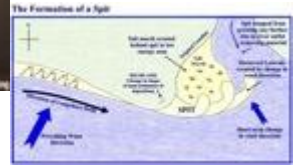
















Concordant coastline - Dorset	Discordant Coastline - Dorset
Durdle Door (arch) Lulworth Cove Kimmeridge (Wave Cut Platforms) Seacombe (cliffs)	Durlston Head (Headland) Swanage bay Old Harry (stack) Studland sand dunes Sandbanks (beach and spit)

KI : Different management strategies can be used to protect coastlines from the effects of physical processes

Soft engineering	Managing erosion by working with natural processes
Beach nourishment	The addition of new material to a beach artificially. Cheap (£500, 000 per 100 metres), easy to maintain, constant maintenance, sand from seabed destroys organisms
Beach reprofiling	Changing the profile or shape of the beach
Dune regeneration	Action taken to build up dunes and increase vegetation to strengthen the dunes and prevent excessive coastal retreat. Maintains natural environment, cheap, time consuming, areas off limit, limited area £200 – £2000 per 100 metres
Hard engineering	Use of concrete and large artificial structures to defend the coast
Gabion	Steel wire mesh filled with boulders. £50,000 pre 100 metres. Cheap, improves cliff management, unattractive, last 5 – 10 years
Groyne	Wooden barrier built out into the sea to stop longshore drift. £150,000 each, cheap, widen beach, unattractive, causes problems down the coast
Rock armour	Large boulders dumped on the beach as part of the coastal defences. £20,000 per 100 metres, quick to build, expensive to transport rock, rocks might not blend in
Sea wall	A concrete wall to reflect the energy of the sea and prevent erosion. £5000 - £10,000 a metre, effective barrier, promenade on top, expensive, high maintenance
Managed retreat	Allowing cliff erosion to occur as nature takes its course. Cheap, natural process, loss of land, relocation of people

Coastal Management Case Study: Lyme Regis in Dorset

Reasons for management	*Town has been built on unstable cliffs. Coastline is eroding more rapidly than any in Europe due to the powerful waves from the South West *Many properties have been destroyed or damaged *Considerable erosion of the foreshore *Sea walls have been breached many times
Management strategy	*Lyme Regis Environmental Improvement Scheme was set up in 90s *Long term coastal protection and reduce threat of landslips *Work completed in 2015 **Phase 1 (completed 1995):** - New sea wall east of Rver Lim; £1.4 million project to stabilise cliff **Phase 2 (Completed 2007):-** £22 million improvements – extensive sea wall and promenade, creation of wide sand and shingle beach, extension of rock armour at the Cobb **Phase 3 (not undertaken):-** Plan to prevent landslips to west of Cobb not undertaken as costs outweighed benefits **Phase 4 (completed 2015):** Focus on east of the town; £20 million and involved – constructing a new 390m sea wall, nailing, piling and draining to stabilise the cliff and protect 480 homes
Resulting effects and conflicts	✓ New beaches= increased visitor numbers=seafront businesses are thriving ✓New defences have stood up to recent storms ✓Harbour is now better protected, benefiting boat owners and fishermen ×increased visitor numbers – conflict with local people ×increased traffic and litter ×some people think new defences have spoilt the natural environment ×new sea wall may interfere with coastal processes – affecting neighbouring stretches of coastline ×stabilising cliff will prevent landslips that may reveal important fossils

Page 22

Geog your memory/ Hi-story Lane

Use the LANES to recall key information about a particular topic, 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.

Acrylic Painting Techniques

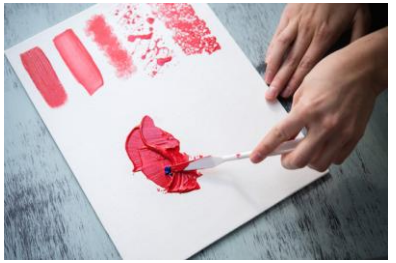
WASH: You can treat acrylic like watercolour when you dilute the paint with enough water. You can use the watered-down paint to apply translucent washes on your surface. However, unlike watercolour, the acrylic paint will set permanently.

LAYERING: which can be combined with either of the two above methods, is simply to paint in layers. This means that you'll build the painting from the bottom up. You'll start by painting big blocks of colour, often as washes, and then adding more and more refinement as you add layers.

DETAILING: A small, fine brush can be used to apply details, such as the whites of eyes or the glisten on the wing of a bird.



SPLATTERING: Using a fairly wet brush, you can flick or splatter paint onto a work surface for an uneven splatter effect. It's fantastic for creating an abstract landscape or a starry night or for just adding texture to a piece.







PALETTE KNIFE: Applying paint with a palette knife is an instant way to make your painting "artsy." It might seem intimidating or advanced, but it's a technique accessible even to beginners. Simply use the palette knife to scrape up a bit of paint and apply it to your work surface. Pretend that you're artfully spreading buttercream on a cake or even butter on bread, and you'll get the idea pretty quickly.

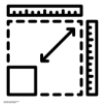
UNDERPAINTING: Start your painting by creating a "sketch" of the image in paint. Often this is done in a colour that contrasts with the palette you have in mind for the finished piece. You can paint over the underpainting entirely using opaque acrylic to cover any evidence of the paint below, or you can let parts of it shine through for a dimensional effect.

MIXING: Creating a family of colours or tones to work with in a painting can help you create subtle variances in your painting. Whether it's slight varieties of skin tones or varying shades of pink, having a family of tones pre-mixed before you paint can really help streamline the process.

DABBING: Using a corner of a sponge or even a piece of paper towel, you can dab on accents of colour. Think of it like very artistic sponge painting. Dabbing adds a lot of texture and movement to a piece. For instance, on the painting above, dabbing with a sponge perfectly captured the texture and movement of trees swaying in a light breeze.

DT: Engineering

Modelling is used to test:


Scale


Proportion


Function

Types of modelling


Virtual


Physical

Evaluation of model

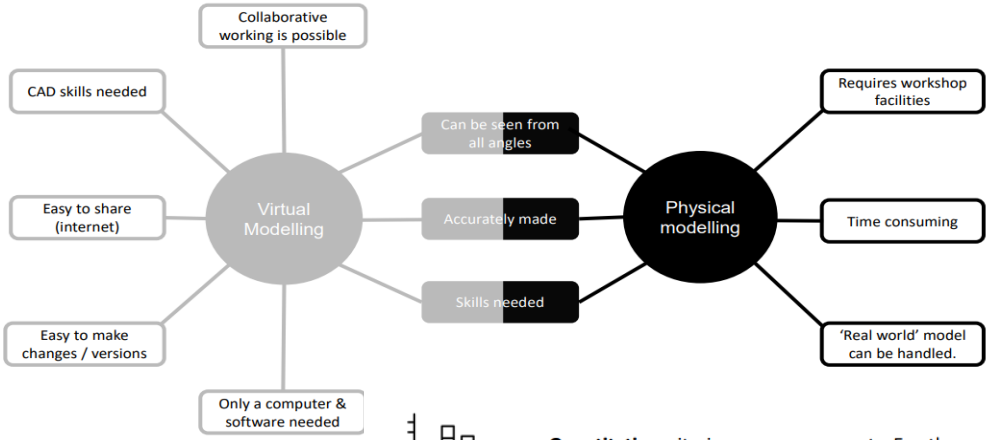
All models or prototypes are compared with the design **brief** and **specification**.

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



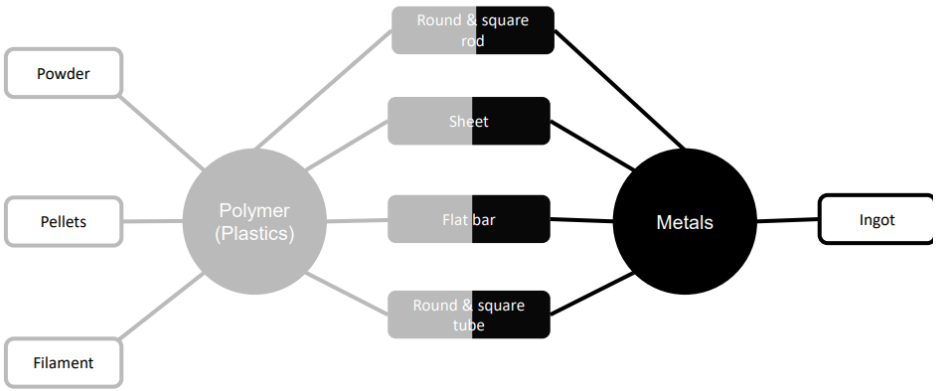






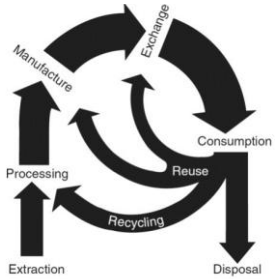
Wasting	Shaping	Forming	Joining	Finishing	Assembly
					
Changing shape by removing material	Forming a shape by moulding or laying up composites.	Changing shape by deformation.	Permenant or temporary fixing.	Creating a surface finish for technical or aesthetic reasons.	Adding components together into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

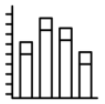
Polymers and metals have some stock forms in common.
Other materials have their own standard stock forms.



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.


ted by Vector Portal

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

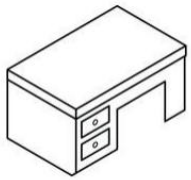

l by Stanislav Levin
e Noun Project

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

DT: Engineering

Isometric
A formal 3D style drawing.



Start at the corner all lines

Oblique
Another 3D style that is less realistic that isometric.

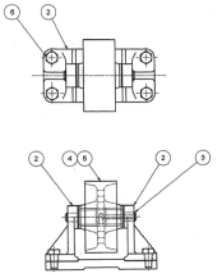


Start with front 'face' then

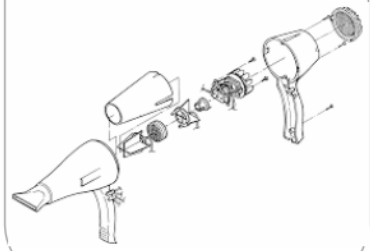
Freehand sketching
An informal style used to communicate ideas quickly.



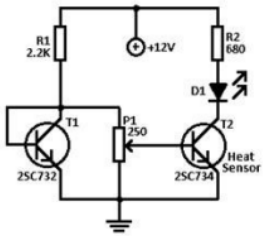
Assembly Drawings
Drawings that show all components assembled together.



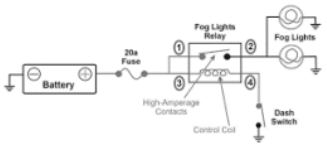
Exploded views
A type of assembly drawings that shows space between parts.



