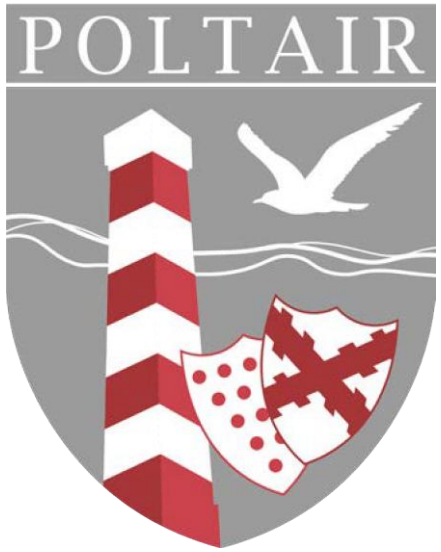

Year 11
Learning Cycle 1

Student Name:_____

Contents

How to Use your Learning Cycle Planner

Poltair School believe that the Learning Cycle Planner should be used daily for classwork and home learning. The Learning Cycle Planner will inform students and parents of topics that are being covered in class during each learning cycle, enabling all students to extend their learning outside of the classroom.

Students should be using their Learning Cycle Planner as a revision guide for assessments and using their SORT strategies to revise for each subject prior to assessments.

Learning Cycle 1
1/9/24 - 20/12/24

Knowledge check
2/12/24 – 13/12/24

At Poltair we SORT it!

How to Use your Learning Cycle Knowledge Organiser

Poltair School believe that the Learning Cycle Knowledge Organiser should be used daily for classwork and home learning. The Learning Cycle Knowledge Organiser will inform students and parents of topics that are being covered in class during each learning cycle, enabling all students to extend their learning outside of the classroom.

Students should be using their Learning Cycle Knowledge Organiser as a revision guide for assessments and using their SORT strategies to revise for each subject prior to assessments.

What are the SORT strategies?

Select	Organise	Recall	Test
Select your revision materials by topic/subtopic. Traffic light your PLC sheets to identify areas of weakness or gaps (Red/Amber) that need to be prioritised.	Organise and condense any class notes, revision guides and revision.	Use active recall and spaced repetition to memorise your knowledge organisers until you can recall the information e.g.. Look, cover, write or self-testing	Use low stakes online tests/quizzes and answer high stakes past paper/sample questions to check and apply knowledge and understanding
Strategies			
• How to use your PLC • How to schedule your home learning and stick to it! • Hoe to select the correct knowledge to study	• Cornell Notes • Flash cards • Mind mapping • Revision clocks • Dual coding • Summary	• Look cover & test • Leitner system • Blurt it • Transform it	• Low stakes • Self-quizzing • Quiz each other • Online quizzes • High stakes • Exam style questions

How to use SORT

Step 1: Select	Step 2: Organise	Step 3: Recall	Step 4: Test
When you revise for a specific topic use your knowledge organiser, revision guide, website etc to select the key knowledge you need to learn. a. Use the daily planner on page 10 to identify all the times when you will complete your home learning and when you will complete independent revision b. RAG each of the PLCs so you identify your RED topics – the ones that you are unsure of or you do not fully understand c. Write your RED topics into your daily planner for when you will revise that subject.	Organise the knowledge that you have selected using a range of strategies: • Flashcards • Mindmaps • Cornell Notes • Revision Clocks • Summary For more details go to the SORT webpage: https://www.poltairschool.co.uk/sort	Once you have summarized the knowledge, you need to actively memorise it. This is the most important part of the revision process! You could use any of the following strategies to help: • Lietner System • Blurt It • Look, say, cover, write, test	The last step in revision is to be confident that you can recall and retrieve the knowledge. To do this you need to test yourself. Quick and simple ways are to ask someone else to quiz you on the knowledge or to complete an online quiz. You can also answer past exam questions. If you can not confidently recall the knowledge you will need to repeat step 3.

At Poltair we SORT it!

ATTENDANCE FOCUS

POLTAIR

ATTENDANCE FOCUS

POLTAIR

Attendance Reflection Sheet	
What is your current attendance?	
How many sessions have you missed of school?	
How many 'I' coded sessions have you had?	
How many 'M' coded sessions have you had?	
How many 'L' coded sessions have you had?	
How many 'U' coded sessions have you had?	
How many 'O' coded sessions have you had?	
How many days does this equate to so far this year?	
If this attendance continued how many days off would you have this year?	

To improve my attendance, I commit to the following:	
1.	
2.	
3.	
What attendance do you want to end this term with?	
What is your end of year attendance target?	
What is our minimum expected attendance to be rewarded?	

Possible strategies to REACH MY attendance Goals

- I will make attending school every day a priority.
- I will keep track of my attendance and absences.
- I will set my alarm clock for _____a.m.
- I will attend school everyday unless I am truly sick.
- I will find a relative, friend or neighbour who can take me to school if I miss the bus.
- If I am absent, I will contact my teachers to find out what I missed.
- I will set up medical and dental appointments for weekdays after school. If I must make a medical appointment during the school day, I will try to attend school for most of the day.
- When I am struggling with a challenge that is keeping me from school I will confide in an adult at school and seek help.

Home Learning timetable - when I am going to complete my home learning

	Mon A	Tues A	Weds A	Thurs A	Fri A	Mon B	Tues B	Weds B	Thurs B	Fri B
11X1 &Y1	Eng/Option C	**Ma/**	Option A	Sci/	Option B/Option D	Ma/Option C	Sci/	Option A	Eng/	Option B/ Option D
11X2 &Y2	Eng/Option C	Ma/	Option A	Sci/	Option B/Option D	Eng/Ma	Sci/	Option A		Option B/Option D
11X3 &Y3	Option C	Eng/	Option A	Ma/Sci	Option B/Option D	Option C	Eng/Ma	Sci/Option A		Option B/Option D

Expected time home learning will take:

Subject	Homework
English	30 minutes (weekly)
Maths	30 minutes (weekly)
Science (Biology, Chemistry & Physics)	30 minutes (weekly)
Option A	30 minutes (weekly)
Option B	30 minutes (weekly)
Option C	30 minutes (weekly)
Option D	30 minutes (weekly)
English	30 minutes (weekly)

My Computer passwords:

Platform	Username	Password

Daily Planner

Time	Monday 2nd September	Tuesday 3rd September	Wednesday 4th September	Thursday 5th September	Friday 6th September	Time	Saturday 7th September	Sunday 8th September
8.30am - 4pm						8.30am - 4pm		
4pm - 5pm						4pm - 5pm		
5pm - 6pm						5pm - 6pm		
6pm - 7pm						6pm - 7pm		
7pm - 8pm						7pm - 8pm		
8pm - 9pm						8pm - 9pm		
Checklist	☐ Home Learning ☐ Revision ☐ #revise50	☐ Home Learning ☐ Revision ☐ #revise50	☐ Home Learning ☐ Revision ☐ #revise50	☐ Home Learning ☐ Revision ☐ #revise50	☐ Home Learning ☐ Revision ☐ #revise50	Checklist	☐ Revision ☐ #revise50	☐ Revision ☐ #revise50
To Do						To Do		

Daily Planner

Time	Monday 9th September	Tuesday 10th September	Wednesday 11th September	Thursday 12th September	Friday 13th September	Time	Saturday 14th September	Sunday 15th September
8.30am - 4pm						8.30am - 4pm		
4pm - 5pm						4pm - 5pm		
5pm - 6pm						5pm - 6pm		
6pm - 7pm						6pm - 7pm		
7pm - 8pm						7pm - 8pm		
8pm - 9pm						8pm - 9pm		
Checklist	☐ Home Learning ☐ Revision ☐ #revise50	☐ Home Learning ☐ Revision ☐ #revise50	☐ Home Learning ☐ Revision ☐ #revise50	☐ Home Learning ☐ Revision ☐ #revise50	☐ Home Learning ☐ Revision ☐ #revise50	Checklist	☐ Revision ☐ #revise50	☐ Revision ☐ #revise50
To Do						To Do		

Daily Planner

Time	Monday 16th September	Tuesday 17th September	Wednesday 18th September	Thursday 19th September	Friday 20th September	Time	Saturday 21st September	Sunday 22nd September
8.30am - 4pm						8.30am - 4pm		
4pm - 5pm						4pm - 5pm		
5pm - 6pm						5pm - 6pm		
6pm - 7pm						6pm - 7pm		
7pm - 8pm						7pm - 8pm		
8pm - 9pm						8pm - 9pm		
Checklist	☐ Home Learning ☐ Revision ☐ #revise50	☐ Home Learning ☐ Revision ☐ #revise50	☐ Home Learning ☐ Revision ☐ #revise50	☐ Home Learning ☐ Revision ☐ #revise50	☐ Home Learning ☐ Revision ☐ #revise50	Checklist	☐ Revision ☐ #revise50	☐ Revision ☐ #revise50
To Do						To Do		

Daily Planner

Time	Monday 23rd September	Tuesday 24th September	Wednesday 25th September	Thursday 26th September	Friday 27th September	Time	Saturday 28th September	Sunday 29th September
8.30am - 4pm						8.30am - 4pm		
4pm - 5pm						4pm - 5pm		
5pm - 6pm						5pm - 6pm		
6pm - 7pm						6pm - 7pm		
7pm - 8pm						7pm - 8pm		
8pm - 9pm						8pm - 9pm		
Checklist	☐ Home Learning ☐ Revision ☐ #revise50	☐ Home Learning ☐ Revision ☐ #revise50	☐ Home Learning ☐ Revision ☐ #revise50	☐ Home Learning ☐ Revision ☐ #revise50	☐ Home Learning ☐ Revision ☐ #revise50	Checklist	☐ Revision ☐ #revise50	☐ Revision ☐ #revise50
To Do						To Do		

Daily Planner

Time	Monday 30th September	Tuesday 1st October	Wednesday 2nd October	Thursday 3rd October	Friday 4th October	Time	Saturday 5th October	Sunday 6th October
8.30am - 4pm						8.30am - 4pm		
4pm - 5pm						4pm - 5pm		
5pm - 6pm						5pm - 6pm		
6pm - 7pm						6pm - 7pm		
7pm - 8pm						7pm - 8pm		
8pm - 9pm						8pm - 9pm		
Checklist	☐ Home Learning ☐ Revision ☐ #revise50	☐ Home Learning ☐ Revision ☐ #revise50	☐ Home Learning ☐ Revision ☐ #revise50	☐ Home Learning ☐ Revision ☐ #revise50	☐ Home Learning ☐ Revision ☐ #revise50	Checklist	☐ Revision ☐ #revise50	☐ Revision ☐ #revise50
To Do						To Do		

Daily Planner

Time	Monday 7th October	Tuesday 8th October	Wednesday 9th October	Thursday 10th October	Friday 11th October	Time	Saturday 12th October	Sunday 14th October
8.30am - 4pm						8.30am - 4pm		
4pm - 5pm						4pm - 5pm		
5pm - 6pm						5pm - 6pm		
6pm - 7pm						6pm - 7pm		
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8pm - 9pm						8pm - 9pm		
Checklist	☐ Home Learning ☐ Revision ☐ #revise50	☐ Home Learning ☐ Revision ☐ #revise50	☐ Home Learning ☐ Revision ☐ #revise50	☐ Home Learning ☐ Revision ☐ #revise50	☐ Home Learning ☐ Revision ☐ #revise50	Checklist	☐ Revision ☐ #revise50	☐ Revision ☐ #revise50
To Do						To Do		

Daily Planner

Time	Monday 14th October	Tuesday 15th October	Wednesday 16th October	Thursday 17th October	Friday 18th October	Time	Saturday 19th October	Sunday 20th October
8.30am - 4pm						8.30am - 4pm		
4pm - 5pm						4pm - 5pm		
5pm - 6pm						5pm - 6pm		
6pm - 7pm						6pm - 7pm		
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8pm - 9pm						8pm - 9pm		
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To Do						To Do		

Daily Planner

Time	Monday 21st October	Tuesday 22nd October	Wednesday 23rd October	Thursday 24th October	Friday 25th October	Time	Saturday 26th October	Sunday 27th October
8.30am - 4pm						8.30am - 4pm		
4pm - 5pm						4pm - 5pm		
5pm - 6pm						5pm - 6pm		
6pm - 7pm						6pm - 7pm		
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8pm - 9pm						8pm - 9pm		
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To Do						To Do		

Daily Planner

Time	Monday 28th October	Tuesday 29th October	Wednesday 30th October	Thursday 31st October	Friday 1st November	Time	Saturday 2nd November	Sunday 3rd November
8.30am - 4pm						8.30am - 4pm		
4pm - 5pm						4pm - 5pm		
5pm - 6pm						5pm - 6pm		
6pm - 7pm						6pm - 7pm		
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8pm - 9pm						8pm - 9pm		
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To Do						To Do		

Daily Planner

Time	Monday 4th November	Tuesday 5th November	Wednesday 6th November	Thursday 7th November	Friday 8th November	Time	Saturday 9th November	Sunday 10th November
8.30am - 4pm						8.30am - 4pm		
4pm - 5pm						4pm - 5pm		
5pm - 6pm						5pm - 6pm		
6pm - 7pm						6pm - 7pm		
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8pm - 9pm						8pm - 9pm		
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To Do						To Do		

Daily Planner

Time	Monday 11th November	Tuesday 12th November	Wednesday 13th November	Thursday 14th November	Friday 15th November	Time	Saturday 16th November	Sunday 17th November
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To Do						To Do		

Daily Planner

Time	Monday 18th November	Tuesday 19th November	Wednesday 20th November	Thursday 21st November	Friday 22nd November	Time	Saturday 23rd November	Sunday 24th November
8.30am - 4pm						8.30am - 4pm		
4pm - 5pm						4pm - 5pm		
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To Do						To Do		

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Time	Monday 25th November	Tuesday 26th November	Wednesday 27th November	Thursday 28st November	Friday 29th November	Time	Saturday 30th November	Sunday 31st November
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To Do						To Do		

Well done! You have completed your PPEs!! Enjoy a well-deserved restful weekend 😊

Personal Learning Checklists

English – Literature Paper 1, Section A (Macbeth)

Key Ideas	S	O	R	T
Recalling significant moments in the plot.				
Understanding characters and how they develop throughout the play.				
Understanding key themes (the supernatural, violence, appearance and reality, good vs. evil, guilt, kingship).				
Identifying and analysing language methods.				
Identifying and analysing structure.				
Identifying and analysing features of the play form.				
Recalling key quotations for all characters and themes.				
Understanding how Shakespeare's beliefs and motivations influence his writing.				
Understanding Shakespeare's intentions and messages.				
Recalling key information about the Jacobean context.				
Planning thoughtfully sequenced responses to exam questions.				
Writing thesis introductions.				
Developed what, how, why paragraphs.				
Using a range of references (including quotations) to support ideas.				
Using appropriate connectives.				
Developing analysis with relevant contextual ideas.				
Using a range of sophisticated vocabulary to enhance analysis.				

English – Literature Paper 1 Section B (A Christmas Carol)

Key Ideas	S	O	R	T
Recalling significant moments in the plot.				
Understanding characters and how they develop throughout the novella.				
Understanding key themes (greed, poverty, familial love, redemption, Christmas, charity, happiness and joy).				
Identifying and analysing language methods.				
Identifying and analysing structure.				
Recalling key quotations for all characters and themes.				
Understanding how Dickens' beliefs and motivations influence his writing.				
Understanding Dickens' intentions and messages.				
Recalling key information about the Victorian context.				
Planning thoughtfully sequenced responses to exam questions.				
Writing thesis introductions.				
Developed what, how, why paragraphs.				
Using a range of references (including quotations) to support ideas.				
Using appropriate connectives.				
Developing analysis with relevant contextual ideas.				
Using a range of sophisticated vocabulary to enhance analysis.				

Personal Learning Checklists

English – Language Paper 1

Key Ideas	S	O	R	T
Question 1: focus, timings and how to answer the question.				
Question 2: focus, timings and how to answer the question.				
Question 3: focus, timings and how to answer the question.				
Question 4: focus, timings and how to answer the question.				
Selecting relevant information from a fiction text.				
Identifying language methods with accurate terminology.				
Analysing language methods.				
Identifying structure methods with accurate terminology.				
Analysing structure methods.				
Evaluating a statement about a fiction text.				
Supporting my evaluation of a fiction text by identifying and analysing a range of relevant methods.				
Planning an extended descriptive or narrative piece of writing.				
Using a range of sophisticated vocabulary precisely in my creative writing.				
Using a range of language methods in my creative writing.				
Using a range of punctuation accurately in my creative writing.				
Using a range of sentence structures and starters in my creative writing.				
Proof-reading and editing my creative writing.				