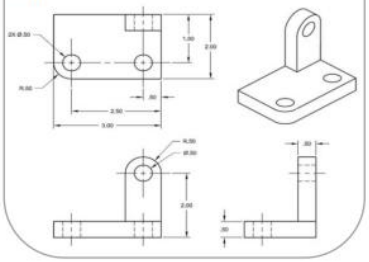
Circuit Diagram
Used to show how electronic components are connected in a circuit.



Wiring Diagram
Shows how connections should be made within larger electrical systems.



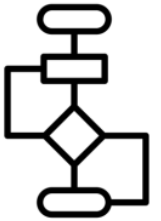
Orthographic drawing
A formal style of 2D drawing usually used to show dimensions. Drawn to scale.



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



Flowcharts
Used to show a decision making process.



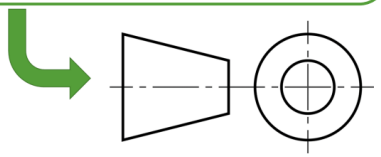
Working Drawings

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	

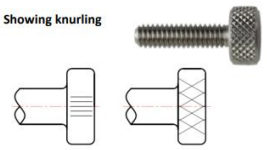
Across Flats	AF
Centre Line	CL
Diameter	DIA, D and Ø
Drawing	DRG
Material	MATL
Square	SQ

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



Straight Knurling *Diamond Knurling*

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

Engineering	Evaluating Design Ideas	Year 10-11	R038

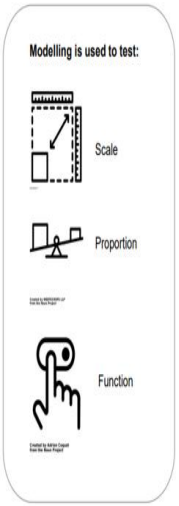
Evaluation Models		
1	ACCESS FM	**ACCESS FM** is a design and technology framework used for analysing and evaluating products. It stands for represent?
2	House of Quality (HOQ) 	**The House of Quality (HOQ)** is a matrix-based tool used in Quality Function Deployment (QFD) to translate customer needs into technical requirements for product development.
3	Pugh Chart 	**A Pugh chart,** also known as a Pugh matrix or decision matrix, is a tool used to compare multiple options against a set of criteria, helping to identify the best choice.
4	Quality Function Deployment (QFD)	**Quality Function Deployment (QFD)** is a structured method used to translate customer needs and expectations into specific engineering characteristics and design parameters for products or services
5	Production Plan	A **production plan**, also known as production planning, is a comprehensive strategy that outlines how a company will manufacture its products or deliver its services.
6	Gantt Chart	A chart in which a series of horizontal lines shows the amount of work done or production completed in certain periods of time in relation to the amount planned for those periods.
7	Evaluation	In production, **evaluation** is the process of systematically assessing the performance and impact of a product, service, or process to determine its effectiveness, efficiency, and value.
8	Product Testing	**Product testing** is the process of evaluating a product's performance, quality, and usability before its release to the market.

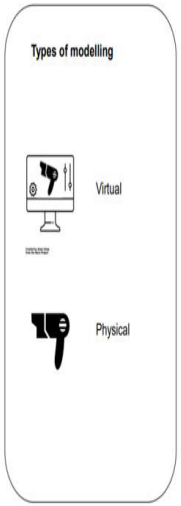
Keywords Vocabulary		
16	**Subjective Evaluation**	Subjective evaluation refers to assessments or judgments based on personal opinions, feelings, interpretations, or preferences, rather than on objective facts or measurable criteria. It involves individual perspectives and can vary from person to person.
17	**Objective Evaluation**	Objective evaluation refers to assessments that are based on measurable, verifiable facts and data, rather than on personal opinions or biases. It emphasizes impartiality and consistency, aiming for judgments that would be similar regardless of who is making them
18	**Summative Evaluation**	Summative evaluation is a method of assessment conducted at the end of a program, course, or project to measure its overall effectiveness and determine the extent to which objectives have been achieved.
19	**Ranking matrix**	In the context of design, a ranking matrix is a tool used to prioritize or rank different design options or features based on their importance or effectiveness according to specific criteria. It helps designers make informed decisions by systematically comparing and evaluating alternatives.
20	**Qualitative data**	Qualitative data is non-numerical information that describes characteristics and qualities. It focuses on concepts, opinions, and experiences, rather than numerical measurements or statistics. This type of data is often gathered through interviews, observations, and text-based sources, providing insights into the "why" and "how" behind phenomena
21	**Quantitative data**	Quantitative data is numerical information that can be counted or measured, often used for statistical analysis to understand quantities, frequencies, and trends. It differs from qualitative data, which describes characteristics or qualities. Essentially, quantitative data provides numerical values that can be subjected to mathematical calculations and statistical analysis.

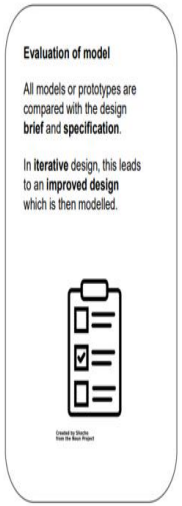
Engineering	Designing Requirements	Year 10-11	R038

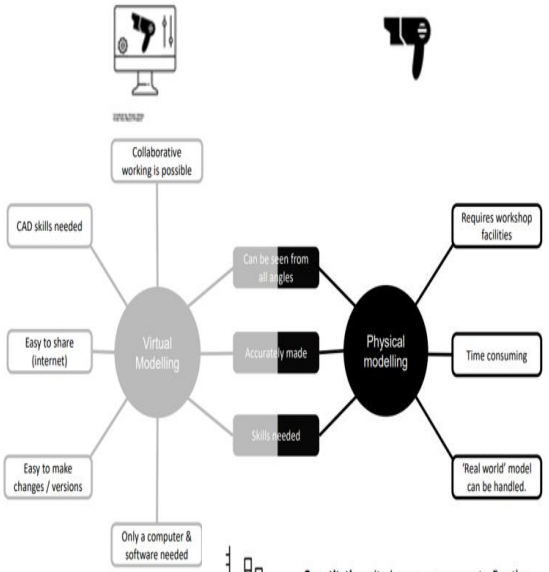
Commercial Production methods				
1	Needs and wants	In design, needs represent fundamental requirements for a product or service to function as intended and Fulfil a basic purpose, while wants are desires or preferences that enhance the user experience but are not strictly necessary. Needs are about functionality and usability, whereas wants focus on aesthetics, features, and emotional connections.		
2	Quantitative and qualitative criteria	Quantitative criteria rely on numerical data and statistical analysis to measure and quantify variables. Qualitative criteria, on the other hand, focus on descriptive, non-numerical data to understand experiences, perspectives.		
3	Scale of manufacture	One-off; One-off manufacturing, also known as job or bespoke production, involves creating a single, unique product tailored to a specific customer's requirements.	Batch; Batch manufacture, also known as batch production or process manufacturing, is a production method where goods are produced in discrete groups or sets, called batches.	Mass; Mass manufacture, also known as mass production, involves producing large quantities of standardized goods, often on assembly lines, using specialized machinery and a division of labour.

Types of manufacturing processes:		
4	Wasting	Wasting is a process that uses tools to remove material from a workpiece until the required component has been produced: wasting can be achieved by hand tools and machine tools. **Examples, drilling, routing, chiselling, turning.**
5	Shaping	Shaping refers to the process that take raw materials and form them into final parts. **Examples, casting, moulding, injection moulding and machining processes.**
6	Forming	Forming, pressing or press forming is where a pressing force is applied to a material to cause it to deform. **Examples, die pressing, line bending, Vac forming, rolling.**
7	Joining	Joining processes are used to physically join two or more components. **Examples, brazing, soldering, adhesives, bolts and rivets.**
8	Finishing	Finishing refers to the process of applying a decorative appearance, protective coating or other treatments to protect a surface material. **Examples, painting, spraying, waxing, heat treating, dip coating.**
9	Assembly	Products with two or more components will have been designed to be assembled so they can function.





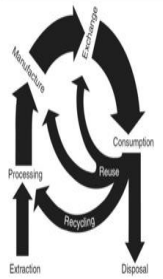




Wasting	Shaping	Forming	Joining	Finishing	Assembly
Changing shape by removing material	Forming a shape by moulding or laying up composites.	Changing shape by deformation.	Permenant or temporary fixing.	Creating a surface finish for technical or aesthetic reasons.	Adding components together into a single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

Circular Economy

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



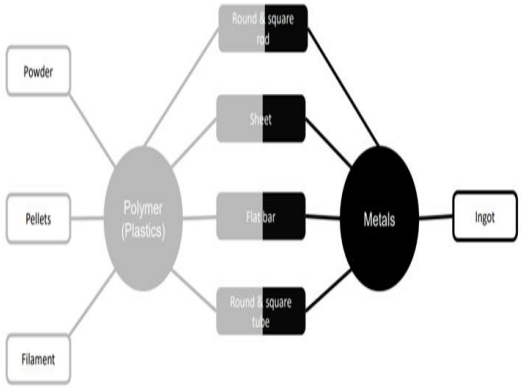
Quantitative criteria are measurements. E.g. the amount of memory in a phone or the capacity of a battery.

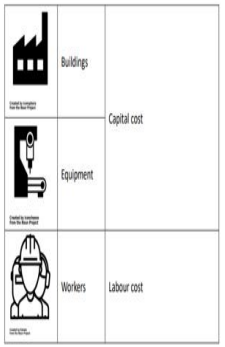
Qualitative data are based on opinions, impressions and points of view. E.g. how comfortable a handle should be or how attractive a bath tap must be.

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.

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



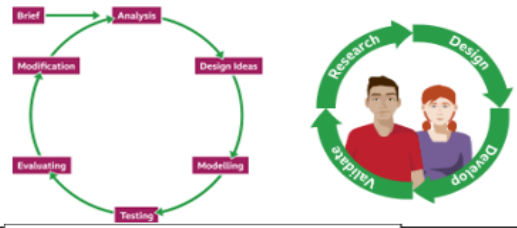
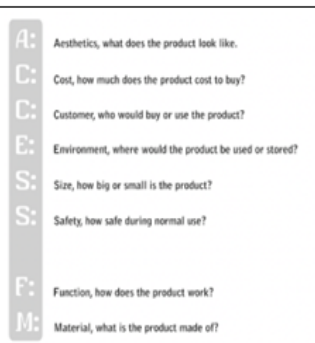


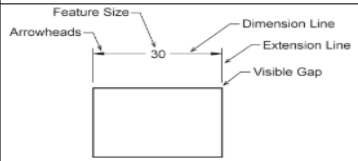
Keywords Vocabulary

16	Tooling	Manufacturing equipment needed to produce a component, such as cutting tools, dies, gauges, moulds or patterns.
17	Deburring	Process to remove sharp or raised edges on a material caused by other processes.
18	Labour Costs	Costs associated with employees in a business, including wages, taxes and additional benefits.
19	Overheads	Expenses that need to be paid by the business, not including labour or materials but rent and utilities.
20	Subtractive process	The removal of material from a solid block by a machining process, such as milling, turning or drilling.
21	Consumables	Resources that assist manufacture and are used up during the process- for example, oil and lubricant used in machines.
22	Standard Forms	Made available in large quantities to the same specification- sheet metal, paper, timber sheeting.
23	Geometry	Shape of the object.
24	Automation	Using computer technology to operate equipment, rather than humans.
25	Turning	A machine operation that generates cylindrical and rounded forms with a stationary tool.
26	Rethink	Can the designer rethink the way it is manufactured. Is the material being used the only option?
27	Reuse	Is about reusing what you've already got rather than buying new items straightaway.
28	Recycle	From batteries to bubble wrap, you might be surprised by how much can be recycled.
29	Repair	Taking the time to repair broken items can extend their lifetime and avoid introducing new materials into the cycle.
30	Reduce	Consider how you can reduce your meat and dairy consumption and buy new clothes only when you really need them by making do with what you've got before replacing them.
31	Refuse	Say no to single-use bags, packaging, cups, straws and so on, and get into the habit of bringing along your own reusable replacement

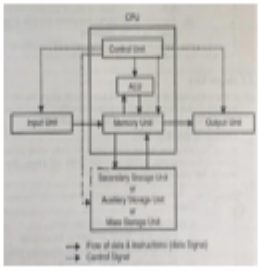
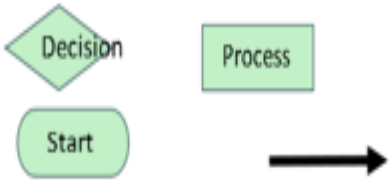
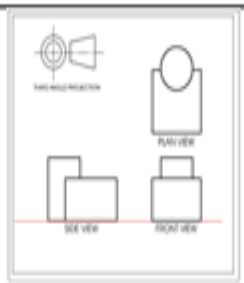
Engineering	Designing Processes	Year 10/11	R038

Designing Processes		
1	Linear design	**Linear design** is a process that follows a step-by-step process
2	Iterative design	**Iterative design** is a circular design process that models, evaluates and improves designs based on the results of testing.
3	Inclusive design	**Inclusive design** is a design process that aims to create products, services, and environments that are accessible and usable by the widest range of people, including those with disabilities, diverse cultural backgrounds, and varying needs.
4	User-centred design	Use-centred design **UCD)** is a design philosophy and process that prioritizes the needs, goals, and feedback of the user throughout the entire design and development lifecycle.
5	Sustainable design	**Sustainable design is** an approach to creating products, buildings, and systems that minimize environmental impact and promote social and economic well-being throughout their entire life cycle.
6	Ergonomic design	**The ergonomic design** discipline focuses on designing products and environments that are comfortable, efficient, and safe for humans to use.

Diagram		
7	Iterative design process as a diagram.	
8	Ergonomics	A- Chair Height B- Back Rest Height C- Viewing distance/ angle D- Height of human to table E- Height of chair  When anthropometric data (measurements / statistics) is applied to a product, e.g. measurements of the hand are used to design the shape and size of a handle, this is ergonomics.
9	ACCESS FM	ACCESS FM is a design tool used for product analysis and evaluation. It stands for Aesthetics, Cost, Customer, Environment, Size, Safety, Function, and Materials. This framework helps designers and students consider various aspects of a product during the design process, from initial concept to 

Keywords Vocabulary			
10	**Anthropometrics**	The study of the human body and its movement, often involving research into measurements relating to people. It also involves collecting statistics or measurements relevant to the human body, called Anthropometric Data.	
11	**Design brief**	A set of instructions given to a designer by a client	
12	**Design specification**	Document containing details of a product's required characteristics, and all the processes, materials and other information needed to design the product.	
13	**Market Research**	Market research is the process of collecting, collating and analysing data about the market.	
14	**Primary Research** 1.Postal surveys – these have a high sample size but low response rate, relatively cheap 2. Telephone surveys – more expensive, higher response rate, can explain questions 3.Interviews – smaller sample size, higher response rate, may be interviewer bias 4. Focus groups – provide in-depth analysis, small sample size	Advantages • Fitness for purpose • Allows to target right segments • Can explain difficult problems / concepts	Disadvantages • Can be time consuming • Expensive • Some forms have low response rates
15	**Secondary Research** 1.Census – provides information on all the households in the UK, updated every 10 years 2. Internet – can provide a wealth of information however need to check validity of data 3. Government statistics 4. Books and journals Company reports 5. MINTEL reports – these are often a good source of market information	Advantages • Quick and easy • Relatively cheap	Disadvantages • May be out of date • May not be relevant
11	Dimensions		
12	CAD- Computer aided Design	Advantages • Competitively priced packages. • Drawings can be produced an amended quickly. • Most cad programs have online training to upskill. • Range of programs that are available internationally. Files can be shared easily. • CAD produces designs that can be rendered and viewed from a 360 degree.	Limitations • Requires high processing capacity so IT needs to be high quality- expensive. • Initial training in complex programs is necessary. • Can be time consuming to produce initial designs. • Computers using the software are susceptible to software changes.

Design Communication		
1	Isometric Drawing	**Isometric drawings** are a type of 3D representation of an object on a 2D surface, where all three axes (length, width, and height) are equally foreshortened.
2	Oblique Drawing	**Oblique drawing** is a simple type of 2D technical drawing used to represent 3D objects.
3	Orthographic Drawing	**An orthographic drawing,** also known as an orthographic projection, is a way to represent a 3D object in 2D by using multiple views.
4	Exploded View Drawing	**An exploded view drawing** is a technical illustration that shows the relationship and order of assembly of components within a product or system. Also known as an **assembly drawing.**
5	Free hand sketching	**Freehand sketching** is the art of drawing without relying on tools like rulers or stencils, using only your hand, pencil, and paper. Also known as a **concept sketch.**
6	Working Drawing	**Working drawings** are detailed, scaled technical drawings used in construction and manufacturing to guide the building or production process.

Diagram		
7	Block Diagram	 Diagram that shows in schematic form the general arrangement of the parts or components of a complex system or process, such as an industrial apparatus or electron circuit.
8	Flow chart Symbols	
9	3rd Angle Orthographic orientation	Front, Plan, Side 

Chamfers

Chamfers at 45° should be dimensioned as shown. Chamfers at an angle other than 45° should dimension the angle separately.



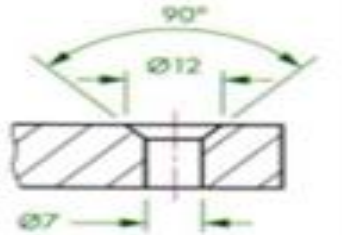
45° chamfer

Countersinks

Two examples of dimensioning countersunk holes are shown. The diameters of the countersink and the hole and the angle of the countersink should be given.



Plan view of countersink



Sectional view of countersink

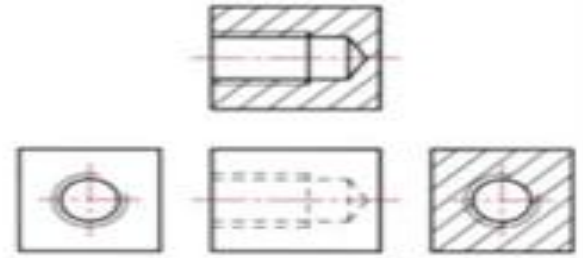
Screw threads

Figures A, B and C show the main conventions and details of how orthographic and sectional views of threaded parts are drawn. These conventions are used irrespective of thread type. However, if the thread type and size needs to be given, this is usually done in note form.

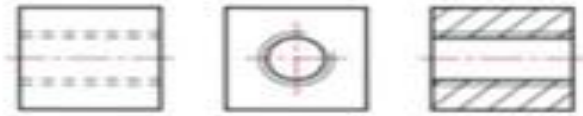
Figure D shows details of the thread run-out and how assembled threaded parts are drawn. Note how the hatching is affected when screw threads are assembled. Cross-hatching lines stop at the screw, but continue to the inside line when a screw is not present.



A External screw threads



B Internal threads (blind hole)



C Internal threads (through hole)

Knurling

Knurling is represented by showing only part of the surface it is applied to. For diamond knurling the lines should be drawn at 30° to the centre line.



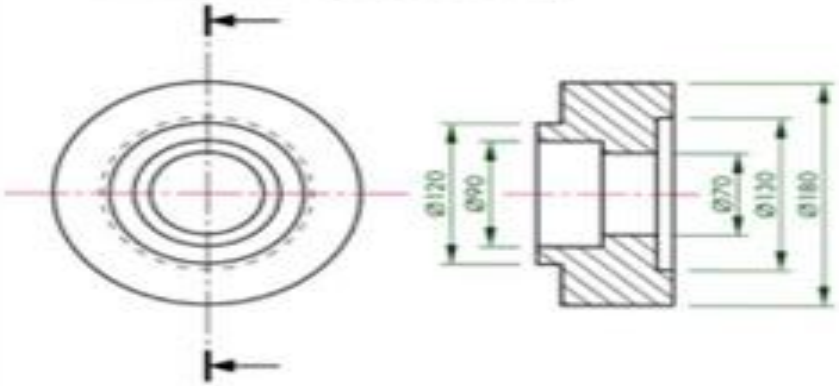
Straight knurling | Diamond knurling

Tolerances

Engineering tolerance is **the allowed variation in measurements deriving from the base measurement**. Tolerances can apply to many different units. For examole For example, ıent may have a dimension of 10 mm with a tolerance of ± 0.2mm this means that the finished dimension can be 0.2mm smaller (9.8mm) or 0.2mm bigger 10.2mm or any measurement that falls within that range.

Sectional Views

Dimensions of diameters should be placed on the view providing the greatest clarity.



Sectional views are used on engineering drawing to show a 'cut away' cross-section of an object so that the internal features can be detailed.

Design Development – sketchbook pages

Development and refinement of ideas:





GCSE Textiles - AO4

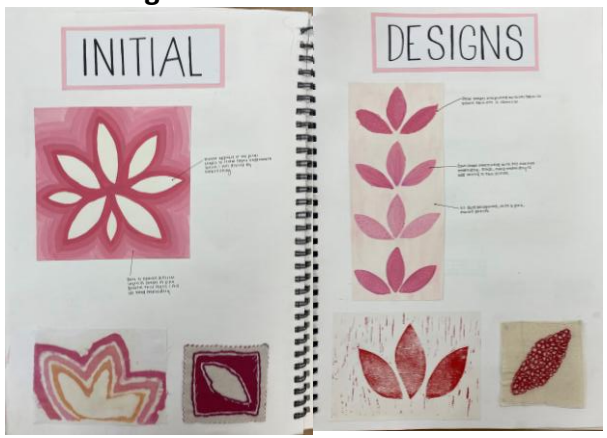
Present a personal and meaningful response that realises intentions and demonstrates understanding of visual language.