Personal Learning Checklists

English - Literature Paper 2 Section C (Unseen Poetry)

Key Ideas	S	O	R	T
Part 1 - Analysis				
Understanding key ideas and meanings				
Appreciating poet's purpose and messages				
Identifying and analysing language methods				
Identifying and analysing structure methods and features of form				
Planning my response effectively				
Using key quotations and references to support ideas				
Using appropriate connectives				
Writing a thesis introduction				
Writing developed what, how, why paragraphs				
Part 2 - Comparison				
Identifying important methods accurately				
Making thoughtful comparisons between the methods used by both poets				
Using key quotations and references to support ideas				
Using appropriate connectives				
Analysing chosen methods in detail				

Science

Key Ideas	S	O	R	T
I can describe the pathway of a reflex arc				
I can explain how the structure of the nervous system is adapted for its functions				
I can plan and carry out an investigation into the effect of a factor on human reaction time				
I can identify the position of glands and organs in the human body				
I can explain the control of blood glucose concentration				
I can compare type 1 and type 2 diabetes				
I can describe the roles of hormones in human reproduction, including the menstrual cycle				
I can evaluate the different hormonal and non-hormonal methods of contraception				
I can explain the use of hormones in reproductive technologies to treat infertility (HT only)				
I can explain the roles of thyroxine and adrenaline in the body (HT only)				

Science

Key Ideas	S	O	R	T
I can identify scalars and vectors				
I can recall and apply the equations for weight and work done.				
I can explain Newton's 1st, 2nd and 3rd law and apply to given examples.				
I can recall and apply the equation for Hooke's Law and investigate the relationship between force and extension for a spring				
I can recall typical values for speed.				
I can recall and apply the speed equation.				
I can determine speed from a d-t graph				
I can draw and interpret velocity-time graphs				
I can recall and apply equations for acceleration.				
I can explain the factors that affect braking distance.				
I can use the concept of momentum as a model to describe and explain examples of momentum in an event, such as a collision as well as recall and apply the equation p=mv				

Personal Learning Checklists

Science

Key Ideas	S	O	R	T
I can describe the attraction and repulsion between unlike poles for permanent magnets				
I can describe the difference between permanent and induced magnets				
I can describe how to plot the magnetic field pattern of a magnet using a compass				
I can describe how to plot the magnetic field pattern of a magnet using a compass				
I can describe how the magnetic effect of a current can be demonstrated				
I can draw the magnetic field pattern for a straight wire carrying a current and for a solenoid				
I can show how Fleming's Left Hand Rule represents the relative orientation of the force, the current in the conductor and the magnetic field (HT only)				
I can apply and use F=Bil equation (HT only)				
I can explain how the force on a conductor in a magnetic field causes the rotation of the coil in an electric motor (HT only)				

Art

Key Ideas	S	O	R	T
Explain and use tone, texture, line, shape, scale and composition to create an interesting observational drawing.				
Experiment with a range of materials.				
Refine work through annotation.				
Record ideas and observations.				
Develop ideas through investigation.				
Present a personal and meaningful response.				
Explain and discuss how decisions have been made through annotation.				

Computer Science

Key Ideas	S	O	R	T
I know how to open, close, append and create files in Python				
I can explain and identify Syntax and Logic errors in code				
I know the different types of test data, how to design a test and how to record output in a test table.				
Know the difference between Iterative and terminal testing				
I can demonstrate the different Search algorithms and can choose for a task				
I can demonstrate the different Sort algorithms and can choose for a task				
I can perform SQL queries on tables of data				
I can write code which uses selection				
I can write code which uses iteration				
I can implement subroutines and know the benefits of using them				
I can discuss the Cultural, Legal, Environmental and Ethical issues in technology development				
I can create and use 1D and 2D Arrays for problem solving				
I can identify methods to make code more maintainable				

Personal Learning Checklists

Design Technology

Key Ideas	S	O	R	T
I am able to use ACCESSFM to identify the target areas of products.				
I can model and develop an idea based on a concept.				
I can use my knowledge of previous products to come up with a solution to a problem.				
I am able to think outside the box and be creative with my solutions.				
I can think logically and organise my ideas in my portfolio.				

Engineering

Key Ideas	S	O	R	T
I am able to identify risk when using machines, and can create risk assessments to highlight where mitigations are in place.				
I am able to create and use a GANTT chart in order to create a logical plan to create a product.				
I am able to use the centre lathe to engineer different metal components.				
I am able to use the milling machine to engineer different metal components.				
I am able to use hand tools to engineer different metal components.				
I am able to quality assure my product by looking at accuracy, measurements and finish of a product.				

Geography

Key Ideas	S	O	R	T
Define development				
Name economic development indicators				
Explain the benefits of socio-economic indicators, e.g.; HDI				
Explain the stages in the demographic transition model				
Locate and describe the tropical rainforest biome				
Describe and evaluate strategies to reduce the development gap				
Describe the location of Nigeria in Africa				
Explain the reasons for rapid economic growth				
Explain the advantages and disadvantages of TNCs in Nigeria				
Explain the environmental consequences of rapid industrialisation in Nigeria				

Personal Learning Checklists

Geography

Key Ideas	S	O	R	T
Define key terms				
Describe the causes of economic change				
Define post-industrial				
Explain the effects of post-industrial change in the UK				
Explain the reasons for the development of the quaternary sector in the UK				
Describe the differences between a business and science park				
Explain the impacts of rural depopulation				
Explain the impacts of rural population growth				
Explain transport developments in the UK				
Evaluate strategies to reduce the north-south divide				
Define key terms				

History

Key Ideas	S	O	R	T
How the role of the Church changed over time				
The impact of the Printing Press on medical understanding and knowledge				
The developing role of science and scientific understanding				
The importance of individuals in scientific discovery				
Changing attitudes to medicine in society				
The impact of war on medical understanding				
The developing role of technology in 20th Century medicine				

Hospitality & Catering

Key Ideas	S	O	R	T
I can describe functions of nutrients in the body (U2, LO1, AC1.1)				
I can compare nutritional needs of specific groups (U2, LO1, AC1.2)				
I can explain characteristics of unsatisfactory nutritional intake (U2, LO1, AC1.3)				
I can explain how nutritional methods impact on nutritional value (U2, LO1, AC1.4)				
I can explain factors to consider when proposing dishes for menus (U2, LO2, AC2.1)				
I can explain dishes on a menu address environmental issues (U2, LO2, AC2.2)				
I can explain how men dishes meet customer needs (U2, LO2, AC2.3)				
I can use techniques in preparation of commodities (U2, LO3, AC3.1)				
I can assure quality of commodities to be used in food preparation (U2, LO3, AC 3.2)				
I can use techniques in cooking of commodities (U2, LO3, AC3.3)				
I can complete dishes using presentation techniques (U2,LO3AC3.4)				
I can use food safety practices(U2, LO3, AC3.5)				

Personal Learning Checklists

Performing Arts

Key Ideas	S	O	R	T
I am able to use diction and projection effectively.				
I can use emphasis, volume and pitch effectively.				
I have thought about how my accent, rhythm, tempo and tone of my voice is used.				
I have thought about how my accent, rhythm, tempo and tone of my voice is used.				
I have thought about how my accent, rhythm, tempo and tone of my voice is used.				
I have thought about stagecraft skills such as blocking, entrances and exits, proxemics, use of space, levels, audience awareness, sets and props, and energy.				

Religious studies

Key Ideas	S	O	R	T
I can outline different religious teachings about the universe and stewardship				
I can outline different religious teachings about the origins and sanctity of life				
I can compare Christian and Muslim views and teachings about Abortion				
I can compare Christian and Muslim views and teachings about Euthanasia				
I can compare Christian and Muslim views and teachings about Animal Experimentation				
I can consider different perspectives on protests and protest methods				
I can outline how some Christians disagree about issues linked to peace and justice				
I can outline and explain the Just War and Holy War theory				

Spanish

Key Ideas	S	O	R	T
I know my non-negotiable verbs for the past, present and future tenses				
I know at least 5 interesting adjectives that I can apply to my work				
In the writing exam, I understand the format that each of the tasks takes				
I can write the success criteria for these tasks from memory				
In the Speaking exam, I understand the format of each of the three tasks				
I feel confident with the key vocab for the role-play				
I regularly learn the key vocab for the reading and listening exams				

English - Macbeth

1. Plot

1a

Act 1, Scene 1: Three witches gathering amidst thunder and lightning. They plan to meet with Macbeth.

Act 1, Scene 2: A captain tells the king that Macbeth and Banquo fought bravely against the rebel forces led by Macdonald. Ross arrives from Fife with further news of victory. The Norwegian king is pleading for peace and the rebellious Thane of Cawdor has been captured. Duncan decides to give the title of Thane of Cawdor to Macbeth.

Act 1, Scene 3: The witches meet and plot to ruin a sailor's life. Macbeth and Banquo meet the witches. They hail Macbeth by his title Thane of Glamis, as Thane of Cawdor and as King. They also predict that Banquo's children will be kings. Ross and Angus arrive, telling Macbeth that he has been given the title Thane of Cawdor.

Act 1 Scene 4: Duncan thanks Macbeth and Banquo for their part in the battle and announces that his eldest son, Malcolm, will inherit the throne from him when he dies. Duncan says they will visit Macbeth's castle and Macbeth goes on ahead to tell Lady Macbeth.

Act 1 Scene 5: Lady Macbeth reads a letter from her husband the witches' prophecies. She fears that her husband is too kind to achieve the position of King by committing regicide. She calls on the spirits to 'unsex' her and make her strong and remorseless. Macbeth arrives Lady Macbeth advises him to hide his malicious intentions from their guests.

Act 1 Scene 6: Duncan and the thanes arrive at Dunsinane Castle, welcomed by Lady Macbeth.

Act 1 Scene 7: Macbeth struggles with his conscience and decides against the regicide. Lady Macbeth chastises and emasculates him. He changes his mind and is settled upon the murder.

1b

Act 2, Scene 1: In the middle of the night, Banquo and his son Fleance meet Macbeth. Banquo tells him that he dreamed of the witches, but Macbeth lies and says he has not thought about them. As he goes towards Duncan's chambers, Macbeth sees a vision of a bloody dagger.

Act 2, Scene 2: Macbeth returns after committing regicide. He is guilty and anxious. Lady Macbeth dismisses his fears. Seeing that he has brought the guards' daggers with him, she returns them to Duncan's rooms. Someone knocks on the door of the castle. Lady Macbeth returns with bloody hands and reassures Macbeth that water will erase any memory of the murder.

Act 2, Scene 3: The Porter answers the door of the castle to Macduff and Lennox. Macduff uncovers the murder. Macbeth kills the guards. Malcolm flees to England and Donalbain to Ireland.

Act 2, Scene 4: Ross talks about a series of unusual things in nature that have that have occurred. Ross reports that Macbeth has been named king. Macduff heads home to Fife.

1c

Act 3, Scene 1: Banquo suspects Macbeth of acting immorally. Lady Macbeth and Macbeth invite Banquo to a banquet. Macbeth then talks about his fears that Banquo's children will become future kings. He convinces two murderers to kill Banquo and his son Fleance.

Act 3, Scene 2: Lady Macbeth urges Macbeth not to think on past deeds but he is plagued by fears about potential threats. He will not tell her what he has done to Banquo.

Act 3, Scene 3: The murderers attack and kill Banquo but Fleance escapes.

Act 3, Scene 4: As the banquet begins, the ghost of Banquo sits in Macbeth's place at the table and Macbeth is visibly shaken. Lady Macbeth calms the guests by saying that it is a momentary fit. Lady Macbeth criticises Macbeth for his irrational behaviour. The ghost reappears. Lady Macbeth tells the guests to leave. Macbeth decides that he will visit the witches again.

Act 3, Scene 5: Hecate is angry with the witches for giving prophecies to Macbeth without consulting her.

Act 3, Scene 6: Lennox is suspicious about the murders of Duncan and Banquo. A lord recounts how Macduff has gone to England to seek help in overthrowing Macbeth.

1d

Act 4, Scene 1: Macbeth visits the witches and is shown three apparitions: an armed head saying 'beware Macduff'; a bloody child appears, saying 'none of woman born shall harm Macbeth' and a crowned child saying that he will never be defeated 'until Great Birnam Wood to high Dunsinane hill shall come against him'. He is also shown an apparition of eight kings following Banquo's ghost. Macbeth is terrified and angry. Lennox arrives with word that Macduff has fled to England. Privately, Macbeth vows to kill all of Macduff's family.

Act 4, Scene 2: Lady Macduff worries about why her husband has fled but Ross reassures her that Macduff is wise. Murderers arrive and kill Macduff's son and wife.

Act 4, Scene 3: In England, Macduff tells Malcolm of how Scotland is suffering under the tyrannical Macbeth. Malcolm is suspicious of Macduff and tests his loyalty. Malcolm is satisfied and tells Macduff that he is ready - with Old Siward and 10,000 men - to invade Scotland. Ross arrives to tell Macduff about the death of his wife and children. Malcolm comforts Macduff.

English - Macbeth

1. Plot

1e

Act 5, Scene 1: A doctor and a gentlewoman watch Lady Macbeth sleepwalk. She speaks in her sleep and tries to wash her hands, believing they are covered in blood.

Act 5, Scene 2: The English forces advance, led by Malcolm, Siward and Macduff. Macbeth is in Dunsinane but his men are rising up against him.

Act 5, Scene 3: Macbeth angrily dismisses those who bring him reports of attack. He calls for his armour to be brought to him. The doctor tells Macbeth that he cannot help Lady Macbeth.

Act 5, Scene 4: The Scottish lords gather with Malcolm, Macduff and their army. They cut down boughs of the trees in Birnam Wood to use as camouflage.

Act 5, Scene 5: Macbeth continues to stand his ground against the siege. Seyton reports that Lady Macbeth is dead. Macbeth reflects on the pointless nature of life. A messenger informs Macbeth that he has seen Birnam Wood moving towards Dunsinane hill. Macbeth is unnerved that the prophecy has come true but vows he will die fighting.

Act 5, Scene 6: Malcolm's army arrive at the castle. They throw down their camouflaging branches to reveal themselves. Malcolm talks through the battle plan.

Act 5, Scene 7: Macbeth declares that he will fight, but remains reassured by the prophecy that he cannot be defeated by anyone born of a woman. Macbeth kills Young Siward. Macduff enters the castle, seeking vengeance on Macbeth. Malcolm and Siward enter the castle.

Act 5, Scene 8: Macduff confronts Macbeth and they fight. Macduff reveals that he was born via caesarean. Macduff kills Macbeth.

Act 5, Scene 9: Macduff arrives with Macbeth's severed head. He hails Malcolm the new King of Scotland. Malcolm honours those who have fought alongside him and invites them to see him crowned.

2. Context

2a = Shakespeare's Time: William Shakespeare wrote 'Macbeth' during the Jacobean era, under the reign of King James I. This period saw political unrest and a significant event highlighting this instability was the Gunpowder Plot of 1605, an attempt to assassinate the king and blow up the Parliament.

2b = James I: King James I held a fervent belief in the existence and evil of witchcraft. His fear of witches and their supposed conspiracy against him led to a series of witch trials. James was convinced that witches, in league with the Devil, were plotting his demise. He even wrote a treatise on the subject, entitled 'Daemonologie,' which explored and endorsed the persecution of those accused of witchcraft.

2a = Witches and the Supernatural: At the time that Shakespeare was writing Macbeth, the belief in witches and the supernatural was deeply ingrained. People believed that witches could ruin crops, cause devastating storms and kill babies. Many so called 'witches' were burnt at the stake. There is no doubt that some of the ideas in the play would have been taken very seriously, such as the witches' prophecies, Macbeth being seemingly 'possessed' and his vivid hallucinations.

2d = Women: Jacobean society, under the rule of King James I, was inherently patriarchal. Women had limited rights and were expected to be subservient to their husbands. Lady Macbeth appears to defy traditional gender roles and exerts a significant influence over her husband.

2e = The Great Chain of Being: As imagined during the Jacobean era, this idea placed everything in a hierarchical order, from God and angels at the top, to the monarch, humans, animals, plants, and inanimate objects. Any disruption to this divine hierarchy, such as regicide was believed to result in chaos and disorder. In 'Macbeth,' the usurpation of King Duncan disrupts the natural order, leading to turmoil and catastrophe.

2f = The Divine Right of Kings: A rule that asserted that monarchs were chosen by God and therefore held absolute power and authority. Any act against the king was considered an act against God's will. In 'Macbeth,' the murder of Duncan is a profound violation of the divine order.

English - Macbeth

3. Characters – Summaries

3a = Macbeth

Macbeth is introduced as a heroic warrior. Despite his fearlessness in battle, Macbeth is enthralled by the Witches' prophecies, exposing his dark ambition. Emasculated by his wife, Lady Macbeth, he commits regicide. Consequently, he is tormented by guilt. His ambition spurs him toward further terrible deeds and he eventually acts independently of his wife. Concerned that his own descendants will not be Kings, he arranges for Banquo to be murdered but is haunted by his ghost. He returns to the witches, whose equivocal advice leads to Macbeth feeling unbeatable. Macbeth's hubris is now his dominant character trait and eventually he is killed by Macduff.

3b = Lady Macbeth

Macbeth's wife is one of the most powerful female characters in literature. She longs to rid herself of compassion and humanity, calling on spirits to remove her feminine instincts. She taunts Macbeth for his lack of courage but in public she acts gracefully. Ultimately, she is greatly affected by her own hardened ruthlessness. Macbeth begins to act independently and she becomes mentally unstable, a mere shadow of her former commanding self, sleep-walking and sleep-talking before dying.

3c = The Witches

The witches are supernatural beings who embody chaos and malevolence, influencing events with their prophecies. They inspire Macbeth's dark ambition by predicting his rise to power, setting him on a path of murder and tyranny. They use equivocal language to deceive leading to Macbeth's downfall.

3d = King Duncan

Duncan is the supreme example of a graceful, orderly and honourable king. Duncan also expresses humility when he admits his misplaced trust in the treacherous previous Thane of Cawdor. Duncan is depicted as the representative of God on earth, ruling by divine right (ordained by God), a feature of kingship strongly endorsed by King James I, and his death leads to a disruption in order in nature and the wider world. His benevolent reign contrasts the tyranny of Macbeth's rule.

3e = Banquo

Like Macbeth, Banquo is presented as a courageous and loyal warrior at the start of the play. He is depicted as open to human desires but able to think rationally, following the witches' opening prophecies. He is told that his descendants will be kings but he is able to balance his ambition with his moral compass, showing restraint and caution. Macbeth sees him as a threat to his own power and orders his murder. Fleance, his son, escapes. His ghost returns to haunt Macbeth.

3f = Macduff

Macduff is portrayed as a loyal and principled nobleman, acting in an honourable and just way. He is appalled to discover the body of Duncan. Driven by a profound sense of duty to his country, he leaves his family to visit Malcolm in England, to plead with him to save Scotland from Macbeth's tyranny. He is deeply affected by the murder of his family, which intensifies his resolve to overthrow Macbeth. Macduff embodies justice, playing a crucial role in Macbeth's downfall by killing him in the final act.