Use the words in the assessment objective to help you understand what it is you should do:

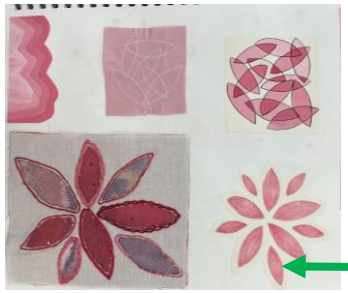
Personal and meaningful response –Your response to a source should be personal to you. What your feelings and reactions are. It must be meaningful by relating to your source inspiration. Make sure everything links and is not random.

Demonstrates understanding of visual language – being able to combine different textures, colours, techniques in an aesthetically pleasing way.

Initial designs:











Final design – label with techniques you intend to use



Create a wide range of fabric samples before creating your final design

Level 1/2 Hospitality and Catering:
Unit 2-2.2.1: Factors affecting menu planning

Factors affecting menu planning

You need to be aware of the following factors when planning menus:

- **cost** (ingredients as well as business costs)
- **portion control** (value for money without waste)
- **balanced diets/current national advice**
- **time of day** (breakfast, lunch, and dinner menus as well as small plates and snacks)
- **clients/customers** (a menu with prices that will suit the people who visit your establishment).

Equipment available

You need to know and understand the type of equipment needed to produce a menu. The choice of dishes will be influenced by the equipment available to the chef.

This includes kitchen equipment such as:

- hobs, ovens, and microwaves
- fridge, freezer and/or blast chiller
- specialist equipment, for example a *sous vide* or pizza oven
- hand-held equipment, for example electric whisks or hand-blenders
- other electric equipment, for example food processors.

Skills of the chef

The skills of the chef must be suited to the type of provision and the menu offered.

A Michelin starred restaurant will require a chef who has complex skills in preparation, cooking and presentation of dishes.

A café will require a chef who has a range of medium and complex skills to produce a suitable menu.

A large restaurant will normally have a full kitchen brigade while a smaller establishment may only have a single chef with one or two assistants.

Time available

The type of provision will influence the amount of time a customer may be willing to wait for their dish to be prepared. Can the chef prepare, cook, and present more than one dish at the same time? Can some items be made in advance?

Time of year

The time of year can affect menu choices. Light and cold dishes such as salads are better suited to the summer months. Hearty dishes such as stews are more suited to the winter. Special dishes linked to holidays such as Christmas and Valentine's Day may also be included. The availability of **seasonal** produce can also affect menu choices as certain commodities, for example strawberries, are less expensive when in season.

Environmental issues

The chef will need to think about environmental issues when planning a menu. Can the chef **reduce** the amount of ingredients bought as well as reducing food waste? Can the chef **reuse** ingredients to create new dishes for example stale bread made into bread-and-butter pudding? Can the kitchen **recycle** waste wherever possible? Running the kitchen sustainably will save money.

Organoleptic properties

Organoleptic properties are the sensory features of a dish (**appearance**, **aroma**, **flavour**, and **texture**).

The chef will need to think about how the dish will look and taste. Is there a range of colours? Do the flavours go well together? Are there a variety of textures?

Level 1/2 Hospitality and Catering: Unit 2: 2.2.1 Factors affecting menu planning – Environmental issues

Sustainability

Many diners are interested in hospitality and catering provisions that provide sustainable dining.

The aim of the three Rs of sustainability is to conserve natural resources and prevent excess waste. By following the rules of reduce, reuse, and recycle, hospitality and catering provisions can save money at the same time as attracting more diners and bringing in more profit.

Sustainability also means buying local produce, using organic ingredients, buying meat and poultry from farm assured producers who guarantee better welfare for the animals, using Marine Stewardship Council sustainable fish and offering meat-free versions of favourite dishes.

Reduce

Food waste: If food and waste were its own country, it would be the third largest producer of greenhouse gas in the world! If it cannot be used to make new dishes or given away, then as much food waste as possible should be composted.

Energy use: Hospitality and catering provisions can save energy in many ways including using low-energy lighting, maintaining and upgrading equipment, putting lids on saucepans, batch baking and cooking.

Food miles: Using local suppliers means that the food does not have to travel as far from 'field to fork'.

Water usage: Use less in cooking by only just submerging vegetables or using a steamer. Use an energy and water efficient dishwasher.

Reuse

Food that is past its best, for example a brown banana, or scraps such as bones can be used to create new dishes which in turn will decrease food waste. www.lovefoodhatewaste.com has a vast range of recipe ideas for using surplus food.

- Bread: breadcrumbs, bread and butter pudding, bread sauce and croutons.
- Meat and poultry: bones can be used to make stocks.
- Fruit: banana muffins, apple crumble, fruit coulis, smoothies.
- Vegetables: bubble and squeak, vegetable stock, vegetable bakes, omelettes.
- Eggs: whites can be used to make meringue; yolks can be used to make mayonnaise.

Recycle

Many hospitality and catering provisions have separate bins for recyclable materials. Professional kitchens should also have areas to separate waste into recyclable, non-recyclable and compostable materials. All staff should be trained to know how to dispose waste correctly.

Coffee grounds can be composted. Compost can be used to grow fruit, vegetables and herbs for use in the kitchen.

Jars and plastic containers can be used for storage in the kitchen. Glass bottles can be used to hold flowers or candles as table decorations.

Too Good To Go, Karma and *Olio* are apps used by restaurants and supermarkets. Customers can buy discounted food which would otherwise go into landfill.

One, two, three...Knowledge Retrieval

Based on your ***OPTION SUBJECT***, recall 3 points from the topic you have been learning from. 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.

Question/ Topic	1	2	3

By the end of this topic, you should be able to evaluate your own performance in planning and leading a sports activity session…

5.1 Review your leadership of a sports activity session

5.1.1 Planning
- Positives - What went well
- Negatives – What didn't go well

5.12 Leading
- Positives - What went well
- Negatives – What didn't go well

5.1.3 Improvements that could ne made

5.1.4 Opportunities to develop leadership skills in the future

Some issues that may have happened in your session:

1. You only spent 3 minutes on a drill and when moved on. Group could not do the next drill.
2. Learners weren't motivated to do the drills.
3. You couldn't see all the group as you were leading the session.

Consider what you could do differently next time.

Exemplar:

My first strength was my creativity within my session plan. I planned two thoughtful drills which I researched on the internet. This meant that I knew exactly how to set them up and I had all the distances written down so the spacings were realistic which meant that the drills ran smoothly. The teacher that observed me said that my drills were very good and that everyone was motivated.

Once I explained my drill the class engaged in the drill fully and seemed to really enjoy it and they looked like they were trying hard. I made it a competition by saying that pupils had to grab a bib once they had scored and take it back to their team and then the first team back with all their bibs were the winners. This motivated both teams as they could see the other teams getting bibs and were able to see if they were losing so that motivated them to try even harder.

Pupils were demonstrating a good shooting technique and they started to score more baskets as the session went on. I was really pleased with this drill and think that it worked well.

YEAR 11 DANCE

Explore. Create. Develop. Perform.



Choreography is the art of making and structuring dance. It begins with a stimulus, is shaped through ideas and motifs, and developed into a purposeful dance.

REMEMBER
- Be creative and take risks.
- Trust your ideas and refine them.
- Consider your audience and intention.
- Reflect and evaluate your work.

EXPLORING STIMULUS

A stimulus is something that inspires your choreography.
It can be anything!

POSSIBLE STIMULI
- Images / photographs
- Objects
- Music / sound
- Poems / stories / quotes
- Themes / issues
- Personal experiences
- Natural world
- Art / paintings
- Cultures / traditions

HOW TO EXPLORE A STIMULUS
1. Look – What do you see?
2. Think – What does it make you think about?
3. Feel – What emotions or moods does it create?
4. Imagine – What could happen?
5. Move – How can you express this through movement?
6. Record – Jot down ideas, words, images or movements that come to mind.

TIP: The more you explore your stimulus, the more rich and original your choreography will be.

CREATING CHOREOGRAPHY: FROM IDEA TO PERFORMANCE

1. GENERATE IDEAS
- Use your exploration to brainstorm movement ideas.
- Try a range of movements, levels, dynamics and actions.
- Don't judge ideas at this stage – be open and creative!

TIP: Quantity leads to quality. Generate lots of ideas.

2. DEVELOP IDEAS
- Select the strongest ideas.
- Experiment with variations (space, time, energy, relationships).
- Combine ideas to see what works well together.

TIP: Ask "What if?" to develop your ideas further.

3. DEVELOP MOTIFS
- A motif is a short sequence of movement.
- Repeat, vary and expand your motifs.
- Try changes in:
  - Dynamics
  - Levels
  - Directions
  - Timing
  - Relationships

TIP: Motifs are the building blocks of your choreography.

4. STRUCTURE YOUR DANCE
- Organise your motifs into a clear structure.
- Consider:
  - Beginning – how will you introduce your idea?
  - Development – how will you show change and contrast?
  - Ending – how will you bring closure?

TIP: A clear structure helps your audience follow your idea.

5. REFINE & EVALUATE
- Watch your choreography with a critical eye.
- Is it clear? Interesting?
- Does it communicate your intention?
- Make changes to improve quality and impact.

TIP: Keep refining! Great choreography is never finished.

DEVELOPING MOTIFS

A motif is a short, memorable phrase of movement.
It can be developed in many ways:

REPETITION	DIRECTION	LEVEL	DYNAMICS	TIMING	SIZE/SPACE	RELATIONSHIPS
Repeating the motif as it is.	Changing the direction it travels.	Changing the height of the movement.	Changing the energy or quality.	Changing the energy or rhythm.	Changing the size or use of space.	Changing how you relate to others.
Example: (step turn jump) x 3	Example: forwards → sideways → backwards	Example: high → medium → low	Example: sharp → sustained → sudden	Example: fast → slow → pause	Example: small → big → diagonal	Example: unison → canon → formation

TIP: Combine different ways of development to keep your choreography interesting.

CHOREOGRAPHIC DEVICES

Use choreographic devices to make your dance more interesting and help communicate your ideas.

- **Unison** – Dancers perform the same movement at the same time.
- **Canon** – Dancers repeat a movement one after another.
- **Formation** – The way dancers are arranged in space.
- **Contrast** – Using differences in movement, dynamics or levels.
- **Repetition** – Repeating a movement or phrase.
- **Accumulation** – Adding movement one bit at a time.
- **Climax** – Building to a key moment of energy or impact.
- **Fragmentation** – Breaking movements down into smaller parts.