4. Characters – Vocabulary

4a = Macbeth

- ✓ Ruthless: Having no compassion for others.
- ✓ Tyrannical: Cruel and oppressive in ruling over others.
- ✓ Hubristic: Excessively proud and self-confident.

4b = Lady Macbeth

- ✓ Manipulative: Skilled at influencing or controlling others.
- ✓ Calculating: Planning things carefully and intentionally.
- ✓ Tormented: Suffering from severe mental or emotional pain.

4c = The Witches

- ✓ Malevolent: Wishing harm or evil on others.
- ✓ Prophetic: Predicting what will happen in the future.
- ✓ Deceptive: Giving an appearance or impression different from the truth.

4d = King Duncan

- ✓ Benevolent: Kind and well-meaning.
- ✓ Gracious: Courteous, kind, and pleasant.
- ✓ Venerable: Given a great deal of respect.

4e = Banquo

- ✓ Honourable: Deserving respect and high regard.
- ✓ Loyal: Faithful to someone or something.
- ✓ Prudent: Acting with or showing care and thought for the future.

4f = Macduff

- ✓ Righteous: Morally right or justifiable.
- ✓ Vengeful: Seeking to harm someone in return for a perceived injury.
- ✓ Resolute: Admirably purposeful, determined, and unwavering.

5. Tragic hero

First explained by Aristotle, a tragic hero is a character who begins in a high position, often of noble birth, but makes a mistake that leads to their downfall. A tragic hero's story is meant to evoke feelings of pity and fear in the audience.

Characteristics of a Tragic Hero:

- Noble Birth: The hero is born into a high social rank or noble family. Macbeth is the Thane of Glamis at the start of the play.
- Hamartia (tragic flaw): The hero has a personal flaw or makes a mistake. Macbeth's hamartia is his dark and unchecked ambition.
- Peripeteia (reversal of fortune): The hero experiences a reversal of fortune from good to bad. Macbeth's peripeteia is the regicide.
- Hubris (excessive pride): The hero often exhibits hubris, which means they have excessive pride or arrogance. Macbeth demonstrates this at the end, believing he cannot be killed because of the witches' assurance he will not be killed by someone born of a woman.

English - Macbeth

6. Top twenty quotations

1. “Fair is foul, and foul is fair / Hover through the fog and filthy air.” Witches
2. “Till he unseam'd him from the nave to the chaps, / And fix'd his head upon our battlements.” Sergeant
3. “Oftentimes, to win us to our harm, the instruments of darkness tell us truths… to betray us.” Banquo
4. “Stars, hide your fires / Let not light see my black and deep desires” Macbeth
5. “Unsex me here / And fill me from the crown to the toe topfull of direst cruelty” Lady Macbeth
6. “Look like the innocent flower / But be the serpent under’t” Lady Macbeth
7. “I have no spur / To prick the sides of my intent, but only / Vaulting ambition, which o'erleaps itself / And falls on the other.” Macbeth
8. “When you durst do it, then you were a man.” Lady Macbeth
9. “But wherefore could not I pronounce 'Amen’? I had most need of blessing, and 'Amen’ stuck in my throat.” Macbeth
10. “Will all great Neptune’s ocean wash this blood / Clean from my hand?” Macbeth
11. “Most sacrilegious murder hath broke ope / The Lord’s anointed temple.” Macduff
12. “Dark night strangles the travelling lamp.” Ross
13. “O, full of scorpions is my mind, dear wife!” Macbeth
14. “Though canst not say I did it; never shake thy gory locks at me… Hence, horrible shadow, Unreal mock’ry, hence.” Macbeth
15. “Our country… weeps, bleeds, and each new day a gash is added to her wounds.” Malcolm
16. “Justice, verity, temperance, stableness, bounty, perseverance, mercy.” Malcolm
17. “Out, damned spot! Out I say!… Will these hands ne’er be clean?” Lady Macbeth
18. “Abhorred tyrant.” Young Siward
19. “These juggling fiends no more believ’d that palter with us in a double sense.” Macbeth
20. “This dead butcher and his fiend like queen.” Malcolm

7. Motifs

7a = Light and Darkness The motif of light and darkness is used to symbolise the battle between good and evil. Light represents purity, truth, and life, while darkness signifies evil, deceit, and death. Macbeth himself acknowledges this when he calls on the night to hide his dark desires and the murder of King Duncan takes place at night shrouded in darkness.

7b = Nature Throughout the play, the weather plays an important role. The rebelling nature of wind and the sun indicates the disruption within the natural order of society. Animals, too, respond to the chaos caused by Macbeth's unnatural actions. For example, Duncan's horses are said to have eaten each other and an owl kills a falcon.

7c = Blood The constant presence of blood in Macbeth repeatedly reminds the audience about how serious the consequences of the characters’ violent and destructive actions are. Macbeth asks whether ‘Neptune’s oceans’ will remove the blood from his hands, following the regicide. Imaginary blood represents guilt for Macbeth and Lady Macbeth. Lady Macbeth hallucinates, seeing blood on her hands, just before she dies.

8. Authorial intent

Shakespeare adapted the story of Macbeth from historical sources, primarily Holinshed's Chronicles, a history of England, Scotland, and Ireland. Many of the details in Shakespeare’s play, such as Macbeth's encounter with the witches, the murder of King Duncan, and Macbeth’s eventual demise, appear in these chronicles. Shakespeare, chose to adapt this historical account in order…

8a = To flatter… King James I, who was deeply concerned about witchcraft. The character of Banquo, depicted as an honourable figure, was included to reflect with King James's lineage, as the king claimed descent from Banquo, as outlined in Holinshed’s Chronicles.

8b = To condemn… regicide. The murder of King Duncan is depicted as a heinous crime that disrupts the moral and political order, leading to chaos and suffering.

8c = To warn against… the dangers of unchecked ambition, Shakespeare crafted Macbeth’s rise and downfall to show how the lust for power can lead to one’s destruction.

8d = To highlight… the consequences of moral corruption and aligning with the supernatural. The play portrays how Macbeth and Lady Macbeth’s descent into evil leads to their ultimate ruin and the disorder of the natural order.

English - Macbeth

9. Vocabulary

9a = prophecy (noun) a prediction of what will happen in the future
9b = ambition (noun) a a strong desire to do or achieve something.
9c = duplicitous (adjective) dishonest or hiding the truth.
9d = equivocate (verb) to speak in a way that is intentionally not clear, in order to mislead someone or hide the truth.
9e = heinous (adjective) wicked and evil.
9f = hubris (noun) excessive pride or self-confidence.
9g = regicide (noun) the action of killing a king.
9h = sceptical (adjective) doubting that something is true or useful.
9i = malevolent (adjective) evil; wanting to cause great harm.
9j = treachery (noun) behaviour that is not loyal; betrayal of trust
9k = usurp (verb) take (a position of power or importance) illegally or by force.
9l = Machiavellian (adjective) using clever but often dishonest methods that deceive people so that you can win power; cunning and scheming
9m = emasculate (verb) to make a man feel less powerful by reducing his confidence and perceived strength.
9n = tyranny (noun) government by a ruler who has unlimited power over the people and uses it cruelly.
9o = benevolent (adjective) kind and helpful.
9p = avenge (verb) to do harm to or punish a person responsible for harm, in order to achieve a fair situation.
9q = demise (verb) the death of a person.
9r = ruthless (adjective) not thinking or worrying about any pain caused to others; cruel.
9s = ramifications (noun) the possible, and often serious, results of an action.
9t = deception (noun) the act of hiding the truth, especially to get an advantage.
9u = subvert (verb) to go against or destroy the power and influence of something.

10. Subject Vocabulary

10a = play (noun) A dramatic piece of literature intended to be acted out on the stage.
10b = act (noun) A way of dividing a **play**. Each act is a group of **scenes**.
10c = scene (noun) A dramatic part of the story of a play, at a particular time and place and a way of dividing **acts** into smaller parts.
10d = stage direction (noun) An instruction in a play that tells actors how to move or speak, or gives information about the setting, sound effects or lighting.
10e = characterisation (noun) The creation or construction of a fictional character.
10f = protagonist (noun) The main character
10g= language (noun) Words or methods (techniques) used by writers to present their meanings or create effects.
10h = connotations (noun) A feeling or idea that is suggested by a particular word.
10i = imagery (noun) The use of language to create vivid pictures in the readers' minds.
10j = metaphor (noun) Comparing one thing to another directly – as if one thing **is** another – to highlight their similarities.
10j = symbol (noun) A character, idea, image or setting that represents a bigger idea.
10l = euphemism (noun) A mild or indirect word or expression used for one considered to be too harsh or blunt.
10m = allusion (noun) An unexplained reference to someone or something outside of the text e.g. biblical allusion.
10n = rhyming couplet (noun phrase) Two lines of verse (in a poem or a play by Shakespeare) whose final sounds rhyme
10o = foreshadowing (noun/verb) An indication or hint of what is to come later in the story.
10p = soliloquy (noun) A character speaking to him or herself, relating his or her innermost thoughts and feelings as if thinking aloud.
10q = foil (noun) A character who contrasts with another to highlight their different traits and motivations.
10r = motif (noun) An important idea or image that is repeated throughout a piece of writing.
10s = tragedy (noun) A play that relates the sorrowful or terrible events encountered or caused by a heroic individual.
10t = imperative (noun) A command or an order.

English - A Christmas Carol

1. Plot

1a. Stave 1 Ebenezer Scrooge – a callous and selfish miser – is introduced. In his counting house, where he works as a money lender, he is visited by his nephew who he treats with contempt, rejecting his invitation to dinner on Christmas Day and rebuking his passion for the festive season. Next, he dismisses two charity men who are collecting money for the poor. Resentfully, he allows Bob Cratchit the day off for Christmas Day, before going home. It is here that he is visited by the ghost of his dead business partner: Jacob Marley. Wearing a weighty chain, he is condemned to wander the Earth and witness suffering, as a punishment for his greed and ignorance in life. Marley tells Scrooge that he is destined to do the same but he has a chance to escape this fate and that he will be visited by three more ghosts. Scrooge falls asleep.

1b. Stave 2 The Ghost of Christmas Past is the first of the spirits to visit Scrooge. The ghost takes Scrooge to see his old school, where he sees himself alone – a painful memory. Next, he is taken to the place he was an apprentice for Fezziwig and witnesses the jovial party that Fezziwig throws for his family and employees. Scrooge is then distressed to witness his former fiancée breaking off their engagement and as an older woman, happily spending time with her husband and raucous children. Scrooge cannot bear to watch so tries – and fails - to extinguish the ghost's light.

1c. Stave 3 The Ghost of Christmas Present appears and shows Scrooge society celebrating Christmas, first wandering the streets then visiting the Cratchit family. He witnesses the small meal they enjoy but their contentment and appreciation. Next, Scrooge is taken to a number of remote locations – a mining village, a lighthouse and a ship in the middle of the ocean – where people are celebrating Christmas despite their isolation. The ghost then transports him to Fred's house, where they are playing games. Finally, as the ghost physically appears to be growing older, Ignorance and Want are revealed.

1d. Stave 4 The Ghost of Yet to Come takes Scrooge to witness a series of gatherings, all focusing on the death of the same man. Scrooge is taken to see people selling the dead man's stolen belongings and insulting him ruthlessly. He hears a young couple talking happily about the death as it means they have some more time to repay a debt. He visits the Cratchit family, in mourning for the death of Tiny Tim. Finally, he is taken to a graveyard where it is revealed that he is the lonely, unloved dead man. He realises he can change this fate and pledges to become a better person.

1e. Stave 5 Scrooge is overjoyed to wake up on Christmas morning. He donates a substantial amount of money to the charity men, sends a prize turkey to the Cratchit family, goes to Church and visits Fred's house for dinner. The next day, he tells Bob that he will increase his salary and promises to help him further. Finally, readers are informed that he changes his ways and treats Tiny Tim – who did not die – as his own child.

2. Characters

2a. Ebenezer Scrooge The novella's main protagonist. A cold, isolated miser whose experiences with the ghosts result in his redemption. By the end, he is socially conscious and philanthropic.

2b. Bob Cratchit Scrooge's only employee, a clerk, treated cruelly by him but content with the love of his family.

2c. Fred Scrooge's nephew (his sister Fan's son). An excitable, generous and forgiving man who attempts to share the merriment of Christmastime with his uncle. Scrooge's foil.

2d. The Ghost of Jacob Marley Scrooge's dead business partner who appears as a ghost to warn Scrooge of the error of his ways.

2e. The Ghost of Christmas Past Allegorical of memory, he shows Scrooge events from his past. He has a strange, fluctuating appearance and a jet of light streaming from his head – symbolic of hope and truth.

2f. Fezziwig Scrooge's old employer. He treats his employees generously. Scrooge's foil.

2g. Belle Scrooge's young love who breaks off their engagement because of Scrooge's changing nature and attitude to money.

2h. The Ghost of Christmas Present Sitting atop a throne of food, this ghost is large and commanding. He symbolises the Christmas spirit, sprinkling incense from his torch to assist those who need his help, and showing Scrooge how Christmas should be celebrated.

2i. Tiny Tim Bob Cratchit's disabled, thoughtful son. He rises above his own suffering to think of others.

2j. Ignorance and Want Two emaciated, animalistic children who symbolises society's vices: a wilful lack of awareness of the plight of the poor and greed that leaves others wanting.

2k. The Ghost of Christmas Yet to Come The most ominous of the spirits, a spirit who does not speak and completely covered in a black garment. He is the ghost Scrooge fears most of all.

English - A Christmas Carol

3. Context

3a. Charles Dickens When he was a child, Dickens attended private schools. When he was 12, his father was sent to debtor's prison and Dickens was sent to work in a blacking factory, labelling bottles of black polish. Later in life, he read a report on child labour in the UK. This prompted him to write A Christmas Carol, in order to criticise the treatment of the most vulnerable in society. His disabled nephew inspired Tiny Tim's character.

3b. Victorian London Victorian England was a time of huge population increase, almost doubling from 16.8 million in 1851 to 30.5 million in 1901. London became the most advanced and wealthiest city in the world. However, constant factory production caused a black smog of smoke to hang over the city. Buildings were filthy, streets crowded and overpopulated. The Industrial Revolution meant that machines took over many jobs previously carried out by people. People moved to cities, such as London, but here demand for jobs was high and pay low. London – like Victorian England more widely – was a place of stark inequality between the rich and poor.

3c. The Poor Law and The Workhouse In 1834 , a law was passed that stopped Government money going to the poor except in exceptional circumstances. Instead, those who could not afford to support themselves were sent to workhouses: places where people were given food and clothes in exchange for hours of manual labour and where conditions were poor.

3d. Malthusian Theory The Rev. Thomas Malthus, a respected economist and writer, warned against helping when people were hungry because it would lead to a population size that was too big. He believed that population would always grow faster than access to food. A Christmas Carol is a refutation of this theory.

3e. Education Dickens believed that many of the problems in Victorian society, such as crime, poverty and disease were caused by lack of education. The poor in Victorian Britain had little or no education. He supported several projects to educate the poor, such as the Ragged Schools, which offered free education, clothing and food to children from poor families.

3f. Christianity and Christmas In the early 1800s, Christmas was observed more as a religious festival rather than a holiday and time of sumptuous celebration. The novella is often credited with spreading popular traditions and reminding people of the
need for kindness, familial love, charity and happiness at Christmastime. Victorians believed in following certain rules in order to be a good Christian, including attending Church on a Sunday and not working on Sundays – known as Sabbatarianism.

4. Vocabulary

4a = philanthropy (noun) The desire and active effort to help others, especially through the donation of money

4b = misanthrope (noun) A person who dislikes humankind and avoids human contact

4c = poverty (noun) The condition of being extremely poor

4d = plight (noun) A dangerous, difficult situation; struggle; difficulty

4e = injustice (noun) Lack of fairness; unfair treatment in a situation

4f = avarice (noun) Extreme greed

4g = parsimonious (adjective) Very unwilling to spend money

4h = facetious (adjective) Treating serious issues with deliberately inappropriate humour or sarcasm

4i = supernatural Above or beyond what is natural; otherworldly

4j = didactic (adjective) Intended to teach, or to improve morals by teaching

4k = humanity Human beings collectively; the quality of being kind and compassionate

4l = Sabbatarianism (noun) The belief of some Christians that no work should be carried out on the Sabbath (usually a Sunday), as it is a holy day.

4m = Malthusian (adjective) Relating to Thomas Malthus, the economist and writer who believed the poor would likely die if resources such as food became too expensive and this was a natural way to control the population size

4n = catalyst (noun) Someone or something that encourages progress or change

4o = redemption (noun) The act of being saved from sin or past mistakes

4p = social reform (noun phrase) A change and improvement to the way a country is run or organised

Subject Vocabulary

4q = novella (noun) A short novel

4r = protagonist (noun) The main character in a novel, play or film

4s = allegory (noun) A story that can be interpreted to reveal a hidden meaning, typically a moral or political one

4t = context (noun) The circumstances surrounding writing; social issues, historical events, author's background and beliefs, and how they influence a writer's choices

4u = characterisation (noun) A method used by writers to create and craft characters.

4v = foil (noun) A character who contrasts with another

4w = symbol (noun) A character, idea, image or setting that represents a bigger idea

4x = imagery (noun) The use of language to create vivid pictures in the readers' minds

4y = pathetic fallacy (noun) Giving human feelings and emotions to something not human, particularly the weather or environment

4z = motif (noun) An important idea or image that is repeated throughout a piece of writing.

English - A Christmas Carol

5. Authorial Intent

Charles Dickens wrote this novella for a purpose and uses the plot, characters and settings to send a message to his readers...

5a - To encourage... his Victorian readers to acknowledge the plight of the poor and to and exposes his reader to the terrible suffering they endure.

5b – To expose... his readers to the injustices of the class system of Victorian Britain and the mistreatment of the working class.

5c – To refute... Malthusian theory and champion the idea that everybody in society can live a happy life if resources are shared and the rich are charitable and distribute their wealth.

5d – To warn... of the terrifying consequences of forsaking philanthropy and Christian duty and neglecting the needs of those who are less fortunate

5e – To present... a scathing social commentary on Victorian society and to challenge the misanthropic views of his wealthy reader.

5f – To celebrate... the contentment of close family relationships and the contentment of the festive season - a time for kindness, charity and peace for all.

5g - The text is relevant today as... social inequality and injustice still affects many people in modern Britain, as evidenced by the cost of living crisis and the rising number of people accessing food banks.

6. Themes

6a = Poverty Dickens felt strongly that Victorian society ignored the poverty of the working class and underclass. While the rich who enjoyed excess and comfort at Christmas, the poor – including vulnerable children - were forced to live in dreadful conditions in workhouses or in utter destitution. Through the novella he suggests that poverty leads to suffering, death, dehumanising of individuals, crime and misery.

6b = Greed Dickens suggests that greed is the cause of poverty and if the avaricious Victorian rich would acknowledge the plight of the poor then the cycle of poverty and misery could be broken. He also conveys the idea that prioritising wealth over everything else leads to isolation from family and friends – a melancholy existence.

6c = Charity and Philanthropy Dickens wanted his rich Victorian readers to understand the benefits of charity and the importance of the rich seeing charity as their social obligation and duty. Sharing wealth could end the suffering of many poor people and make those who contribute to those in poverty happy and content too.

6d = Christmas Christmas is a Christian celebration of the birth of Christ, though it also encompasses Greek, Roman and pagan traditions of giving gifts and feasting around the Winter Solstice. It is a time when families and friends come together to share food and exchange gifts. The story of Scrooge takes place on Christmas Eve and Christmas Day and uses the ideas of generosity and compassion – embodied by characters
such as the Ghost of Christmas Present, Fred and Fezziwig - that we associate with Christmas to highlight the joy of the festive season. Scrooge is shown that even the poor and isolated characters (The Cratchit family, the miners and sailors) find comfort in Christmas celebrations.

6e = Family Closely linked to Dickens' purpose of popularising an emotional element to Christmas is his presentation of family. The contentment of family life is highlighted by the older Belle and the Cratchit family who, while financially poor, are emotionally rich because of their familial love. Eschewing family leads to misery, as Scrooge emphasises at the start of the novella.

6f = Redemption Redemption is the idea of being saved from sin or evil. In Scrooge we see a man who is transformed from a greedy, selfish miser into a generous and good-natured character by the end. He is shown the error of his ways by the ghosts that visit him and is redeemed by his own willingness to change. The moral message of the novella is that all human beings – even the most misanthropic - have the opportunity to behave in kinder ways towards each other.

English - A Christmas Carol

7. Key Quotations and Methods

7a. "A … covetous old sinner!" Adjective 'covetous' - jealous of others' money, avaricious; religious reference – Scrooge's unchristian nature

7b. "Solitary as an oyster" Simile - Scrooge's isolation as he puts a barrier between himself and humanity; image hints at something more worthy inside Scrooge, as a pearl is sometimes found in an oyster shell

7c. "Christmas time … when men and women… open their shut-up hearts freely" Metaphor – Fred's love for the festive season and the kindness and charity that it inspires in others

7d. "Many thousands are in want of common necessaries" Statement – extent of poverty in London and the plight of the poor

7e. "If they would rather die, they had better do it and decrease the surplus population" Dismissive tone and reference to Malthusian theory – Scrooge's ignorant and callous attitude to the poor

7f. "A poor excuse for picking a man's pocket every twenty-fifth of December!" Metaphor and irony – Scrooge reluctant to give his clerk, Bob Cratchit, a paid day off for Christmas Day, even though he is able to financially

7g. "I wear the chain I forged in life" Symbol – the chain is a symbol of Marley's relentless punishment for his greed in life, metaphorically 'forged' in the fires of his sin and ignorance

7h. "Mankind was my business" Statement and simple sentence – unarguable message that charity and social conscience are vital

7i. "From the crown of its head there sprung a bright clear jet of light" Symbol – the light emanating from the ghost's head is symbolic of hope and truth

7j. "A small matter to make these silly folks so full of gratitude" Irony – Scrooge is himself a cruel employer, unwilling to spend any money on Bob Cratchit – changing character

7k. "Another idol has displaced me… A golden one" Metaphor – Belle breaks off the engagement because Scrooge reveres money more than her – goes against the 10 commandments – conveys how avarice can destroy personal relationships

7l. ""To any kindly given. To a poor one most."… "Because it needs it most." Dialogue – generosity and compassion of the Ghost of Christmas Present

7m. "God bless us, everyone." Religious reference – Tiny Tim is pious and wants all to be protected and made happy by God

7n. ""I see a vacant seat… and a crutch without an owner." Poignant image and euphemism – Tiny Tim will die but the idea is so distressing that the ghost at first cannot articulate it bluntly

7o. "His offences carry their own punishment" Connotations – Fred believes Scrooge's actions are morally 'criminal'

7p. "They were a boy and a girl. Yellow, meagre, ragged, scowling, wolfish." Symbols and listing of adjectives – Ignorance and Want are symbols of the ignorance of the Victorian rich and the resulting struggles of the most vulnerable – adjectives suggest the lack of dignity, misery and emaciation as a result of poverty

7q. "Its mysterious presence filled him with a solemn dread." Image and unsettling tone – the final ghost instills fear in Scrooge and makes his redemption certain

7r. "The whole quarter reeked with crime, with filth and misery." Setting and listing – the slum where the poorest in London live symbolises the plight of the poorest and the necessity of crime for them to survive

7t. "Happy as an angel!" Simile and religious reference – the contentment that charity and kindness brings – Christian virtues bring you closer to God

English – Language paper 1

1. The Questions

Question 1: List four things... [4]

- ✓ 5 minutes
- ✓ Use the correct line numbers.
- ✓ Write four different ideas that directly answer the question

Question 2: Language [8]

- ✓ 10 minutes
- ✓ Focusing on the key idea in the question, highlight and annotate the best quotations.
- ✓ Write your answer using two or three What, How, Why paragraphs - say a lot about a little!

Question 3: Structure [8]

- ✓ 10 minutes
- ✓ Select important structural features to analyse, including the opening and the ending (use your paragraph summaries to help you).
- ✓ Write your answer using SEW (structure method, evidence, why) paragraphs.

Question 4: Evaluating a statement and a writer's methods (use methods from Questions 2 and 3 + effect + evaluate statement) [20]

- ✓ 20 minutes
- ✓ Mark out the given line numbers.
- ✓ Read the statement and highlight the key ideas. Think about your response to it.
- ✓ Find the best quotations to support your response to the statement and annotate with their methods.
- ✓ Quickly plan then write your answer using SEMA (statement, evidence, method, analyse) paragraphs, linking your analysis back to the statement.

2. Language Methods Terms

(use these in Q2 and Q4)

noun	identifies a person, thing, idea or state
adjectives	words that describe the noun
verb	describes an action, event, situation or change
adverb	gives information about a verb
sensory imagery	when the writer provides mental "pictures" using the senses
repetition	Using a word or phrase more than once
simile	something is presented as like something else
metaphor	something is described as something else
personification	giving human traits to something non-human
semantic field	a set of words related in meaning
alliteration	repetition of the same sound at the start of a series of words
sibilance	repetition of the 's' sound at the start of a series of words
plosive sounds	harsh letter sounds such as 't', 'd' and 'k'
onomatopoeia	sound words
pathetic fallacy	weather reflects the mood
hyperbole	purposely exaggerated ideas
juxtaposition	two opposing ideas
symbol	the use of characters, events or ideas to represent something broader

3. Structure Methods Terms

(use these in Q3 and Q4)

opening	the way the extract begins
character introduction	the first description of a person in the text
cyclical	ends the same way it begins
focusing attention	our attention is aimed at something
building	when an idea/tension is increased
developing	an earlier point is extended
narrative shift	a swift or change of focus
zooming in	detailed description of something
zooming out	showing the reader the bigger picture
flash-forward	presents future events
foreshadowing	hints at what's to come
climax	the most intense point
dialogue	lines spoken by characters
flashback	presents past events
internal thoughts	description of what a character is thinking or feeling
external action	description of events outside the character
ending	the last ideas/events in the Source

English - Language paper 1

4. Verbs for Analysis

Shows For explicit/ obvious meanings	Suggests For what the writer wants us to work out based on clues, inferences implicit meanings	Highlights For ideas made very clear and stressed by the writer as very important	Links to For making connections between quotations from different parts of a text	Other
Reveals demonstrates Exposes Tells the reader/ audience Conveys Presents Depicts	Implies Hints at Connotes Intimates Indicates Alludes to	Emphasises Underlines Reiterates (for something shown more than once) Accentuates Underscores	Relates to Echoes Mirrors Augments Develops Contrasts Juxtaposes Diverges from	Evokes Establishes Symbolises

5. Connectives for Developing Ideas

To order ideas:	To add a different idea:	To add:	To sum up:
Firstly...secondly Finally Lastly To conclude	By contrast On the contrary Although However Alternatively On the other hand Conversely Despite	This also In addition Furthermore Moreover Again Therefore Consequently What is more Then again Subsequently	Ultimately Above all It is evident that

6. Sentence Stems

Q2	The writer describes …… The use of the [language method] demonstrates…… * Furthermore, the word/phrase "……." powerfully evokes …….
Q3	At the beginning of the Source, the writer focuses the reader's attention on……. As the Source progresses, the writer adds to / contrasts ….. * The conscious introduction of ……. as the Source develops builds / contrasts ……. Finally, the writer of the Source ends with ……
Q4	I wholeheartedly/ partially agree that ……. The writer describes "……", which reveals…… The [language/structure method] highlights…… This indicates……. [link to statement].

7. Words to identify writers' emotions:

☺		☹	
Content	Euphoric	Perplexed	Overwhelmed
Assured	Optimistic	Suspicious	Dejected
Captivated	Grateful	Irritated	Indifferent
Curious	Delighted	Indignant	Disgusted
Composed	Untroubled	Unsettled	Enraged
Exhilarated	Proud	Pessimistic	Alarmed

English - Language paper 1

7. Approaching the Question

Plan!
5 minutes

Write
35 minutes

Proof-read
5 minutes

Section B: Writing

You are advised to spend about 45 minutes on this section.
Write in full sentences.
You are reminded of the need to plan your answer.
You should leave enough time to check your work at the end.

Q5: Your school has asked for creative writing pieces to include in their newsletter to parents.

EITHER: Write a description as suggested by this picture:

OR: Write the opening of a story set at night.

(24 marks for content and organisation
16 marks for technical accuracy)
[40 marks]

8. The Mark Scheme

Have you:

Content and Organisation /24	a) Register matches audience and purpose	• Used a descriptive, creative style? • Included a range of descriptive methods, including simile, metaphor, personification and imagery?
	b) Vocabulary and linguistic devices	• Used a range of interesting and challenging word choices? • Used thoughtful, challenging descriptive methods,
	c) Structural features	• Crafted an engaging opening and a thoughtful ending? • Included foreshadowing, a flashback or flashforward, a motif or circular structure?
	d) Ideas	• Included interesting and convincing ideas? • Linked your ideas together coherently throughout the narrative or description?
	e) Paragraphing	• Used paragraphs in your extended writing and linked them together? • Used a range of paragraph lengths for effect?
Technical Accuracy /16	f) Sentence demarcation	• Ended your sentences correctly, using a full stop, exclamation mark or question mark? • Avoided comma splicing?
	g) Punctuation	• Used basic punctuation correctly, including full stops, commas and capital letters? • Used more complex punctuation e.g. semi-colon, colon and dash?
	h) Sentence forms	• Used a range of minor, simple, compound and complex sentences? • Used a range of sentence starters?
	i) Standard English	• Used formal word choices? • Used grammatically correct phrases?
	j) Spelling	• Used correct spellings? • Selected correct homophones e.g. there/their/they're; to/too/two; weather/whether.
	k) Vocabulary	• Used a range of challenging word choices precisely?

9. DISCO!

Drop into your setting (action!)

Zoom In

Shift in time (flashback)

Comment (one line of reported speech)

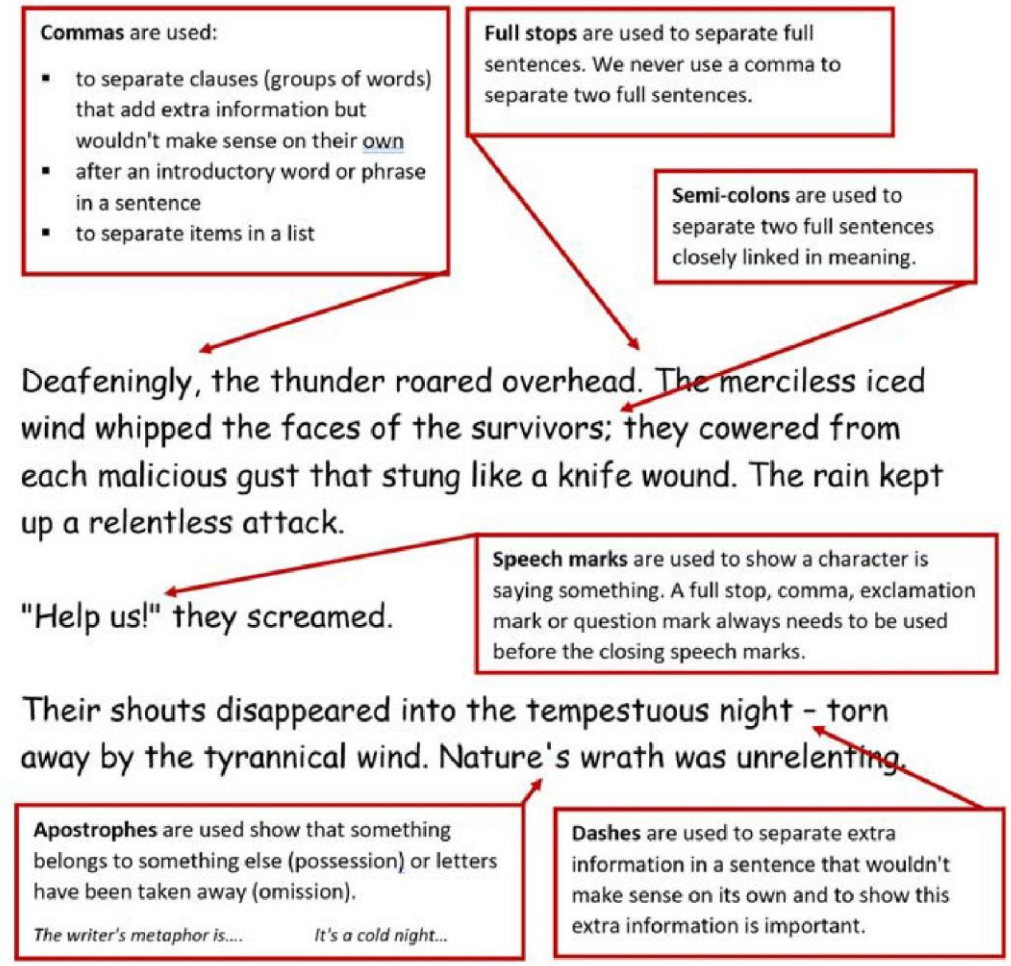
Overview (return to opening description but change something significant

English - Writing 40 marks (50% of Language Paper 1 – 45 minutes)

9. Vocabulary

Key Terms	Description
Alluring	powerfully attractive or interesting
Awe	a feeling of great respect and wonder
Captivating	capable of holding someone's interest
Emanates	comes out from or spreads out from
Enlightened	showing understanding to act positively
Ethereal	light and delicate, in a way that makes something seem heavenly
Euphoric	extremely happy or excited
Dreary	depressingly dull or gloomy
Grave	serious in behaviour or appearance or a place where dead bodies are buried
Inescapable	unable to get away from
Loathsome	causing hatred or disgust
Luminous	giving off light; bright or shining
Merciless	showing no kindness
Melancholy	sadness; downheartedness
Morose	unhappy and unwilling act in a happy way
Oppressed	treated harshly and cruelly
Serene	calm, peaceful, untroubled
Shrouded	covered up, making it hard to see or wrapped in material ready to be buried
Tumultuous	very loud or full of confusion
Triumphantly	in a way that shows great happiness at a victory (winning something) or achievement.
Tyrant	a cruel leader
Vivacious	full of energy and enthusiasm
Wither	to become dry, wrinkled or shrivelled

10. Punctuation



Maths

1.Number

Topic	Topic Code	Rag Rating		
		R	A	G
Ordering positive integers	U600			
Ordering decimals	U435			
Ordering negative numbers	U947			
Adding and subtracting positive integers	U417			
Multiplying and dividing positive integers	U127, U453			
Adding and subtracting negative numbers	U742			
Multiplying and dividing negative numbers	U548			
Adding and subtracting decimals	U478			
Multiplying and dividing with place value	U735			
Multiplying and dividing with decimals	U293, U868			
Order of operations	U976			
Prime numbers, prime factorisation	U236, U739			
Factors, multiples, HCF and LCM	U211, U751, U529			
Powers and roots	U851			
Using standard form	U330, U534			
Calculating with standard form	U264, U290, U161			
Equivalent fractions and simplifying fractions	U704, U646			
Mixed numbers and improper fractions	U692			
Ordering fractions	U746			
Addition and subtraction of fractions	U736, U793			
Multiplication and division of fractions	U475, U544			
Converting and ordering fractions, decimals and percentages	U888, U594			
Fractions of amounts	U881, U916			
Percentages of amounts	U554, U349			
Percentage change	U773, U671			
Reverse percentages	U286, U278			
Simple interest	U533			
Rounding	U480, U298			
Rounding to significant figures	U731, U965			
Estimating answers	U225			
Value for money	M681			