TIP: Choose devices that support your idea and enhance your choreography. Don't use them just for the sake of it!

KEY TERMINOLOGY

Stimulus	Something that inspires your choreography.
Motif	A short sequence of movement.
Choreography	The art of creating and structuring dance.
Dynamics	The energy or quality of movement.
Relationships	How dancers relate to each other.
Structure	The order and organisation of your dance.
Intention	The purpose or message behind your dance.
Audience	The people watching your performance.
Evaluate	To assess and make improvements.

SENTENCE STARTERS (USEFUL FOR WRITTEN WORK)

EXPLORING STIMULUS	GENERATING IDEAS	DEVELOPING MOTIFS	STRUCTURE	EVALUATION
• I was inspired by...	• I generated ideas by...	• I developed my motif by...	• My dance is structured by...	• I think my dance is successful because...
• This stimulus made me think about...	• I tried different...	• I used changes in...	• It begins with...	• If I were to improve it, I would...
• I explored this stimulus by...	• Some of my initial ideas included...	• This helped to...	• It develops through...	• This shows my intention because...
			• It ends by...	

TOP TIPS FOR CHOREOGRAPHERS

- ✓ Always start with a clear idea or intention.
- ✓ Explore widely before you decide.
- ✓ Use motifs and develop them in different ways.
- ✓ Make strong choices about movement and structure.
- ✓ Consider how your dance communicates to your audience.
- ✓ Reflect, refine and be proud of your creative voice!



KEY QUESTIONS TO ASK YOURSELF

- What is the intention of my dance?
- How does my movement communicate this?
- Is my use of space effective?
- How does the structure support my idea?
- What choreographic devices have I used and why?
- What impact will my dance have on the audience?

FACTORS AFFECTING GROWTH AND DEVELOPMENT

Growth and development are influenced by many factors throughout life. These factors can have positive or negative impacts on an individual.

FACTOR	POSITIVE IMPACT	NEGATIVE IMPACT
1. PHYSICAL Includes diet and nutrition, exercise, lifestyle choices (alcohol, smoking), genetics, physical and mental health, disability, sensory impairment.	• Good nutrition and regular exercise support healthy growth and strong bodies. • Good health increases energy, independence and life expectancy.	• Poor diet, lack of exercise, smoking or alcohol misuse can cause illness and poor development. • Disability or long-term illness can limit activities and independence.
2. SOCIAL Includes positive and negative relationships, social inclusion/ exclusion, opportunities, discrimination, bullying.	• Supportive relationships build confidence and self-esteem. • Being included and having opportunities helps develop skills and a sense of belonging.	• Bullying, discrimination or rejection can cause low self-esteem, stress and isolation. • Social exclusion can limit choices and opportunities.
3. EMOTIONAL Includes anxiety, fear, sadness/ happiness, grief, attachment, family security.	• Secure attachments and emotional support build confidence and resilience. • Feeling happy and safe improves mental well-being and helps coping skills.	• Anxiety, stress, sadness or grief can affect concentration, behaviour and relationships. • Lack of emotional support can lead to insecurity and mental health problems.
4. ECONOMIC Includes family income, employment, debts, bills, wealth, education, private/ public health providers (services).	• Good income and stable employment provide security and choices. • Access to quality education, healthcare and activities supports growth and future opportunities.	• Low income, unemployment or debt can cause stress and affect well-being. • Limited money can reduce access to education, healthcare and other opportunities.
5. CULTURAL Includes community, religion, race, gender identity, sexual orientation.	• Culture, beliefs and traditions give a sense of identity and belonging. • Community and religion can provide support, values and guidance.	• Discrimination, prejudice or pressure to conform can affect self-esteem and opportunities. • May lead to exclusion or unfair treatment.
6. ENVIRONMENTAL Includes housing needs and conditions, pollution (air, noise, light), neighbourhood, home environment.	• Safe housing, clean air and green spaces promote good physical and mental health. • A safe neighbourhood encourages outdoor play and socialising.	• Poor housing, pollution and noise can cause illness and stress. • Unsafe neighbourhoods can increase fear and limit activities.

KEY POINT: These factors often interact with each other. One factor can influence another, creating either positive or negative effects on growth and development.

A supportive environment in all areas helps individuals reach their full potential at every stage of life.

Quiz maker

Look through the KO for the SOL you're currently studying in your ***OPTION SUBJECT***. Use it to create a quiz (multiple choice) that you can test yourself on towards the end of studying the topic.

1.

A

B

C

D

2.

A

B

C

D

3.

A

B

C

D

4.

A

B

C

D

5.

A

B

C

D

6.

A

B

C

D

Production Processes

Job Production

Advantages	Disadvantages
• Products are usually high quality; • Product can be made to meet the needs of the individual customer; • Workers often get more satisfaction from working on something until it is finished.	• Costs Of production will be high; • Labour costs may be high because job production often require skilled labour.

Each product is made individually to meet the specific needs of the customers.

Batch Production

Advantages	Disadvantages
• The needs of different customers can be met by making batches of different goods; • Batches are made to meet specific orders from customers and this may reduce costs because the goods do not need storing; • It may be possible to use specialist machines and to automate production so that costs are saved.	• It takes time to switch production forma batch of one product to a different batch. Machinery may need to be re-set. This adds to the costs of production and reduces output; • It may be necessary to keep stocks of materials and components to be able to switch production when required. Holding stock is a cash flow problem – the materials have been paid for but revenue is not being earned. There are also storage costs; • There will usually be less choice of products for customers compared with job production; • The tasks may be repetitive and boring for the workers.

Producing one type of product for a time and the changing production to another type of product. E.g. bakery baking one type of bread (white) and then another (wholemeal)

Flow Production

Advantages	Disadvantages
• Large amounts can be made; • The costs of production for each unit made are low because the firm benefits from economies of large-scale production; • Machinery can be used, helping to keep costs low; • Improvements in technology means that not all of the products need to be the same: some variations in design can be programmed into the computer-controlled machines.	• Goods are mass-produced and may not be of good quality, although this is not always true; • It is very expensive to set up a production line; • Large stocks of materials may have to be kept to keep the production line supplied and this may be expensive; • If the production stops at any point on the assembly line (because of a mechanical breakdown or industrial action) there may be a complete shutdown of production; • Jobs on an assembly line can be repetitive and boring.

Good produced on an assembly line – one type of good is produced continually.

Technology in Production Processes

Advantages	Disadvantages
• Costs are reduced as the number of workers required is reduced; • Machines can be more accurate than human workers, improving quality and reducing waste – again helping to cut costs; • Production can be more flexible because the computers can be programmed to produce a variety of products; • The machinery is never absent from work; • Machines can work 24 hours a day, 7 days a week; • Machines can do dangerous and boring jobs that human works may be reluctant or unable to do; • New technology can lead to new products creating demand – think tablet computers and mobile phones.	• Workers may be redundant when the new technology is introduced and this may result in redundancy payments, adding to the short-term costs of the business; • New skilled workers may need to be recruited. Often, the types of workers needed are in high demand and the business may have to pay them big salaries; • Workers may need training to work with the new technology, which adds to the business costs; • Machines can break down and this will disrupt production; • It can be expensive to buy and finance the purchase of technology; • Customers sometimes do not like technology as with automated telephone systems; • Where systems store data about people, there are security issues.

Examples of technology used in production processes = automation and robotics

Knowledge Organiser 6 : Network Security

1. Forms of Attack

Malware	Software written in order to infect computers and commit crimes e.g. fraud or identify theft. Malware exploits vulnerabilities in software
Types of Malware	Malware is term that covers (among other things) viruses, trojans, worms, ransomware, spyware and adware
Phishing	Online fraud technique used by criminals. It is designed to get you to give away personal information such as usernames, passwords, bank details, credit card details… Achieved by disguising as a trustworthy source in an electronic communication, e.g. an email or fake website.
Brute Force Attack	A trial and error method used to decode encrypted data (such as passwords). Uses every combination until it hits upon the correct one.
DOS Attack	Denial of Service attack. Floods a server with useless traffic causing the server to become overloaded and unavailable
DDOS Attack	Distributed Denial of Service Attack. Using multiple computers (zombies) in a Botnet to undertake a DOS attack
Data Interception and Theft	Stealing information from an unknowing victim's computer in order to get confidential information, or to compromise their privacy. E.g. to sniff usernames and passwords
SQL Injection	A technique used to view or change data in a database by inserting additional code into a text input box, creating a different SQL command
Zero Day Attack	An attack using an unknown and undocumented vulnerability in software code (unknown to the code owner)

2. Threats posed to Networks

Malware	• Files are deleted, become corrupt or are encrypted. • Computers crash, reboot spontaneously and slow down. • Internet connections become slow. • Keyboard inputs are logged and sent to hackers.
Phishing	• Accessing a victim's account to withdraw money, or purchase merchandise and services. • Open bank accounts, credit cards, cashing illegitimate cheques. • Gain access to high value corporate data. • Financial services can blacklist the company
Brute Force Attack	• Theft of data. • Access to corporate systems.
(D)DOS Attack	• Loss of access to a service for customers • Lost revenue • Lower productivity • Damage to reputation
Data Interception and Theft	• Usernames and passwords compromised • Disclosure / theft of corporate data
SQL Injection	• Contents of databases can be output, revealing private data. • Data in the database can be amended or deleted. • New rogue records can be added to the database.
People	Many system vulnerabilities are caused by people being careless: • Not installing operating system updates. • Not keeping anti-malware up to date. • Not locking doors to computer rooms. • Not logging off or locking their computer. • Leaving printouts on desks. • Writing passwords down on sticky notes attached to computers. • Sharing passwords. • Losing memory sticks / laptops. • Not applying security to wireless networks. • Not encrypting data.