2. Statistics

Topic	Topic Code	Rag Rating		
		R	A	G
Collecting data, frequency tables	U322, U120			
Two-way tables	U981			
Bar charts	U363, U557			
Pictograms	U506			
Pie charts	U508, U172			
Stem and leaf diagrams	U200, U909			
Mode	U260			
Mean	U291			
Median	U456			
Range	U526			
Choosing averages	U717			
Scatter graphs	U199, U277, U128			

3. Ratio and proportion

Topic	Topic Code	Rag Rating		
		R	A	G
Simplifying ratios	U687			
Sharing amounts in a ratio	U753, U577			
Converting between ratios, fractions and percentages	U176			
Direct proportion	U721, U640			
Inverse proportion	U357, U364			
Proportion graphs	U238			
Units of measure: Length, Mass and Capacity	U102, U388			
Units of measure: Time	U902			
Units of measure: Area	U248			
Currency conversion	U610			
Conversion graphs	U652, U638, U862			
Compound units: Speed	U151			

Maths

4.Probability

Topic	Topic Code	Rag Rating		
		R	A	G
Probability scale	U803			
Probability of single events	U408, U510, U683			
Experimental probability	U580			
Expected outcomes	U166			
Listing elements in a set	U748, U296			
Probability from Venn diagrams	U4765			
Frequency trees	U280			
Sample space diagrams	U104			
Tree Diagrams	U558, U729			

5. Algebra

Topic	Topic Code	Rag Rating		
		R	A	G
Algebraic expressions	U613			
Collecting like terms	U105			
Substitution	U201, U585, U144			
Expanding brackets	U179, U768			
Factorising expressions	U365			
Index laws	U235, U694, U662, U103			
Changing the subject	U556			
Coordinates	U789, U889			
Midpoints	U933			
Plotting straight line graphs	U741			
Equations of straight line graphs	U315, U669			
Parallel lines	U377			
Distance-time graphs	U403, U914, U462, U966			
Quadratic graphs	U989, U667			
Linear equations	U755, U325, U870, U505, U599			
Quadratic expressions and equations	U178, U228			
Linear sequences	U213, U530, U498, U978			
Other sequences	U958, U680			

6. Geometry

Topic	Topic Code	Rag Rating		
		R	A	G
Properties of 2D shapes	U121, U849			
Properties of 3D shapes	U719			
Nets of 3D shapes	U761			
Angles: Measuring, Drawing and Estimating	U447			
Angle on a line and about a point	U390			
Vertically opposite angles	U730			
Angles on parallel lines	U826			
Angles in a triangle	U628			
Combining angle facts	U655			
Angles in a quadrilateral	U732, U329			
Angles in polygons	U427			
Bearings	U525, U107			
Translations	U196			
Reflections	U799			
Enlargements	U519			
Rotations	U696			
Congruence	U790, U866			
Area and perimeter of simple shapes	U993, U970, U351, U226			
Area of triangles, parallelograms and trapeziums	U945, U575, U424, U265, U343			
Circles	U767			
Circumference	U604, U221			
Circle area	U950, U373			
Surface area	U929, U259, U871			
Volume of cuboids	U786			
Volume of prisms and cylinders	U174, U915			
Similar shapes	U551, U578			
Scale diagrams	U257			

Maths

1.Number

Topic	Topic Code	Rag Rating R	A	G
Calculating with roots and fractional indices	U851, U985, U772, U299			
Converting recurring decimals to fractions	U689			
Surds	U338, U663, U872, U499			
Rationalising the denominator	U707, U281			
Error intervals	U657, U301, U587			

2. Statistics

Topic	Topic Code	Rag Rating R	A	G
Averages	U877, U717			
Cumulative frequency diagrams	U182, U642			
Box plots	U879, U837, U507			
Frequency polygons	U840			
Histograms	U814, U983, U267			
Capture-recapture	U328			

3. Probability

Topic	Topic Code	Rag Rating R	A	G
Product rule for counting	U369			
Conditional probability	U246, U821, U806			
Probability from Venn diagrams	U476, U748, U699			

4. Geometry

Topic	Topic Code	Rag Rating R	A	G
Congruence proofs	U866, U887			
Enlargements	U134			
Describe combined transformations	U766			
Circle theorems: Angles inside a circle	U459, U251			
Circle theorems: Tangents and chords	U489, U130			
Circle theorems problems	U808			
Prove circle theorems	U807			
Volume of frustums	U350			
Volume: Problem solving	U543, U426			
Similar Shapes: Area and volume	U630, U110			
Pythagoras' Theorem in 2D and 3D	U385, U541			
Right-angled trigonometry: Problem solving	U319, U283, U545, U967			
3D trigonometry	U170			
The area rule	U592			
Sine rule	U952			
Cosine rule	U591			
Trigonometry and bearings	U164			
Vectors problems	U781, U560			

5. Algebra

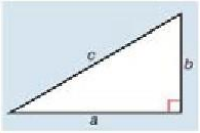
Topic	Topic Code	Rag Rating R	A	G
Expanding triple brackets	U606			
Operations with algebraic fractions	U685, U457, U824			
Factorising quadratic expressions: ax^2+bx+c	U858			
Simplifying algebraic fractions	U294			
Factorising to solve quadratics equations	U228, U960			
Using the quadratic formula	U665			
Completing the square to solve quadratics	U397, U589			
Quadratic equations in context	U150			
Quadratic simultaneous equations	U547			
Index laws	U235, U694, U662			
Equation of a straight line: Perpendicular lines	U898			
Quadratic graphs: Turning points	U769			
Quadratic simultaneous equations on graphs	U875			
Exponential graphs	U229			
Exponential growth and decay problems	U988			
Trigonometric graphs	U450			
Graph transformations	U598, U487, U455			
Velocity-time graphs	U937, U562, U611			
Rate of change graphs	U638, U652, U862			
Estimating gradient from a curve	U800			
Estimating area under a curve	U882			
Equation of a circles and tangents	U567			
Linear inequalities as graph regions	U747			
Quadratic inequalities	U133			
Functions	U637, U895, U448, U996			
Recurrence relations	U171			
Quadratic sequences	U206			
Iteration and numerical methods	U434, U168			
Algebraic proof	U582			

Maths - Key formulae

1. Pythagoras

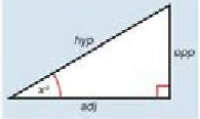
Pythagoras' Theorem

For a right-angled triangle,
$a^2 + b^2 = c^2$



Trigonometric ratios (*new to F*)

$\sin x° = \frac{opp}{hyp}$, $\cos x° = \frac{adj}{hyp}$, $\tan x° = \frac{opp}{adj}$

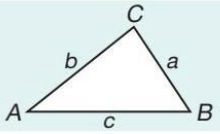


2.Trigonometric formulae

Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine Rule $a^2 = b^2 + c^2 - 2bc \cos A$

Area of triangle $= \frac{1}{2} ab \sin C$

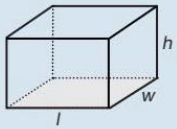


Foundation tier formulae

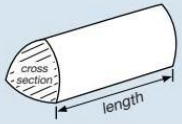
Higher tier formulae

3. Volumes

Cuboid = $l \times w \times h$

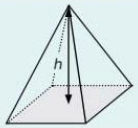


Prism = area of cross section × length



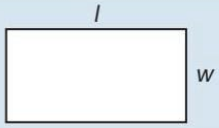
Cylinder = $\pi r^2 h$

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

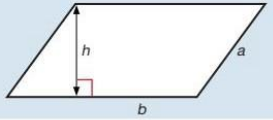


4. Areas

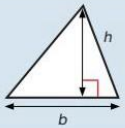
Rectangle = $l \times w$



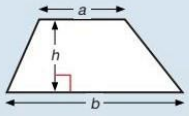
Parallelogram = $b \times h$



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



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

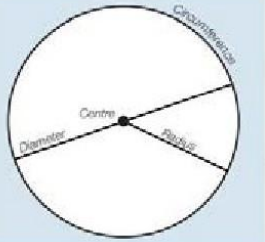


5. Circles

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

Circumference = $2 \times \pi \times$ radius, $C = 2\pi r$

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



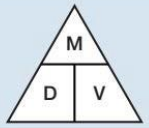
6. Compound measures

Speed

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

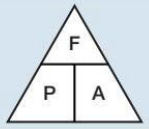
Density

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



Pressure

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

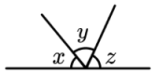
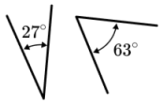
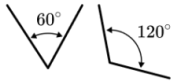
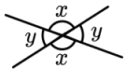


7. Quadratic equations

The Quadratic Equation

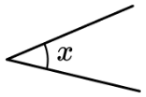
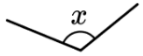
The solutions of $ax^2 + bx + c = 0$,
where $a \neq 0$, are given by $x = \frac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$

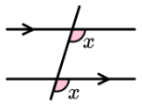
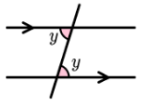
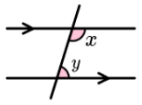
Maths – Angle facts

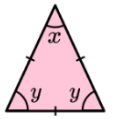
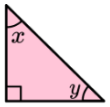
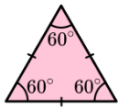
Angle Rule	Description	Diagram
Angles on a straight line	The sum of angles on a straight line is 180°. $x + y + z = 180$	
Angles at a point	The sum of angles at a point is 360°. $w + x + y + z = 360$	
Complementary angles	The sum of complementary angles is 90°. These angles do not need to be together and form a right angle. If any two angles sum to 90° they are complementary.	
Supplementary angles	The sum of supplementary angles is 180°. These angles do not need to be together on a straight line. If any two angles sum to 180° they are supplementary.	
Vertically opposite angles	Vertically opposite angles are equal in size.	

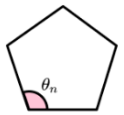
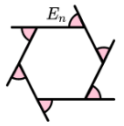
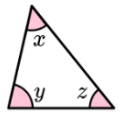
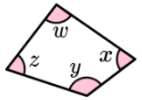
The sum of angles in a quadrilateral is 360°.

Type of quadrilateral	Angle property
Square / Rectangle	All four angles are equal to 90°
Parallelogram / Rhombus	Two pairs of opposite angles are equal
Kite / Arrowhead	One pair of equal angles
Trapezium	Two pairs of co-interior angles (see co-interior angles in parallel lines below)

Type of Angle	Description	Diagram
Acute angle	$0 \leq x^\circ < 90$	
Right angle	90°	
Obtuse angle	$90 < x^\circ \leq 180$	
Reflex angle	$180 < x^\circ \leq 360$	

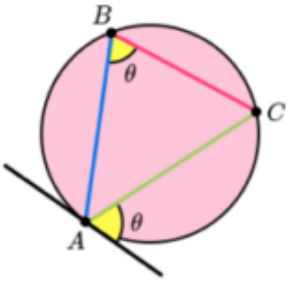
Corresponding angles	Corresponding angles are equal in size.	
Alternate angles	Alternate angles are equal in size.	
Co-interior angles	The sum of co-interior angles is 180°. $x + y = 180$	

Type of Triangle	Angle property	Diagram
Isosceles	The two base angles are equal	
Right angle	One angle is equal to 90°	
Equilateral	All three angles are equal to 60°	
Scalene	Three different angles (with no angle equal to 90°)	

Interior angles of polygons	The sum of interior angles of any polygon is equal to $180(n-2)$ for an n-sided shape.	
Exterior angles of polygons	The sum of exterior angles of any polygon is 360°.	
Angles in a triangle	The sum of angles in a triangle is 180°. $x + y + z = 180$	
Angles in a quadrilateral	The sum of angles in a quadrilateral is 360°. $w + x + y + z = 360$	

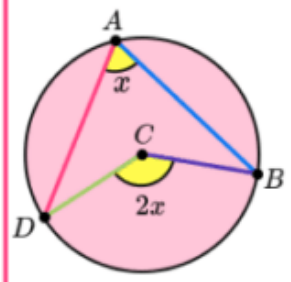
Circle Theorems

Alternate segment theorem



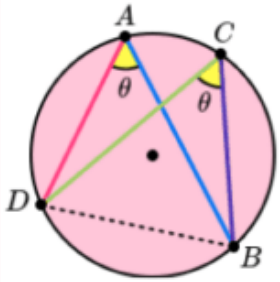
The angle that lies between a tangent and a chord is equal to the angle subtended by the same chord in the alternate segment.

Angle at the centre theorem



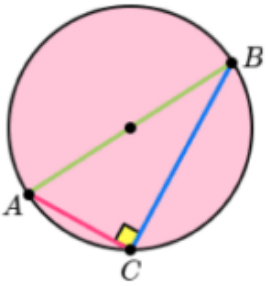
The angle at the centre is twice the angle at the circumference.

Angles in the same segment theorem



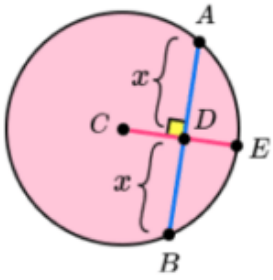
Angles in the same segment are equal.

Angles in a semicircle



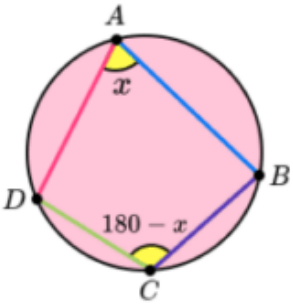
The angle in a semicircle is 90 degrees.

Chord of a circle



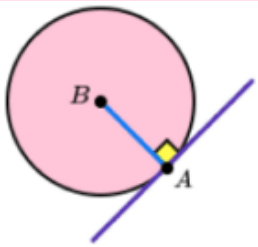
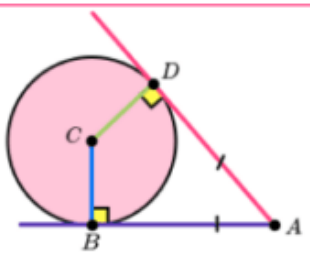
The perpendicular from the centre of a circle to a chord bisects the chord (splits the chord into two equal parts).

Cyclic quadrilateral



The opposite angles in a cyclic quadrilateral total 180°.

Tangent of a circle

Diagram A	Diagram B
	

A. The angle between a tangent and radius is 90 degrees.
B. Tangents which meet at the same point are equal in length.

Maths

Command word	Meaning
Calculate	A calculator and some workings will be needed
Change	Usually convert from unit to another, either using known metric conversions of the use of a conversion graph
Complete	Fill in missing values
Describe	Write a sentence that gives the features of the situation
Draw	Produce an accurate drawing
Draw a sketch off.../Sketch	Produce a drawing that does not have to be drawn to scale or a graph that is drawn without working out each coordinate
Expand	Remove brackets
Expand and simplify	Remove brackets and collect the like terms
Explain	Write a sentence of mathematical statement to show how you got to your answer or reached your conclusion
Express	Re-write in another form, some working may be needed
Factorise	Insert brackets by taking out common factors
Factorise fully	Inset brackets by taking out all the common factors
Find	Some working will be needed to get to the final answer
Give a reason	Some working will be needed to get to the final answer
Justify	Must be clear and accurate reasons
Prove	More formal than “show”, all steps must be present. In the case of a geometrical proof, reasons must be given
Show	All workings need to get a given answer or complete a diagram to show given information
Simplify	Simplify the given expression
Solve	Simplify the given expression
Write down	No working is needed

Maths - Calculator Features

×	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

Square numbers: 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144

Cube Numbers : 1, 8, 27, 64, 125

Prime numbers: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47...

Useful features on your calculator:

FACT: this express a number as a product of its prime factors

RATIO (menu 4): this will find missing values within equivalent ratios

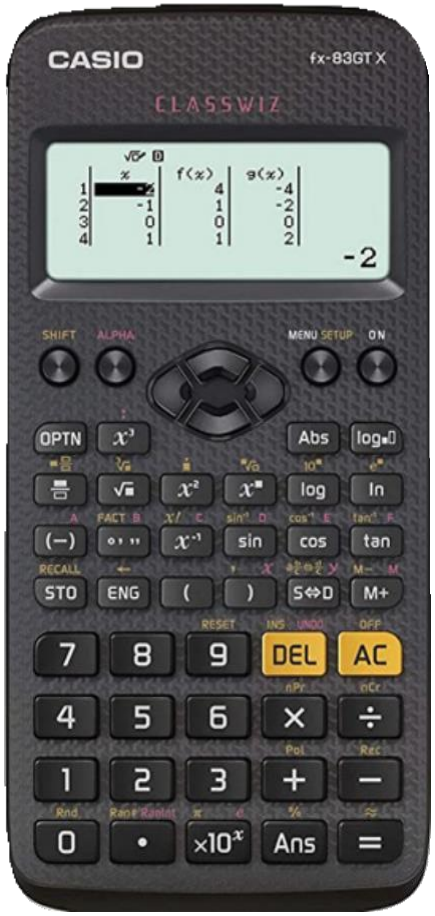
Table (menu 3): This is where you can generate values within a table- useful for plotting graphs and generating terms of a sequence

Statistics (menu 2): this will find all of the averages from a table of data

°'": This Is the time button and can do conversion between time units, as well as calculations with different times

Fraction button: can be used for ay calculations with fractions

S-D: Converts decimal answers to fractions and vice vera



Sparx Maths

- Homework will be set on Tuesday's and will be due on Tuesday morning at 7:00am
- You must complete 100% of the homework- if you have not got 100% of the questions correct, then you have not done your homework
- You will receive a merit for completion of your homework
- Bookwork must also meet the criteria outline in the table
- A bookwork score of 5/5 means you will receive a merit
- If your bookwork code is 4 or less, you will receive 1pt
- You need to bring your homework book to the first lesson after the Tuesday hand-in.
- If you complete one of the extra homework's- XP Boost or Target, you will receive another merit.- they must be 100% complete
- Sparx clinics will run every break time and lunchtime in the Arc, with a maths teacher available to support you. There will also be help available in homework club on Tuesday afternoon.
- It is your responsibility to seek help BEFORE the deadline, if you get stuck

Book work criteria	Marks
Due date and **title** written and underlined	1 mark
Bookwork codes written down	1 mark
All workings shown in the bookwork **SOME** workings = 1 mark **NO** workings = 0 marks	2 mark
Every question **marked**	1 mark

Science - How can I use the Periodic Table?

Group 1 – Alkali Metals

Group 7 – **Halogens**

Group 0 – **Noble gases**

Group number – tells you the number of **electrons** in an elements **outer** shell.

Elements in the **same group** have **similar properties**.

Element **symbol**
Element **name**

Mass Number = number of **protons** and **neutrons** added together.

Atomic / Proton Number = number of **protons** which is the same as the number of **electrons**.

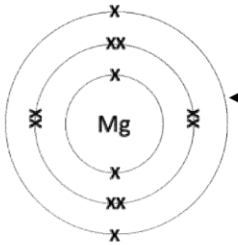
Neutrons = Mass number – Atomic number

relative atomic mass
atomic symbol
name
atomic (proton) number

Non-Metals

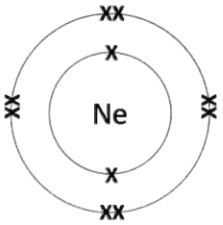
Transition Metals

1	2											3	4	5	6	7	0
																	4 He helium 2
7 Li lithium 3	9 Be beryllium 4											11 B boron 5	12 C carbon 6	14 N nitrogen 7	16 O oxygen 8	19 F fluorine 9	20 Ne neon 10
23 Na sodium 11	24 Mg magnesium 12											27 Al aluminium 13	28 Si silicon 14	31 P phosphorus 15	32 S sulfur 16	35.5 Cl chlorine 17	40 Ar argon 18
39 K potassium 19	40 Ca calcium 20	45 Sc scandium 21	48 Ti titanium 22	51 V vanadium 23	52 Cr chromium 24	55 Mn manganese 25	56 Fe iron 26	59 Co cobalt 27	59 Ni nickel 28	63.5 Cu copper 29	65 Zn zinc 30	70 Ga gallium 31	73 Ge germanium 32	75 As arsenic 33	79 Se selenium 34	80 Br bromine 35	84 Kr krypton 36
85 Rb rubidium 37	88 Sr strontium 38	89 Y yttrium 39	91 Zr zirconium 40	93 Nb niobium 41	96 Mo molybdenum 42	[97] Tc technetium 43	101 Ru ruthenium 44	103 Rh rhodium 45	106 Pd palladium 46	108 Ag silver 47	112 Cd cadmium 48	115 In indium 49	119 Sn tin 50	122 Sb antimony 51	128 Te tellurium 52	127 I iodine 53	131 Xe xenon 54
133 Cs caesium 55	137 Ba barium 56	139 La* lanthanum 57	178 Hf hafnium 72	181 Ta tantalum 73	184 W tungsten 74	186 Re rhenium 75	190 Os osmium 76	192 Ir iridium 77	195 Pt platinum 78	197 Au gold 79	201 Hg mercury 80	204 Tl thallium 81	207 Pb lead 82	209 Bi bismuth 83	[209] Po polonium 84	[210] At astatine 85	[222] Rn radon 86
[223] Fr francium 87	[226] Ra radium 88	[227] Ac* actinium 89	[267] Rf rutherfordium 104	[270] Db dubnium 105	[269] Sg seaborgium 106	[270] Bh bohrium 107	[270] Hs hassium 108	[278] Mt meitnerium 109	[281] Ds darmstadtium 110	[281] Rg roentgenium 111	[285] Cn copernicium 112	[286] Nh nihonium 113	[289] Fl flerovium 114	[289] Mc moscovium 115	[293] Lv livermorium 116	[293] Ts tennessine 117	[294] Og oganesson 118

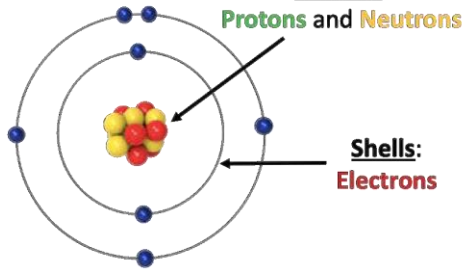


Magnesium (Mg) has **12 electrons** in total. It is in **group 2** so has 2 electrons in its **outer** shell. Mg's electronic configuration is 2,8,2.

Noble gases have a **full outer shell** of electrons E.g., Neon (Ne)



Subatomic Particle	Mass	Charge
Proton	1	+1
Neutron	1	0
Electron	Negligible	-1



Science - Experiments

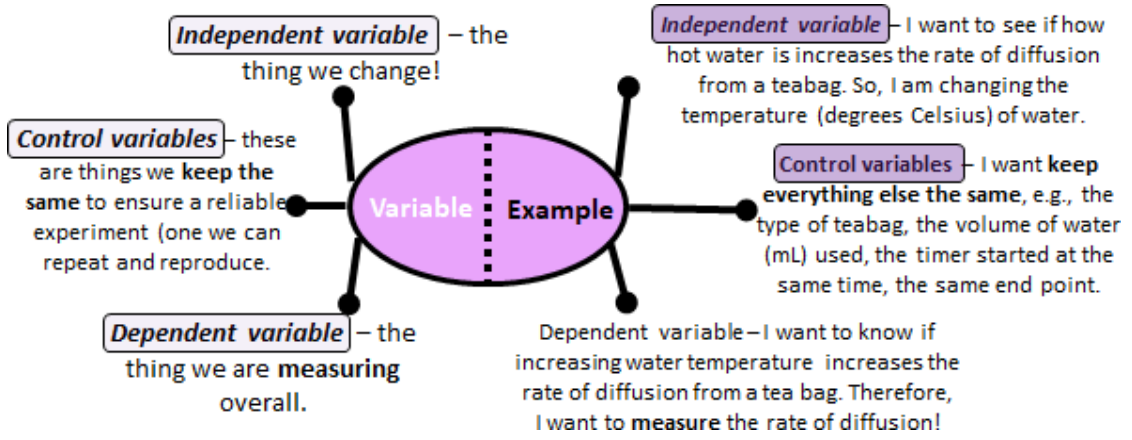
Key Terms	Description
Independent variable	The variable you change in an investigation
Dependent variable	The variable you measure in an investigation
Control variable	The variable you keep the same in an investigation
Hypothesis	A prediction of what will happen in an investigation
Reliability	We use control variables to ensure a reliable experiment
Reproducible	To re-do our experiment and get similar results due to a reliable method
Mean	Doing an experiment 3 times then dividing by 3 to get an average
Fair test	An experiment where only the independent variable changes.
Anomalous result	Result that does not fit with the rest of the data.

1. Designing and performing experiments

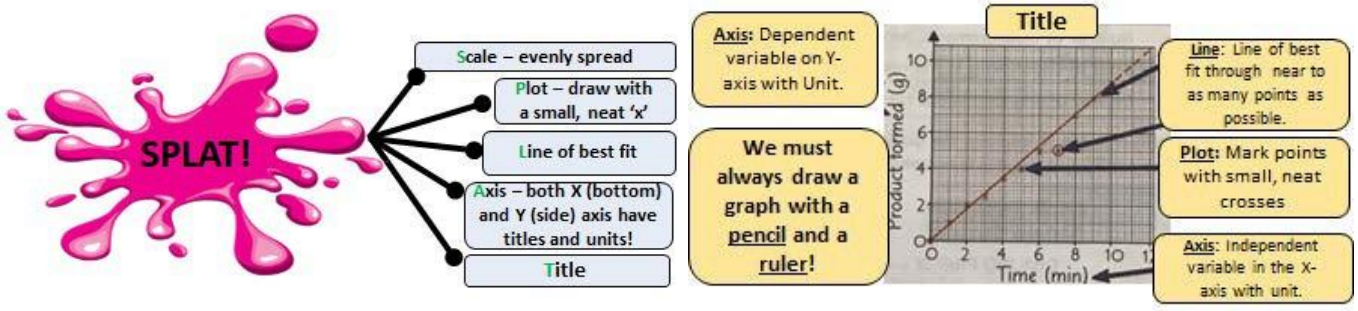
1. ***Repeatable*** – The **same** person gets the **same results** after repeating the experiment using the same method and equipment.
2. ***Reproducible*** – Similar results can be achieved by **someone else** or using a **different method**/piece of equipment.
3. ***Accurate*** – Results are close to the true answer
4. ***Precise*** – data is **close** to the **mean** (or the average!)

For data to be reliable, it must be **repeatable** and **reproducible**

2. The Variables



3. Presenting Data



Drawing conclusions from data:

1. State the relationship between the independent and dependent variable, e.g., 'as the time increases the product formed increases.'
2. Use statistics to support your answer. 'For example, at 10 minutes there was 50g of product, compared to 160g at 20 minutes'
3. Refer to the original hypothesis – does the data support this?

When evaluating think of the positives and negatives of the method (the validity - did they use enough controls? And of the results – were results reliable, accurate, reproducible?) and come to an overall conclusion.

Science - How can I use the Physics equation sheet? How can I use the Physics equation sheet?

Triple only equations

HT = Higher Tier only equations

kinetic energy = 0.5 × mass × (speed)^2	$E_k = \frac{1}{2} m v^2$
elastic potential energy = 0.5 × spring constant × (extension)^2	$E_e = \frac{1}{2} k e^2$
gravitational potential energy = mass × gravitational field strength × height	$E_p = m g h$
change in thermal energy = mass × specific heat capacity × temperature change	$\Delta E = m c \Delta\theta$
power = $\frac{\text{energy transferred}}{\text{time}}$	$P = \frac{E}{t}$
power = $\frac{\text{work done}}{\text{time}}$	$P = \frac{W}{t}$
efficiency = $\frac{\text{useful output energy transfer}}{\text{total input energy transfer}}$	
efficiency = $\frac{\text{useful power output}}{\text{total power input}}$	
charge flow = current × time	$Q = I t$
potential difference = current × resistance	$V = I R$
power = potential difference × current	$P = V I$
power = (current)^2 × resistance	$P = I^2 R$
energy transferred = power × time	$E = P t$
energy transferred = charge flow × potential difference	$E = Q V$
density = $\frac{\text{mass}}{\text{volume}}$	$\rho = \frac{m}{V}$

	thermal energy for a change of state = mass × specific latent heat	$E = m L$
	For gases: pressure × volume = constant	$p V = \text{constant}$
	weight = mass × gravitational field strength	$W = m g$
	work done = force × distance (along the line of action of the force)	$W = F s$
	force = spring constant × extension	$F = k e$
	moment of a force = force × distance (normal to direction of force)	$M = F d$
	pressure = $\frac{\text{force normal to a surface}}{\text{area of that surface}}$	$p = \frac{F}{A}$
HT	**pressure due to a column of liquid = height of column × density of liquid × gravitational field strength**	$p = h \rho g$
	distance travelled = speed × time	$s = v t$
	acceleration = $\frac{\text{change in velocity}}{\text{time taken}}$	$a = \frac{\Delta v}{t}$
	(final velocity)^2 – (initial velocity)^2 = 2 × acceleration × distance	$v^2 - u^2 = 2 a s$
	resultant force = mass × acceleration	$F = m a$
HT	**momentum = mass × velocity**	$p = m v$
HT	**force = $\frac{\text{change in momentum}}{\text{time taken}}$**	$F = \frac{m \Delta v}{\Delta t}$
	period = $\frac{1}{\text{frequency}}$	$T = \frac{1}{f}$
	wave speed = frequency × wavelength	$v = f \lambda$
	magnification = $\frac{\text{image height}}{\text{object height}}$	
HT	**force on a conductor (at right angles to a magnetic field) carrying a current = magnetic flux density × current × length**	$F = B I l$
HT	**$\frac{\text{potential difference across primary coil}}{\text{potential difference across secondary coil}} = \frac{\text{number of turns in primary coil}}{\text{number of turns in secondary coil}}$**	$\frac{V_p}{V_s} = \frac{n_p}{n_s}$
HT	**potential difference across primary coil × current in primary coil = potential difference across secondary coil × current in secondary coil**	$V_p I_p = V_s I_s$

Give
Give
Want

1. What does it give you? What does it want you to calculate?
2. Do you need to rearrange?
3. Do you need to convert?
4. Include the figures
5. Do you need to put it into standard form?
6. Do you need to include the unit?
7. Do you need to give the answer in significant figures?

Science - Homeostasis and response

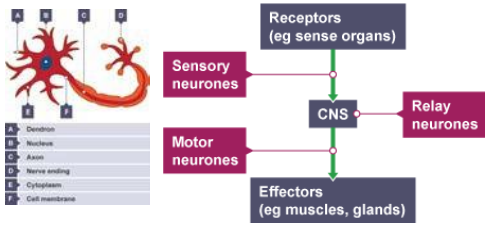
1. Key Terms	Description
Effector	The organ, tissue or cell that produces a response
Receptors	The organ, tissue or cell that produces a response
Reflex action	Automatic and rapid response to a stimulus
Stimulus	A change in environment that sets off a reaction in the nervous system, for example, light, heat, sound and smell.
Synapse	A gap at the junction between two nerve cells, which nerve signals must cross.
Gland	An organ or tissue that makes a substance for release, such as a hormone.
Hormone	Chemical messenger produced in glands and carried by the blood to specific organs in the body
Negative feedback	A mechanism where changes to conditions cause an action to reverse the change, to keep conditions stable
IVF	In vitro fertilization. This involves bringing the sperm and egg together to create an embryo, which is placed into the womb.

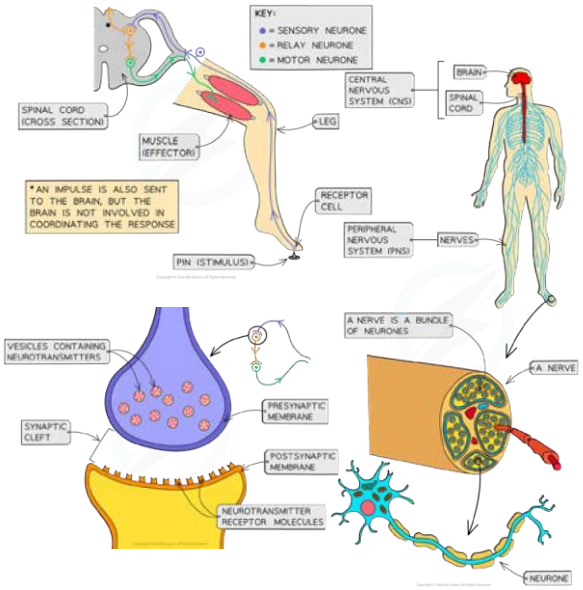
Further reading

SCAN ME

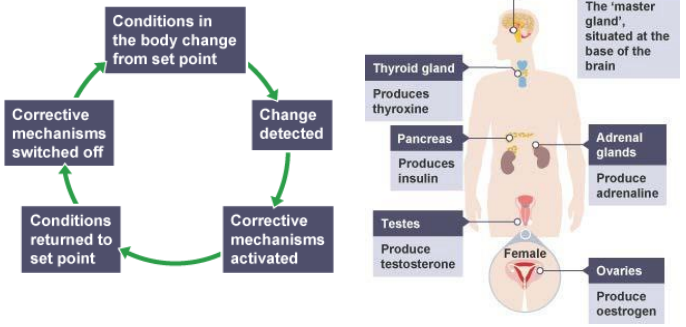
https://www.bbc.co.uk/bitesize/guides/zt2yxfr/revision/1

2. The Nervous system

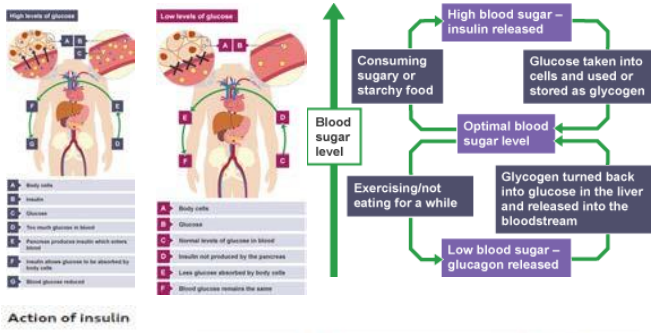




3. The endocrine system



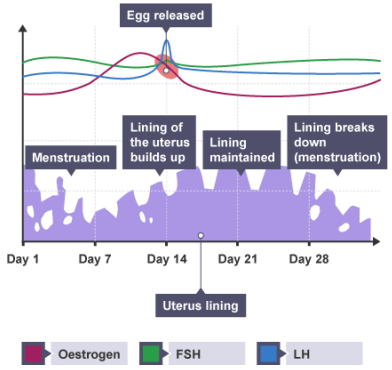
4. Glucose regulation and diabetes



Action of insulin

	Low glucose	High glucose
Effect on pancreas	Insulin not secreted into the blood	Insulin secreted into the blood
Effect on liver	Does not convert glucose into glycogen	Converts glucose into glycogen
Effect on blood glucose level	Increases	Decreases

5. Hormones in reproduction, contraception and infertility

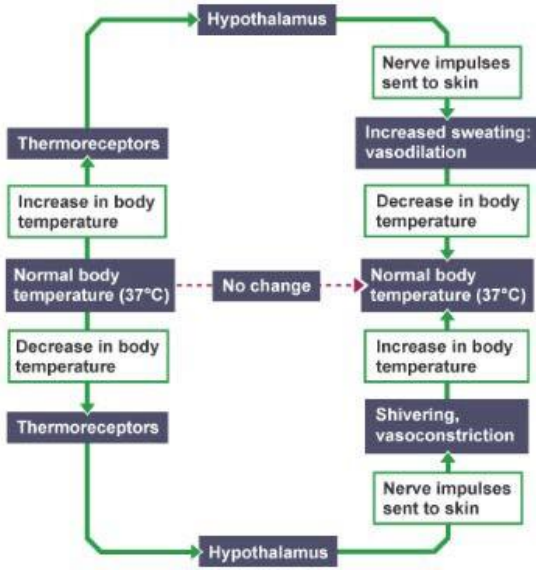


Hormone	Produced	Role
FSH (follicle stimulating hormone)	Pituitary gland	Causes an egg to mature in an ovary. Stimulates the ovaries to release oestrogen
Oestrogen	Ovaries	Stops FSH being produced (so that only one egg matures in a cycle). Repairs, thickens and maintains the uterus lining. Stimulates the pituitary gland to release LH.
LH (luteinising hormone)	Pituitary gland	Triggers ovulation (the release of a mature egg)
Progesterone	Ovaries	Maintains the lining of the uterus during the middle part of the menstrual cycle and during pregnancy.