3. Identifying and Preventing Vulnerabilities

Malware	• Security software (Spam filter, Anti-virus, Anti-spyware, Anti-spam) • Enabling OS and security software updates. • Staff training • Backup files regularly onto removable media.
Phishing	• Strong security software. • Staff training: awareness of spotting fake emails and websites. • Staff training: not disclosing personal or corporate information. • Staff training: disabling browser pop-ups.
Brute Force Attack	• Network lockout policy, Using progressive delays. • Staff training
(D)DOS Attack	• Strong firewall and packet filtering • Properly configuring servers and auditing and monitoring systems
Data Interception and Theft	• Encryption and using virtual networks • Staff training and computer use policies
SQL Injection	• Validation on text boxes • Database permissions

Knowledge Organiser 7 : Systems Software

1. Definitions

Systems Software	Systems Software is the software used to control the hardware of the computer. It is contrasted to application software which is used to enable the user to perform tasks and create content and products
Operating System	An operating system is a piece of system software that communicates with the hardware of the computer and allows other programs to run. It is comprised of system software, or the fundamental files your computer needs to boot up and function
Peripherals	Peripherals are controlled by software called device drivers. Standard drivers (mouse and keyboard) are included in the operating system, however more specialist peripherals may need drivers programmed by the manufacturer which convert signals into machine code and are installed separately
Utility Software	Utilities are programs that are installed to perform a specific function, usually to improve the efficiency or security of a computer system

2. The Function of Operating Systems

What does an Operating system do?	An operating system manages all of the software and hardware on the computer. Most of the time, there are several different computer programs running at the same time, and they all need to access your computer's central processing unit (CPU), memory, and storage. The OS co-ordinates this activity
Interaction	A user interacts with the computer by means of an interface provided by the operating system

3. Types of Interface

GUI	A Graphical User Interface provides windows, icons, menus, (mouse or other) pointer… Sometimes calls WIMP. It is visual, interactive, and intuitive. Optimised for mouse/touch input
CLI	A Command Line Interface is text based. It uses less resources than a GUI. It is more efficient but harder to learn. Often repetitive processes can be automated with scripts
Menu	A Menu Interface presents successive menus to the user with options to choose at each stage. Often used with buttons on a keypad. (Think calculator when you press the 'MENU' button)
Natural Language	A Natural Language Interface responds to questions in a spoken language. They are not always reliable but are improving all the time. (Think Siri or Alexa)

4. Features Often Provided by an Operating System

Multitasking	Running multiple applications at the same time by giving each application a small time-slice of processor time. This allows more than one program to be held in memory at a time, and data shared between them such as copy and paste. It also enables you to listen to music on your PC at the same time as word processing for example
Memory Management	When programs are loaded, the operating system decides where they are held in memory. Over time the memory becomes fragmented as programs are loaded and closed because they use different amounts of memory. The operating system must keep track of different program fragments. When the memory is full, the operating system uses virtual memory
Device Drivers	Translates operating system instructions into commands that the hardware will understand. Each peripheral will need a device driver and many common ones are built into the Operating System
User Management	Providing for different users to log into a computer. The operating system will retain settings for each user, such as icons, desktop backgrounds etc. Each user may have difference access rights to files and programs. A client server network may impose a fixed or roaming profile for a user, and manage login requests to the network.
File Management	Data is stored in files. An extension to the filename tells the operating system which application to load the file into. Files can also be placed in folders for ease of organising

5. Examples of Utility Software

Encryption	Encryption utilities use an algorithm to scramble plain text into cipher text. It can be decrypted and read again with a Key
Defragmentation	Defragmentation utilities reorganise files on a hard disk, putting fragments of files back together, and it collects together free space. This reduces the movement of a read/write head across the surface of the disk, which speeds up file access. Solid state drives should not be defragmented (it is unnecessary as they have no moving parts. It also reduces their lifespan)
Compression	Compression utilities reduce the size of a file so that it takes up less space, and is quicker to download/upload.Compressed files must be extracted before they can be read. Compression is lossy or lossless
Backup	Backup utilities take a copy of the data and place it elsewhere (disks, tapes, cloud, etc.). Backups can be either full (backup everything) or incremental (back up changes since the last backup).

Knowledge Organiser 13 : Producing Robust Programs

1. Input Validation

Validation	Does not ensure that the data entered is correct, just that it is possible and sensible
Type Check	The input is in the correct data type. E.g. Integer, Real, String
Range Check	The input is within a correct range. E.g. Between 1 and 2
Presence Check	Some data has been entered. E.g. Reject blank inputs
Format Check	The input is in the correct format. E.g. dd/mm/yyyy
Length Check	The input has the correct number of characters. E.g. 8 or more chars
Why use input validation?	• The program is more robust • The program is more user friendly • To prevent further errors occurring later in the algorithm

2. Anticipating Misuse

Division by Zero	In mathematics, there is no number which when multiplied by zero returns a non-zero number. Therefore the arithmetic logic unit cannot compute a division by zero.
Communication Error	Online systems require connections to host servers. If this connection is dropped, unable to be established or the server is overloaded, it could potentially cause a program to crash or hang when loading/saving data.
Peripheral Error	Any peripheral may be in an error mode (e.g. paper jam)
Disk Error	Programs that read and write to files must handle exceptions, including: • The file/folder not being found. • The disk being out of space. • The data in the file being corrupt. • The end of the file being reached
Authentication	• Username and password to access systems. • Password recovery by e-mailing to an authenticated e-mail address. • Encryption of data files. • Check for human and not bot attempting access (e.g. reCAPTCHA)

6. Refining Algorithms

What do we mean by refining?	• Code should anticipate all inputs and it should deal with 'bad' data, or missing data, and not crash. • It should ensure prompts to the user are helpful and that the input can only be of the correct type
How to refine	Many languages have exception handling commands

3. Maintainability

Comments	These explain the purpose of the program, or a section of code. They may also explain any unusual approaches or temporary 'fixes'
White Space	Make each section of the code stand out. Use spaces so code is not cramped up and hard to read
Indentation	Mandatory in Python but use indentation to show the flow of the program
Variable Names	Use sensible variable names that have some meaning as to what they are being used for
Sub Programs	Use Procedures and functions to structure the code and eliminate duplicating portions of it
Constants	Declare constants at the top of the program

4. Testing

Reasons for Testing	• To ensure there are no errors (bugs) in the code. • To check that the program has an acceptable performance and usability. • To ensure that unauthorised access is prevented. • To check the program meets the requirements
Iterative Testing	• Each new module is tested as it is written. • Program branches are checked for functionality. • Checking new modules do not introduce new errors I not existing code. • Tests to ensure the program handles erroneous data and exceptional situations.
Final / Terminal Testing	• Testing that all modules work together (integration testing) • Testing the program produces the require results with normal, boundary, invalid and erroneous data. • Checking the program meetings the requirements with real data.

5. Suitable Test Data

Normal Inputs	Data which should be accepted by a program without causing errors
Boundary Inputs	Data of correct type on the edge of accepted validation boundaries
Invalid Inputs	Data of the correct type but outside accepted validation checks
Erroneous Inputs	Data of the incorrect type which should be rejected by a computer system. This includes no input being given when one is expected

Knowledge Organiser 11 : Programming Fundamentals 1

1. Key Terms

Variable	A value stored in memory that can change while the program is running
Constant	A value that does not change while the program is running, and is assigned when the program is designed
Operator	A character that represents an action, e.g. "+" is a mathematical Operator
Assignment	Giving a variable or constant a value
Casting	Converting a variable from one data type to another
Input	A value that is entered into the program after the program has started running
Output	A value that produced by the program and either saved or displayed to the user

2. Correct Use of Data Types

Integer	A positive or negative whole number used when arithmetic will be required
Real / Float	A positive or negative decimal number
Character	A single alphanumeric
String	Multiple characters joined together [n.b. use this for credit card numbers]
Others	Some languages have others, e.g. date, picture…

3. The Three Basic Programming Constructs

Sequence	Executing one instruction after another
Selection	Program branching depending on a condition
Interation	sometimes called looping, is repeating sections of code. Condition controlled or count controlled

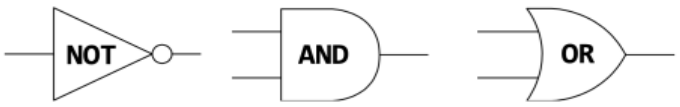
4. Common Arithmetic Operators

+	Addition
-	Subtraction
*	Multiplication
/	Division
^	Exponentiation
MOD	Modulus

5. Common Comparison Operators

==	Is equal to
!=	Is not equal to
<	Is lesser than
>	Is greater than
<=	Is lesser than or equal to
>=	Is greater than or equal to

5. The Common Boolean Operators



6. Basic String Manipulation (general)

string.length	Obtains the length of the string in characters
string.upper	Converts the string to uppercase
string.lower	Converts the string to lowercase
string.left(n)	Gets the left-most n characters of the string
string.right(n)	Gets the right-most n characters of the string
string.substring(a,b)	Gets b characters of the string starting at position a
ASC(char)	Returns the numerical ASCII value of char

Note : this is NOT the way things are done in any particular programming language. In particular Python does things differently

7. Basic File Handling Operations (OCR Reference Language)

myFile=open("…")	Open a file
myFile.close()	Close a file
myFile.readLine()	Read a line from a file
myFile.writeLine()	Write a line to a file
myFile=("…")	Create a new file
string.substring(a,b)	Gets b characters of the string starting at position a
A Workflow	myFile = open ("sample.txt") while NOT myFile.endOfFile() print (myFile.readLine()) endwhile myFile.write("Hello") myFile.close()

Note : this is NOT the way things are done in any particular programming language. In particular Python does things differently

Knowledge Organiser 12 : Programming Fundamentals 2

1. Storing Data in Records

In Text Files	• Stored on the secondary storage (hard disk/SSD/flash). • Used to store data when the application is closed. • Useful for small volumes of data. E.g. configuration files. • Each entry is stored on a new line or separated with an identifier such as a comma or tab. • Can require a linear search to find/read data which is slow (if there is no order to the data or record structure). • Structured text files E.g. CSV, XML & JSON are popular for storing and exchanging data between applications
In Arrays and Lists	• Stored in RAM. • Used to store data when a program is running. • Useful for small volumes of data an algorithm is using. • Can be single or multi-dimensional allowing for tables of data to be stored. • Uses indexes to refer to data items. • Efficient algorithms or linear searches can be used to find data
In Databases	• Often stored on remote servers. • Often used to store data shared by many users, e.g. ticket booking system. • Data is stored in records and fields. • Uses advanced data structures to store data efficiently. • Uses very efficient algorithms to search and sort data executed on the servers. • More secure than text files. • The order of the fields in the database in independent of the code
Record Structure	• A collection of related fields. • A field is a variable. • Each field in a record can have a different data type. • Note the dot syntax when using records: record<dot>Field e.g. car1.Make

2. SQL

SELECT	which fields to be returned. * can be used to indicate all fields
FROM	which table. Databases can have more than one table, each with their own unique name
WHERE	records meet a condition. LIKE and % can be used as a wildcard
Example	SELECT name, age, iq FROM person WHERE name LIKE 'FIS%'

3. Arrays

Definition	An array is a series of memory locations – or 'boxes' – each of which holds a single item of data, but with each box sharing the same name. All data in an array must be of the same data type
Use	• Indexes usually start at 0 for the first data item (known zero indexed). • Arrays may be single or multiple dimensions. • Visualise dimensions as a column (single dimension) or table (two dimension) • In Memory two dimensional arrays are still stored in a linear fashion