Science - Homeostasis (Triple Only)

1. Key Terms	Description
Homeostasis	The maintenance of a constant internal environment
Vasodilation	The lumen of blood vessels becomes wider, blood flow increases.
Vasoconstriction	The lumen of blood vessels becomes narrower, blood flow decreases.
Thermoregulation	The maintenance of a constant core body temperature
Negative feedback loop	A response that reverses a change in the environment
Urea	Nitrogenous waste produced from the breakdown of proteins

2. Thermoregulation

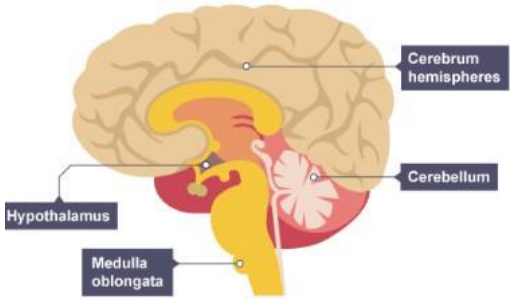


- Human core body temperature needs to be maintained at 37°C
- Too hot: vasodilation to increase heat loss from the skin
- Too cold: vasoconstriction to reduce heat loss from the skin

3. The brain

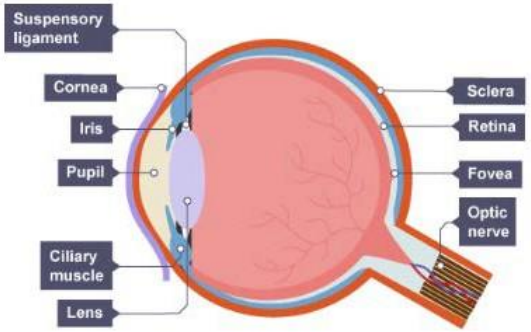
There are four main areas in the brain:

- The cerebrum (the outer layer is called the cerebral cortex), which is split into two hemispheres and is highly folded. It controls intelligence, personality, conscious thought and high-level functions, such as language and verbal memory.



- The cerebellum, which controls balance, co-ordination of movement and muscular activity.
- The medulla, which controls unconscious activities such as heart rate and breathing rate,
- The hypothalamus, which is the regulating centre for temperature and water balance within the body.

4. The eye



Structure	Function
Cornea	Refracts light - bends it as it enters the eye
Iris	Controls how much light enters the pupil
Lens	Further refracts light to focus it onto the retina
Retina	Contains the light receptors
Optic nerve	Carries impulses between the eye and the brain
Sclera	Tough white outer layer of the eye. It helps protect the eye from injury

- The retina contains rods and cones. Rods are useful for sensing dim light whilst cones allow colour vision
- The pupil reflex is a reflex action which prevents excessive light from entering the eye

Too light: the pupil constricts to limit light

Too dark: the pupil dilates to let more light in

- Muscles around the eye control the lens shape to allow us to focus on objects, as shown below.

Position	Ciliary muscles	Suspensory ligaments	Muscle tension	Lens shape	Refraction
Near	Contract	Slacken/loosen	Low	Fat/thicker	Light is refracted strongly
Distant	Relax	Stretched/tighten	High	Thin	Light is only refracted slightly

Science - Forces

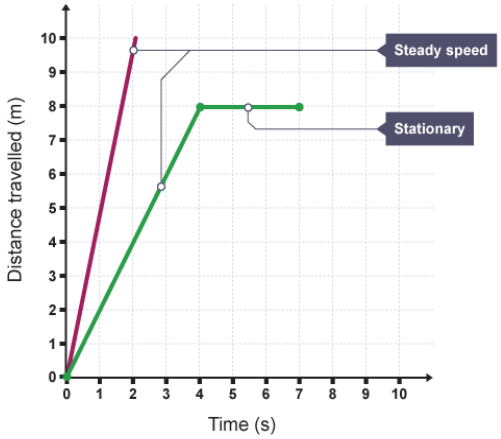
Key Terms	Description
Scalar	A quantity with only magnitude (size).
Vector	A quantity having direction as well as magnitude.
Distance	The total movement of an object.
Magnitude	The size of a physical quantity.
Speed	is the rate of change of distance - it is the distance travelled per unit time. Like distance, speed does not have an associated direction, so it is a scalar quantity.
Velocity	The velocity of an object is its speed in a particular direction.
Acceleration	Acceleration is the rate of change of velocity. It is the amount that velocity changes per unit time.
Displacement	Displacement is a vector quantity and includes the distance travelled in a straight line from start to finish, and the direction of the straight line.

$$s = v\,t$$

Some typical values for speed in metres per second (m/s) include:

Method of travel	Typical speed (m/s)
walking	1.5
running	3
cycling	6
car	13-30
train	50
aeroplane	250

In a distance-time graph, the gradient of the line is equal to the speed of the object. The greater the gradient (and the steeper the line) the faster the object is moving.

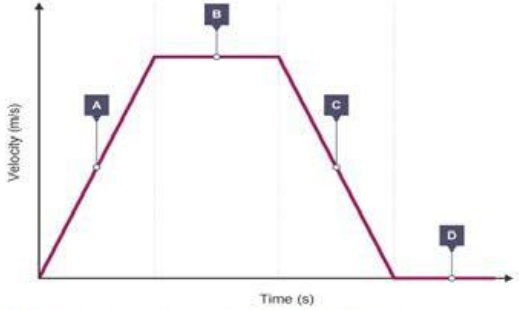


5.

Velocity-time graphs

Determining acceleration

If an object moves along a straight line, its motion can be represented by a velocity-time graph. The gradient of the line is equal to the **acceleration** of the object.



The table shows what each section of the graph represents:

Section of graph	Gradient	Velocity	Acceleration
A	Positive	Increasing	Positive
B	Zero	Constant	Zero
C	Negative	Decreasing	Negative
D ($v = 0$)	Zero	Stationary (at rest)	Zero

Acceleration

Acceleration is the rate of change of velocity. It is the amount that velocity changes per unit time.

The change in velocity can be calculated using the equation:

change in velocity = final velocity - initial velocity

$$\Delta v = v - u$$

The average acceleration of an object can be calculated using the equation:

$$acceleration = \frac{change\ in\ velocity}{time\ taken}$$

$$\alpha = \frac{\Delta v}{t}$$

This is when:

- acceleration (α) is measured in metres per second squared (m/s^2)
- change in velocity (Δv) is measured in metres per second (m/s)
- time taken (t) is measured in seconds (s)

If an object is slowing down, it is decelerating (and its acceleration has a negative value).

This equation applies to objects in uniform acceleration:

(final velocity)^2 - (initial velocity)^2 = 2 × acceleration × distance

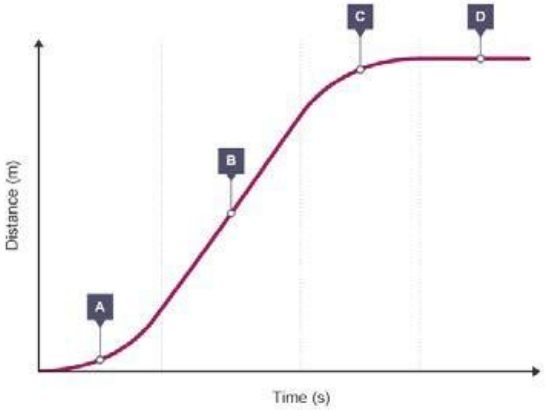
$$v^2 - u^2 = 2\,a\,s$$

Science - Forces

The speed of an object can be calculated from the gradient of a distance-time graph.

Distance-time graphs for accelerating objects - Higher

If the speed of an object changes, it will be **accelerating** or **decelerating**. This can be shown as a curved line on a distance-time graph.



The table shows what each section of the graph represents:

Section of graph	Gradient	Speed
A	Increasing	Increasing
B	Constant	Constant
C	Decreasing	Decreasing
D	Zero	Stationary (at rest)

If an object is accelerating or decelerating, its speed can be calculated at any particular time by:

- drawing a **tangent** to the curve at that time

Further reading

https://www.bbc.co.uk/bitesize/topics/ztmttv4

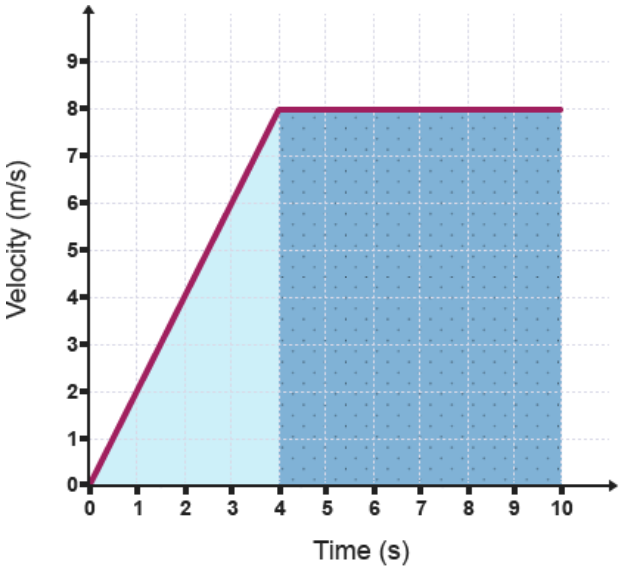
SCAN ME

Calculating displacement - higher

The displacement of an object can be calculated from the area under a velocity-time graph.

The area under the graph can be calculated by:

- using geometry (if the lines are straight)
- counting the squares beneath the line (particularly if the lines are curved)

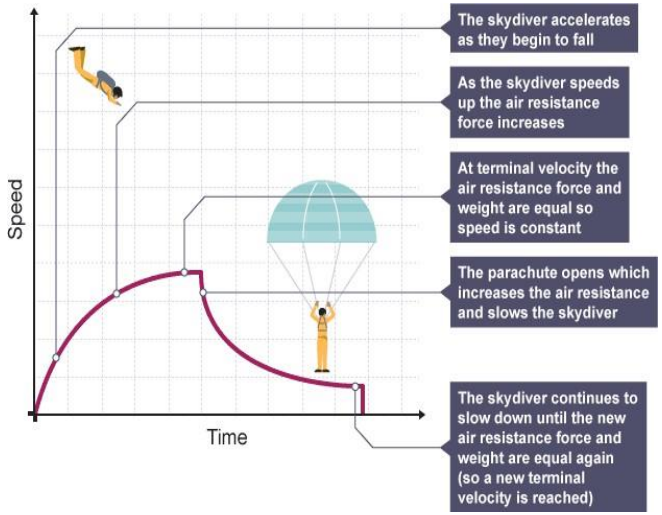


Here, the displacement can be found by calculating the total area of the shaded sections below the line.

Terminal velocity

Near the surface of the Earth, any object falling will have an acceleration of about 9.8 metres per second squared (m/s^2). Objects falling through a fluid eventually reach terminal velocity. At terminal velocity, the object moves at a steady speed in a constant direction because the resultant force acting on it is zero. For exrample, a skydiver falling spread-eagled through the air reaches a maximum speed of 53m/s.

The diagram shows what happens to the speed of a skydiver from when they leave the aircraft, to when they reach the ground after their parachute opens.



Science - Forces

1. Key Terms	Description
Centre of mass	The point representing the mean position of the matter in a body.
Free body diagram	A simplified drawing of an object or system showing the forces acting on it. The forces are shown acting away from the centre of a box or dot
Gravity	A non-contact force All objects with mass produce a gravitational field. The more mass an object has, the greater its gravitational field will be.
Mass	The amount of matter an object contains. Mass is measured in kilograms (kg) or grams (g).
Weight	The amount of matter an object contains. Mass is measured in kilograms (kg) or grams (g).
Newton	The unit of force.
Force	A push, pull or a twist
Reaction force	Force exerted in the opposite direction to an action force.
Resultant force	The single force that could replace all the forces acting on an object, found by adding these together. If all the forces are balanced, the resultant force is zero.
Momentum	The product of mass and velocity. It is a vector quantity.
Thinking distance	This is the distance a vehicle travels in the time it takes for the driver to apply the brakes after realising they need to stop.
Braking distance	This is the distance a vehicle travels in the time after the driver has applied the brake.

2. Newton's first law

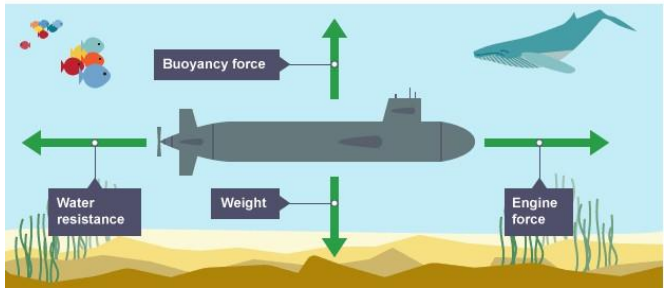
According to Newton's First Law of motion, an object remains in the same state of motion unless a resultant force acts on it. If the resultant force on an object is zero, this means:

- a stationary object stays stationary
- a moving object continues to move at the same velocity (at the same speed and in the same direction)

Inertia - Higher

The tendency of an object to continue in its current state (at rest or in uniform motion) is called inertia

Forces on a submarine



3. Newton's Second Law Force, mass and acceleration

Newton's Second Law of motion can be described by this equation:

resultant force = mass × acceleration

F=m a

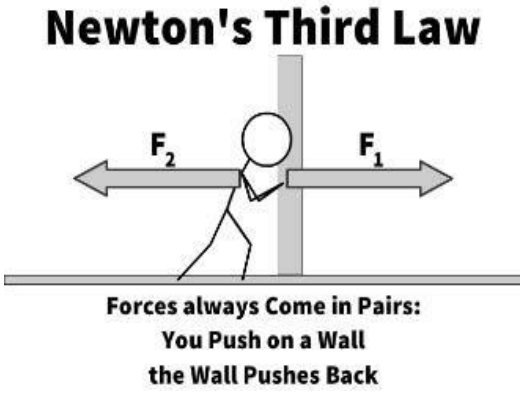
This is when:

- force (F) is measured in newtons (N)
- mass (m) is measured in kilograms (kg)
- acceleration (a) is measured in metres per second squared (m/s^2)

4. Newton's Third Law

According to Newton's Third Law of motion, whenever two objects interact, they exert equal and opposite forces on each other.

This is often worded as 'every action has an equal and opposite reaction'. However, it is important to remember that the forces act on two different objects at the same time.



5. Momentum

Momentum is the product of mass and velocity. Momentum is also a vector quantity – this means it has both a magnitude and an associated direction.

Calculating momentum

Momentum can be calculated using the equation:

momentum = mass × velocity

p=m v

This is when:

- momentum (p) is measured in kilogram metres per second (kg m/s)
- mass (m) is measured in kilograms (kg)
- velocity (v) is measured in metres per second (m/s

Science - Forces

1. Key Terms	Description
Deformation	A change in shape
elastic	Deformation is not reversed when the force is removed – the change in shape is permanent.
inelastic	Deformation is not reversed when the force is removed – the change in shape is permanent.
Extension	When an object increase in length
Compression	When an object such as a spring decreases in length
Spring constant	A measure of the stiffness of a spring up to its limit of proportionality or elastic limit.
Hooke's Law	The extension of a spring is directly proportional to the force applied, provided that the limit of proportionality is not exceeded.
Limit of proportionality	The point beyond which Hooke's law is no longer true when stretching a material

2. Energy stored in a spring

Work is done when a spring is extended or compressed. Elastic potential energy is stored in the spring. Provided inelastic deformation has not happened, the work done is equal to the elastic potential energy stored.

The elastice potential energy stored can be calculated using the equation:

elastic potential energy = 0.5 x spring constant x

$$E_e = \frac{1}{2} k e^2$$

This is when:

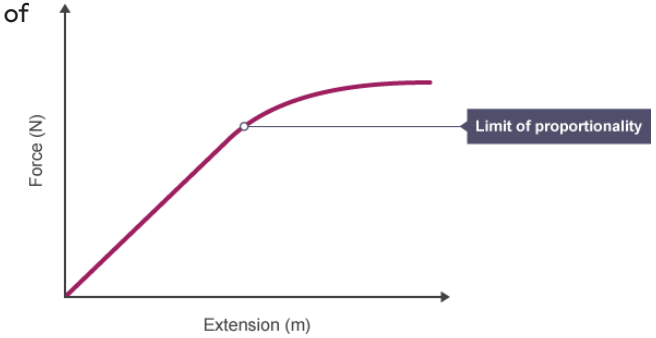
- elastic potential energy (E_e) is measured in joules (J)
- spring constant (k) is measured in newtons per metre (N/m)
- extension (e), referring to the increase in length, is measured in metres (m)

3. Force extension graphs

$$F = k e$$

Linear extension and elastic deformation can be seen below the limit of proportionality.

Non-linear extension and inelastic deformation can be seen above the limit of proportionality. The limit of
proportionality is also described as the 'elastic limit'.
The gradient of a force extension graph before the limit of



4. Required practical - how forces affect the extension of a spring

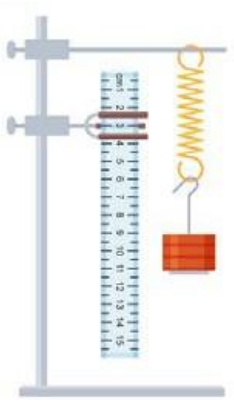
Investigate the relationship between force and extension for a spring.