4. Sub programs

Why Use them	• Larger programs are developed as a set of sub-programs called subroutines. • Structuring code into sub-programs makes the code easier to read and debug. • Each sub-program can easily be tested. • Sub-programs can be saved into libraries and reused in other programs
Functions	Functions return values and create reusable program components.
Procedures	Procedures create a modular structure to a program making it easier to read. They do not return values

5. Random Numbers

Deterministic	Programs that run on computer systems are deterministic – with exactly the same inputs they should produce exactly the same outputs.
Real World	Randomness is easy to produce in the real world – spinning a wheel, rolling a dice and so on are millennia-old techniques but producing the same randomness in a computer program is actually rather tricky
Computer	• Computers do not produce random numbers at all • They use complex mathematical techniques to produce a series of numbers that may appear random but are really only an approximation to randomness (called pseudo-random numbers) • We refer to them as random numbers anyway
OCR Reference Language	myVariable = random (1,6) will produce a random number between 1 and 6

Key Word	Meaning
Clef	Musical symbols *(including Treble, Bass, Alto, Tenor/C-clefs)* placed at the left-hand side of a musical stave, indicating the pitch of the notes written on it to the performer.
Concert Pitch	Refers to the pitch reference to which a group of musical instruments are tuned for performance. An internationally agreed standard is for the tuning of musical instruments, in which the note A above middle C. has a frequency of 440 Hz.
Descriptive Music	Also called "Programme Music". Descriptive music suggests visual images or "telling a story". The descriptive idea or storyline is known as the "programme". The opposite of descriptive music is "absolute music" which is music that doesn't attempt to describe something particular and is more concerned with form and structure.
Elements of Music	Several different things which have often been called "the building bricks of music" and include: Pitch, Dynamics, Duration, Tempo, Texture, Timbre/Sonority, Attack and Decay and Silence. When a composer creates a piece of music, they use the elements of music to build it, just like a builder uses bricks.
Ensemble	A group of musicians who perform together.

BTEC Music Knowledge Organiser- BTEC

Describe some of the capabilities and limitations of your own instrument voice or technolody in terms of its range and characteristing timbre.

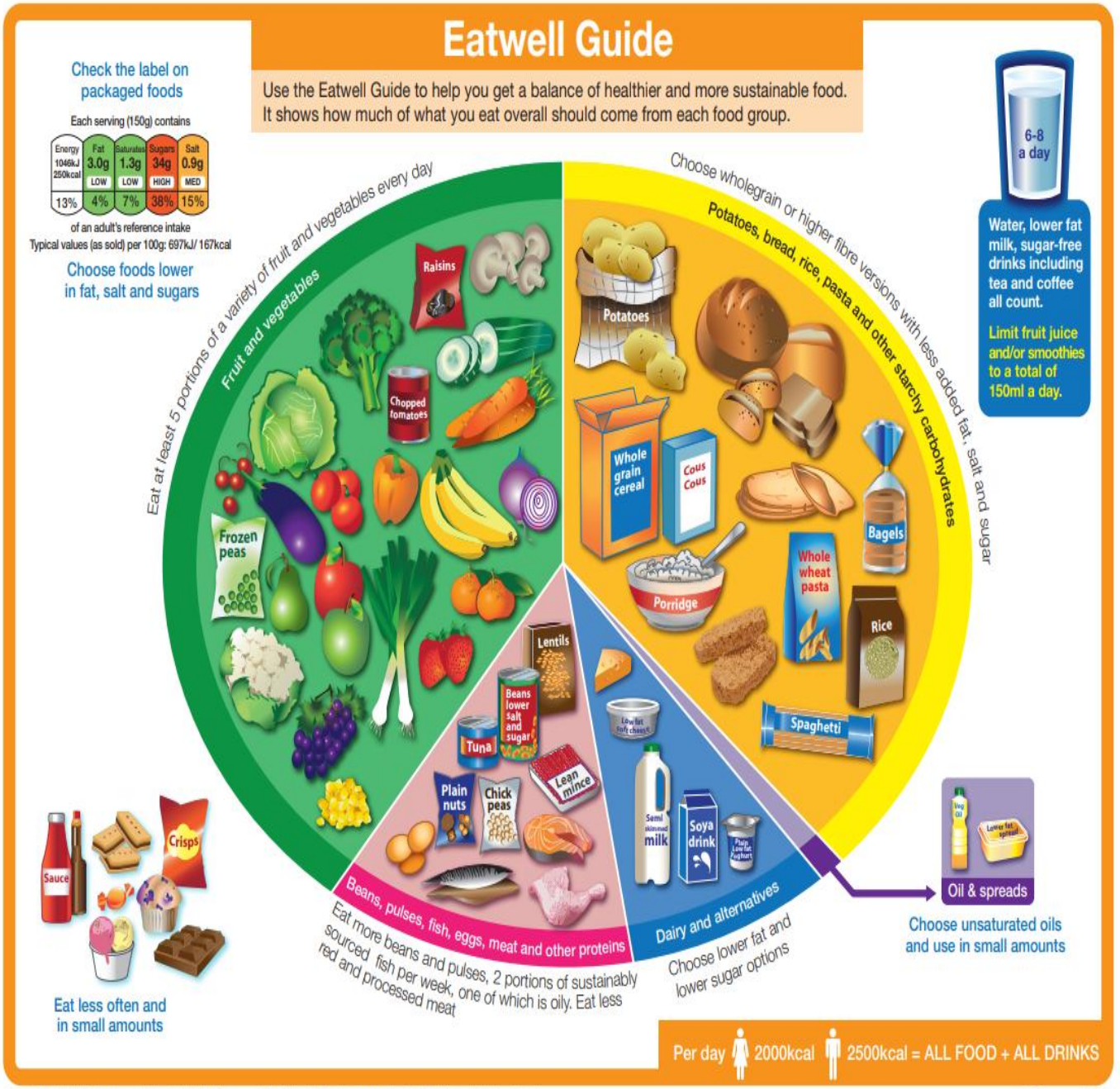
Describe how your own instrument, voice or technology is used in different genres.

Describe what types of ensemble your own instrument, voice or technology might be used in.

Describe how your own instrument, voice or technology's use is influenced by context and culture.

Describe some of the capabilities and limitations of your own instrument voice or technolody in terms of the techniques required to play it and any techniques specific to it.

Task 3: Nutritional needs of a child aged 0-5 years old



The Eatwell Guide shows the proportions of the main food groups that form a healthy, balanced diet:

- Eat at least 5 portions of a variety of fruit and vegetables every day.
- Base meals on potatoes, bread, rice, pasta or other starchy carbohydrates; choosing wholegrain versions where possible.
- Have some dairy or dairy alternatives (such as soya drinks); choosing lower fat and lower sugar options.
- Eat some beans, pulses, fish, eggs, meat and other proteins (including 2 portions of fish every week, one of which should be oily).
- Choose unsaturated oils and spreads and eat in small amounts.
- Drink 6-8 cups/glasses of fluid a day.

If consuming foods and drinks high in fat, salt or sugar have these less often and in small amounts.



British Nutritional guidelines

Did you know that healthy eating habits developed in the early years can set a child up for good health in later life?

Children need a diet made up of foods from the 4 main food groups, in the right balance and in portion sizes just right for them.

Your child will need about this number of portions across the day from each food group:

- 5 -a-day Starchy Foods
- 5 -a-day (or more) Fruit & Vegetables
- 3 -a-day Dairy Foods
- 2 -a-day* Protein Foods

= 5532-a-day

*3 portions if child is vegetarian



If your child is eating well and over 5 years old, then encourage them to eat low-fat dairy products as they contain less saturated fat and can provide the same amount (if not more) calcium.

Have a fruit bowl that is accessible to encourage your child to eat fruit.

Vitamin C aids the absorption of iron from plant sources (see iron).

Offer a variety of different starchy foods – include wholegrain versions and potatoes with their skins on as they contain more fibre.

Your child should eat at least two portions of fish a week, one of which should be oily fish such as salmon, mackerel, trout or sardines. Oily fish contains long chain omega 3 fatty acids which are important for health (see long chain omega 3 fatty acids below).

Too much vitamin A may be harmful. If you think your child needs a supplement, make sure they are age specific and always consult a health professional before you do so.

Too much saturated fat can increase the risk of your child developing serious health conditions in later life such as heart disease. Replace saturated fats in your child's diet with unsaturated fats wherever possible.

British Nutrition Foundation

5532-a-day

Planning Interactive Products

Purpose of a Mood board:

- Used to generate ideas for the look, colour and styles for a project
- Used by the designers of a project

Content of a Mood board:

- Images
- Logos
- Colours
- Text/fonts/styles/keywords
- Textures, fabrics and other materials
- Digital mood board may have sounds and video clips
- Annotations/labels

Purpose of a Mind map:

- Generate ideas quickly
- Develop and show links between different thoughts and ideas

Content of a Mind map:

- Central node with a main theme
- Nodes and sub-nodes
- Interconnecting lines and branches to link ideas together
- Text
- May include images

Purpose of a wireframe diagram:

- Plan the layout of a product to identify the layout and the assets which will be used.

Content of a Visualisation Diagram:

- Image/Movie frames
- Colour/colour schemes
- Text headings, text lines
- Layout/position
- Interactivity
- Annotations and labels providing more details

Adding Interactive Elements

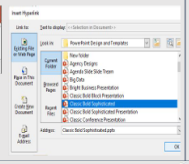
Slide Master: Used to prepare background and font styles.



Transitions | Animations: Used to add visual effects and movement between slides.



Edit | Link: Enables adding hyperlinks for interactivity.

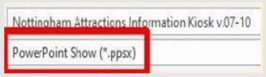


Include video and audio: Supports embedding multimedia elements.

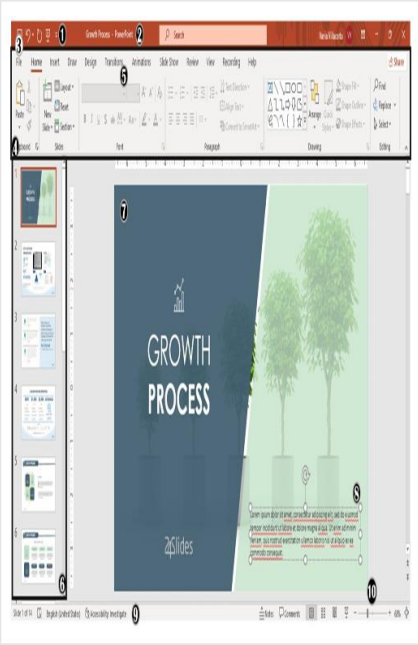


Maintain a consistent theme: Ensures a uniform design throughout with master slides

Export the final product: Allows saving as a suitable file type (e.g., PowerPoint Show *.ppsx).



Microsoft Powerpoint Presentation Features



PowerPoint Main Window

The first aspect to learn is PowerPoint Main Window. To facilitate the explanation, we've organized its main elements with numbers from 1 to 10:

1. **Quick Access Toolbar**: This toolbar allows you to customize commands so that you have them at hand. To do so, you only have to select it and go to "More commands."
2. **Title Bar**: This bar shows the name of your file and other "Suggested options," like Slide Master View. The options you get will vary depending on how you use the commands.
3. **File Tab:** You'll see the Home Menu (PowerPoint backstage) by selecting this tab. There you can create a new presentation, save it, print it, export it, and many other options.
4. **The Ribbon:** It's where PowerPoint tabs and tools are. These tools can also be called "commands" or "features".
5. **More Button or Down Arrow:** These arrows allow you to view more tools or layout options.
6. **Slides Pane:** This pane shows your slides in thumbnail size. Right-clicking each slide allows you to perform more actions. It's perfect for PowerPoint beginners!
7. **Slide:** It's PowerPoint's blank canvas and the frame that will be seen when presenting the file.
8. **Placeholders**: They are the dotted boxes that store your content.
9. **Status Bar:** This bar allows you to view the slide number, grammatical errors, speaker notes, and comments on your file.
10. **Zoom:** It allows you to enlarge or minimize your PowerPoint workspace. The range is 10 to 400%.

Design Principles

Accessibility – Making the product easier use with Language options, colours, fonts, icons



House styles – The common layout, colours and mediums so audience recognise the brand



Graphical User Interface – how the user interacts the visual layout, must make it as easy to use possible.



Websites: available on many platforms. Users can interact with touch screens, computer mice and voice commands.



Information Kiosks: available in real life locations. must be considered so a wide audience can use it.



Mobile Apps: available on smartphones and tablets.Touch screens will also use voice commands.



Adding Interactive Elements

Layout – where multimedia elements are positioned are used seeing familiar layouts of products. For example: logos on websites in the top left that go to the homepage.



Colour scheme – This should suit the purpose for the audience and the product. The house style will often feature a colour scheme. For example: green colours for a natural theme.



E-Learning Apps: available on platforms, so will use the same inputs as websites or mobile apps.



Video games: available on many platforms, some which are designed for them with their own peripheral. GUIs not always similar.



Reviewing Interactive Products

Methods of testing and checking

- Test plan
- Checklist
- Success criteria

Elements of interactive media to test/check

Testing input or behaviours

- to trying to break inputs
- testing by following navigation paths or by deliberately not

Functionality tests

- navigation
- interactivity
- inputs and outputs

Generate ideas quickly

- Develop and show links between different thoughts and ideas

Techniques to review the fitness for purpose of completed interactive digital media

Suitability for client requirements

- suitability of content
- accessibility

Review of audio-visual quality, aesthetics, appeal, interaction, and engagement

Constraints which limit the effectiveness of interactive digital media

Interactive digital media constraints

- Time
- Resources
- Hardware
- Software
- Skills

Interactive digital media improvements

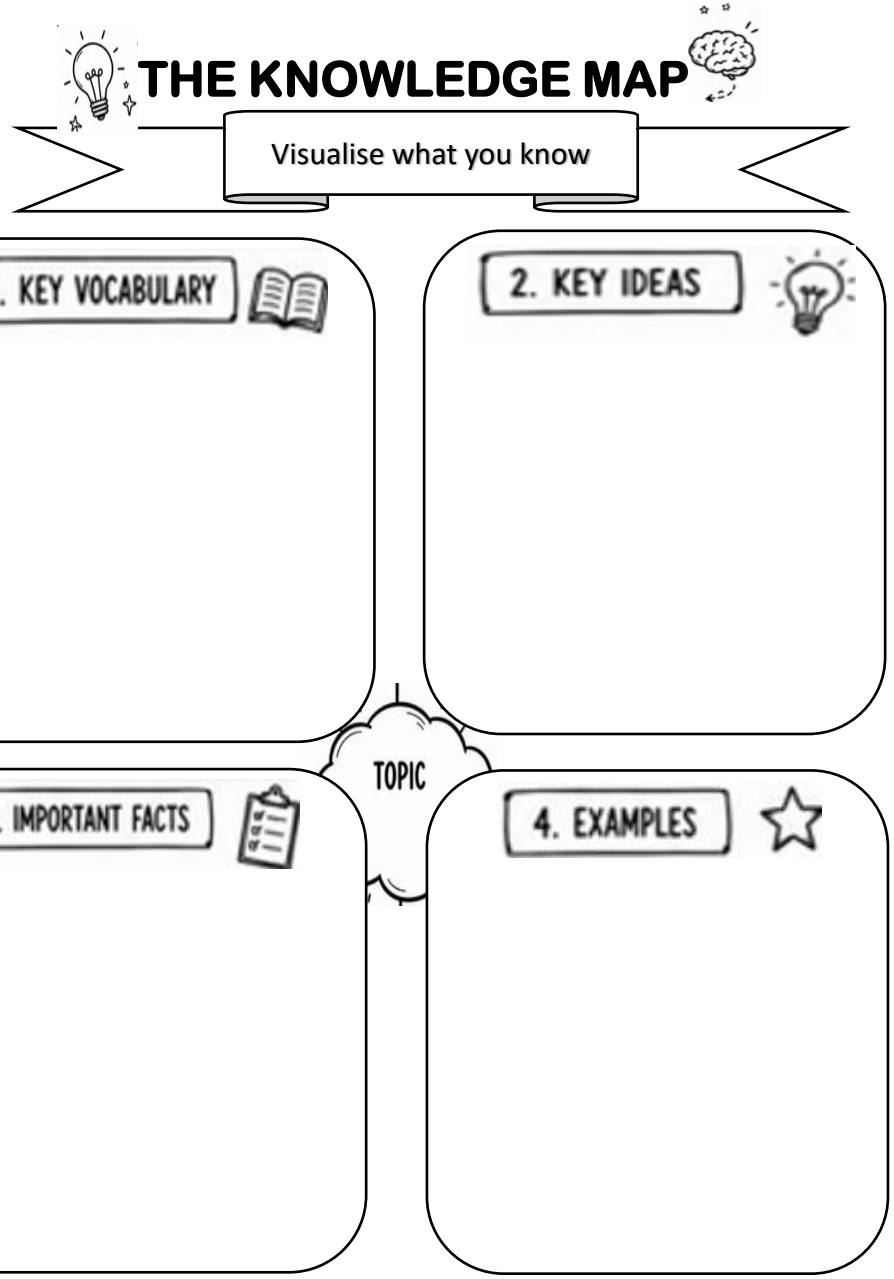
- Overall style and design
- Quality
- Content and concept
- Animation/video
- Audio

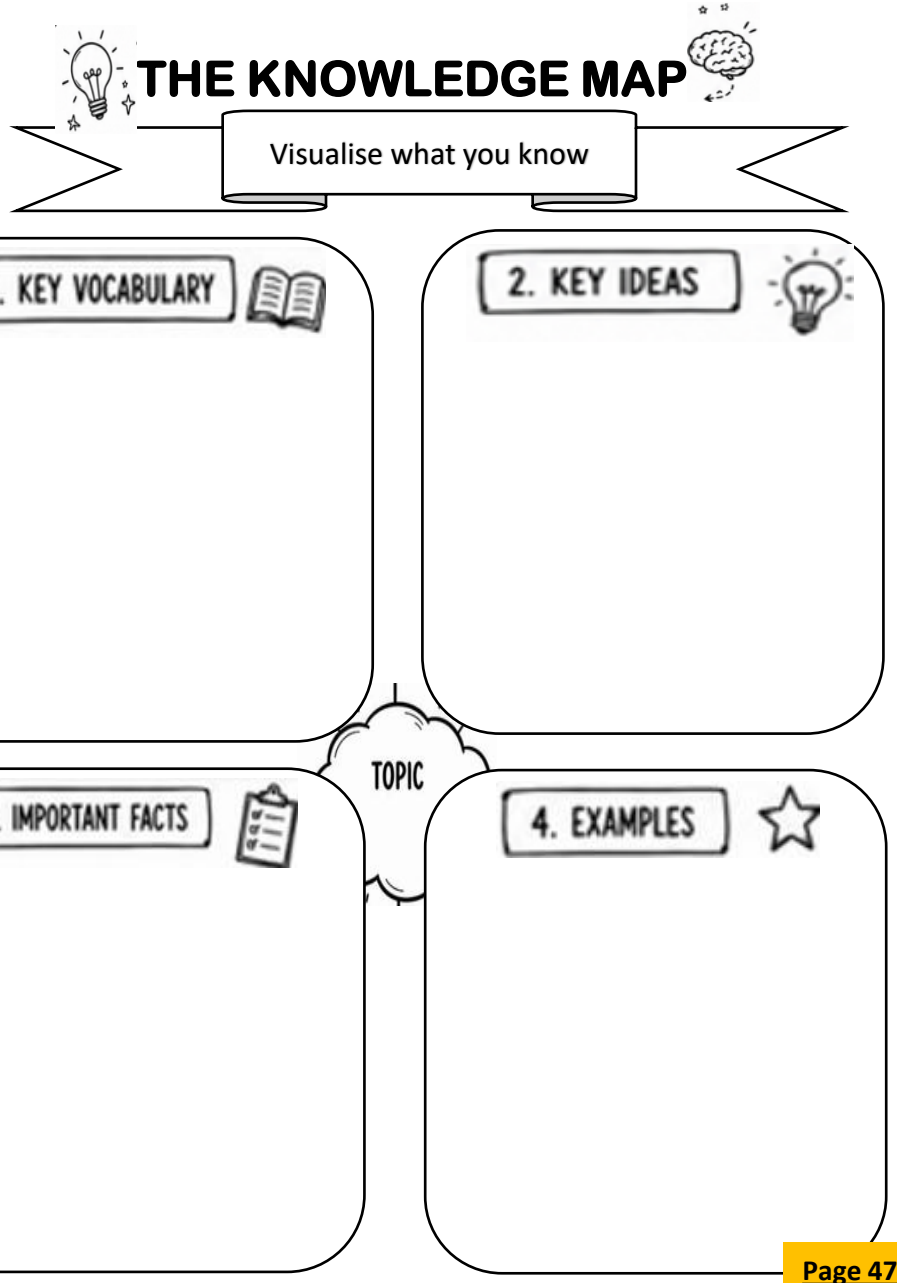
Further development opportunities for digital media

Further developments

- scope
- additional multimedia elements
- more or different interactivity
- altering product type

Have a read through the information on your ***OPTION KO*** 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.