There are different ways to investigate the relationship between force and extension for a spring. In this practical activity it is important to:

- measure and record length accurately
- measure and observe the effect of force on the extension of springs
- collect the data required to plot a force-extension graph

5. Aim of the experiment

To investigate the relationship between force and extension for a spring



1. Secure a clamp stand to the bench using a G-clamp or a large mass on the base
2. Use bosses to attach two clamps to the clamp stand
3. Attach the spring to the top clamp, and a ruler to the bottom
4. Adjust the ruler so that it is vertical, and with its zero level with the top of the spring
5. Measure and record the unloaded length of the spring
6. Hang a 100g slotted mass carrier - weight 0.98 newtons (N) from the spring. Measure and record the new length of the spring
7. Add a 100g slotted mass to the carrier. Measure and recod the new lenght of the spring
8. Repeat step 7 until you have added a total of 1000g

6. Further reading

SCAN ME

https://www.bbc.co.uk/bitesize/guides/zgv797h/revision/1

Science – Forces (Triple only)

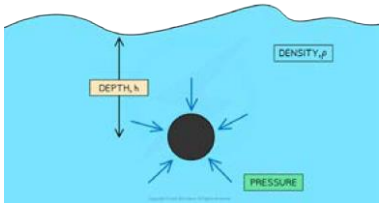
Key Terms	Description
Pressure	Force exerted over an area. The greater the pressure, the greater the force exerted over the same area.
Moment	A turning effect of a force
Pivot	A point around which something can rotate or turn

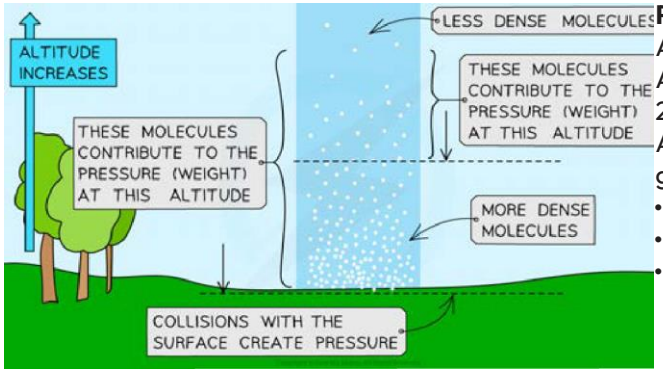
$$pressure = \frac{force\ normal\ to\ a\ surface}{area\ of\ that\ surface}$$

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

pressure = height of column × density of the liquid × gravitational field strength

$$p = h \rho g$$

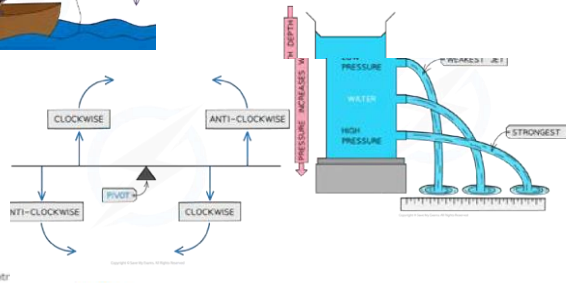


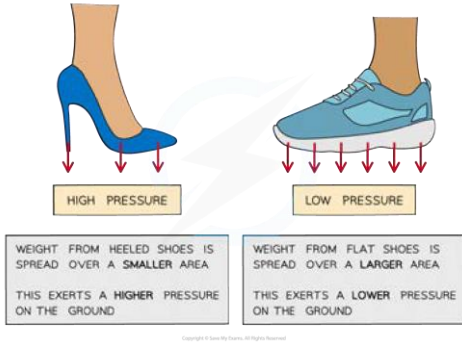


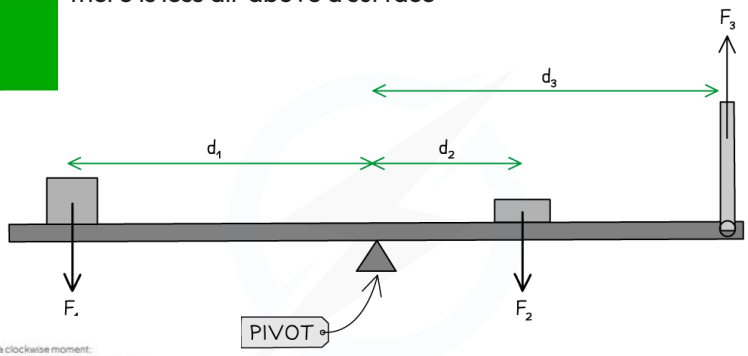
Pressure

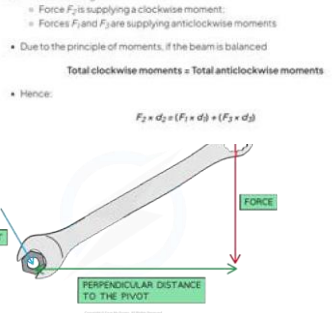
Air molecules colliding with a surface cause atmospheric pressure. Atmospheric pressure at sea level is about 101,000 Pa (101 kPa) but just 27,000 Pa (27 kPa) at the cruising altitude of a passenger plane. Atmospheric pressure decreases as the height of a surface above ground level increases. This is because, as the altitude increases:

- the number of air molecules decreases
- the **weight** of the air decreases
- there is less air above a surface

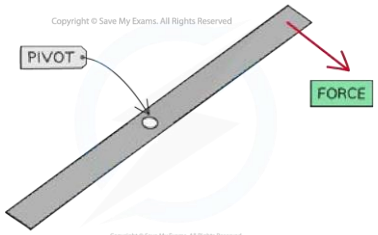


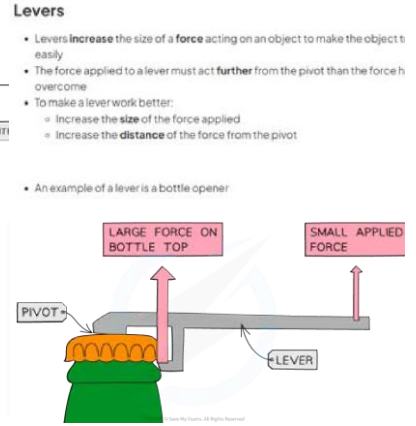


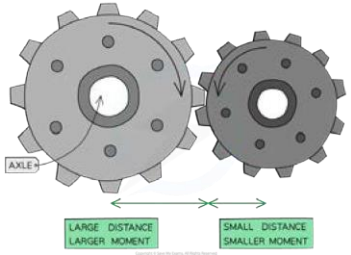




$$F_2 \times d_2 = F_1 \times d_1 + F_3 \times d_3$$







Science - Magnetism

1. Key Terms	Description
Magnet	An object capable of exerting a magnetic force
Induced magnet	A temporary magnet, made from a magnetic material placed in a magnetic field. The induced magnetism is lost when moved out of the magnetic field
Magnetic field	Area surrounding a magnet that can exert a force on magnetic materials
Transformer	An electrical device that increases, or decreases, the potential difference (voltage) of an alternating current.
Solenoid	A straight coil of wire which can carry an electric current to create a magnetic field.
Motor effect	The effect where a force us exerted on a wire carrying a current in a magnetic field

2. Magnetic fields

A magnet can exert a force on another nearby magnet. Magnets have two poles:

- a north pole
- a south pole

The magnetic force is strongest near the magnet's poles.

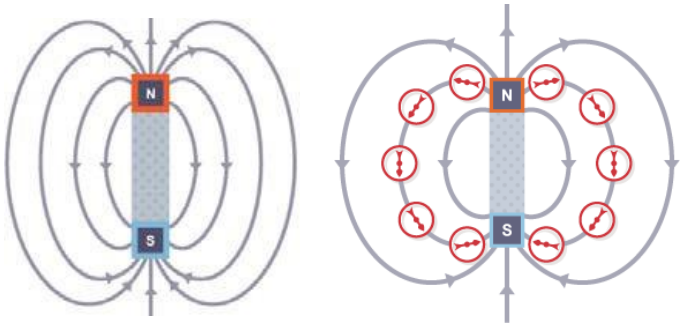
The rules of magnetism

Two magnets will either attract or repel each other in the following way:

- like poles (N-N or S-S) repel
- unlike poles (N-S or S-N) attract

Magnetic forces are non-contact forces - this means that magnets affect each other without touching.

3. Detecting and drawing magnetic fields



4. Permanent and induced magnetism

A permanent magnet is often made from a magnetic material such as iron. A permanent magnet always causes a force on other magnets, or on magnetic materials. Key features of a permanent magnet:

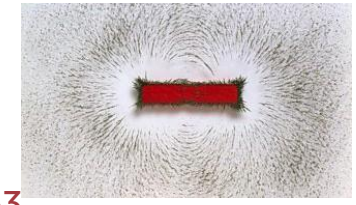
- it produces its own magnetic field
- the magnetic field cannot be turned on and off - it is there all the time

Bar magnets and horseshoe magnets are examples of permanent magnets.

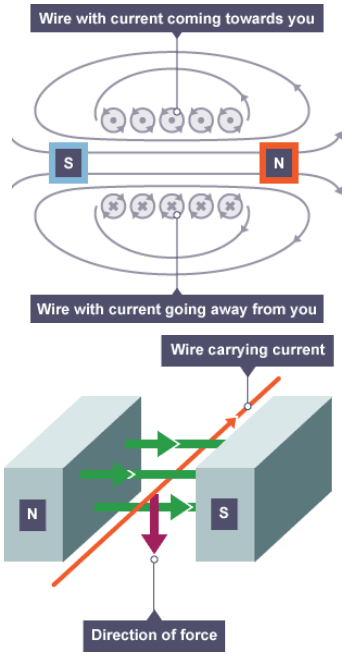
Unlike a permanent magnet, an induced magnet only becomes a magnet when it is placed in a magnetic field. The induced magnetism is quickly lost when the magnet is removed from the magnetic field.

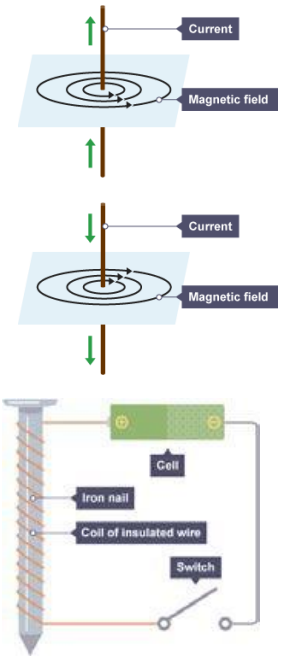
The iron filings in the image become induced magnets when they are near the bar magnet. Like all induced magnets:

- they are only attracted by other magnets, they are not repelled
- they lose most or all of their magnetism when they are removed from the magnetic field
- .



5. Electromagnets





Higher only

force = magnetic flux denstiy x current x length

$F = BIl$

This is when:

- F is force in newtons (N)
- B is magnetic flux density (magnetic field strength) in tesla (T)
- I is current in amperes - also referred to as amps - (A)
- l is length in metres (m)

6. Further reading

https://www.bbc.co.uk/bitesize/topics/zwkww6f

Science - Quantitative Chemistry (Triple only)

1. Key Terms	Description
Conservation of mass	No atoms are lost or gained in a chemical reaction
Reactants	Substances found on the left side of a chemical equation
Products	Substances found on the right side of a chemical equation
Uncertainty	A measure of how precise a value is
Concentration	A measure of the number of particles dissolved in a certain volume of solution
HT only – Avogadro's constant	6.02×10^{23}. the number of particles in 1 mole of a substance
HT only – limiting reactant	The reactant which is used up in a reaction
HT only – reactant in excess	The reactant which is left over at the end of a reaction

2. Conservation of mass

- No atoms are lost or gained in a chemical reaction
- Equations are balanced so that there is the same number of atoms of each element in the reactants as there is in the products

2Cu + O 2 -> **2**CuO

3.Chemical cells

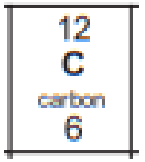
Two different metals are connected using an alectrolyte. The greater the difference in reactivity between the two metals the greater the potential difference produced.

Expensive, rechargeable versions are available which are more sustainable. However most are disposed in landfill at the end of their life.

	Magnesium -2.37	Zinc -0.76	Copper +0.34
Magnesium	0.00 V	1.61 V	+2.71
Zinc	-1.61 V	0.00 V	+1.10 V
Copper	2.71 V	-1.10 V	0.00 V

4. Relative formula mass and percentage by mass

- The relative formula mass (Mr) is the sum of the mass numbers of the atoms found in the formula.



Example: Calculate the relative formula mass (Mr) of carbon dioxide (CO2)

12 + (16 X 2) = 44

- Percentage by mass is calculated by dividing the atomic mass by the formula mass and then multiplying by 100.

Example: Calculate the percentage by mass of carbon in carbon dioxide (CO2)

(12 ÷ 44) x 100 = 27.27%

5. Concentration

$$concentration\ in\ g/dm^3 = \frac{mass\ of\ solute\ in\ g}{volume\ in\ dm^3}$$

Example: 8g of sodium hydroxide is dissolved in 2dm3 of water. Calculate the concentration of the solution.

$$concentration = \frac{mass\ of\ solute\ in\ g}{volume\ in\ dm^3}$$

$$concentration = \frac{8\ g}{2\ dm^3}$$

$$concentration = 4\ g/dm^3$$

6. Mass changes in a reaction

- When a reactant of product is a gas, the reactants can appear to have gained of lost mass.

Example: magnesium reacting with oxygen to make magnesium oxide

2Mg(s) + O_2(g) -> **2**MgO(s)

7. HT only – moles

1 mole is equal to 6.02 × 1023 particles.

Important equations

- Number of moles = mass (g) ÷ formula mass
- Concentration (mol/dm3) = moles ÷ volume (dm3)

A chemical equation tells you the ratio in which the substances react.

$Mg + 2HCl \rightarrow MgCl_2 + H_2$

1 mole of magnesium reacts with 2 moles of hydrochloric acid to make 1 mole of magnesium chloride and 1 mole of hydrogen.

Example question: If 12g of magnesium reacts completely with hydrochloric acid, what mass of hydrochloric acid reacts?

1. How many moles of magnesium react?

12 ÷ 24 = 0.5 moles of magnesium

2. How many moles of hydrochloric acid reacts?

2 X 0.5 = 1 mole of hydrochloric acid

3. What is the mass of 1 mole of hydrochloric acid?

1 X 36.5 = 36.5g of hydrochloric acid

Science - Triple Science students only

1. How to approach 6 mark questions in Science - Homeostasis

Question	Describe how an organism is able to respond to_____
Info	You could be askedthis question for any stimulus for any organism. Past examples that have come up in exams include: • Sharp point touching the skin • Mouse responding to a dropped pin • Knee jerk reflex • Touching a hot plate • Mouse detecting and responding to food To answer this question, you will need to do the following: • Receptor detecting stimulus • Generating impulse • Impulse travelling along sensory neurone • Chemical transmitter difussing across the synapse • Impulse generated on relay neurone • Impulse moves to motor neurone • Identifying the effector that brings about the response (muscle or gland) • Describing the response
Top tip	The examiner is looking for an answer in a logical sequence Receptor ➔ Sensory ➔ Synapse ➔ Relay ➔ Motor ➔ Effector Before you begin write a plan that includes just the first letter for each of these words to help you structure your answer. R, S, S, R, M, E Other key words to use are synapse and electrical impulse
Model answer	Describe how an organism is able to respond to a sharp pin touching the skin. The sharp pin is detected by pressure receptors in skin, this generates an electrical impulse which travels along a sensory neurone, This impulse causes neurotransmitters to diffuse across the synapse to generate another impulse in the relay neurone. The impulse travels to the motor neurone to the effector. The effector is a muscle which contracts to move the hand away from the pin.
Practice	1. Learn and practice the model answer above. 2. Prepare and learn model answers to describe how an organism responds to a dropped pin, knee jerk reflex, and touching a hot plate.

2. How to approach 6 mark questions in Science - Forces

Question	Explain you would determine the centre of mass of a piece of card. Explain how you could check that the centre of mass point is accurate. Explain when an object will topple over etc.
Info	At least one of these questions is likely to come up. The examiner is going to be looking for a clear answer written in a logical sequence.
Top tip	Be careful that you use key words/phrases accurateky (these are in bold in your model answers below).
Model answer	Explain how you would determine the centre of mass of a piece of card. Place three holes in the card, with each hole in a different place and close to the edge of the card. Then place a pin through the first hole and hold the pin in place using a boss in a clamp stand to suspend the card. Tie a weight to a piece of string and suspend this string from the same pin. This is a plumb line. Draw a line on the card marking where the string was. Repeat this fro the other two holes. The point the lines intersect is the centre of mass.
Model answer	Explain how you could check the centre of mass point is accurate. Put another hole in the card near the edge. Suspend it using a pin and use a string on a weight to create a plumb line. Draw a line on the card marking where the string was. If this line intersects the centre of mass then the centre of mass is accurate.
Model answer	Explain when an object will topple over. Centre of mass is the point at which the weight of an object acts through. An object will topple over when the centre of mass falls outside the base of the object.
Practice	1. Learn and practice the model answer above.

Science - Clubs and Reading

Post 16 GCSE transition activities to explore:

1. AQA | Subjects | Science | AS and A-level

2. Undergraduate Science Courses (thecompleteuniversityguide.co.uk)

3. The official website of the Nobel Prize - NobelPrize.org

4. National Geographic

5. Discover | Natural History Museum (nhm.ac.uk)

6. NASA

7. http://learn.genetics.utah.edu/

8. Science_A_Level_skills_pack.pdf (oup.com)

9. Summer Start for A-Level Chemistry – YouTube

10. Why is biodiversity so important? - Kim Preshoff | TED-Ed

11. KS5 Physics Transition workbook 2019.docx - Google Drive

Post 16 GCSE inspirational journals to explore:

1. Physics World
2. New Scientist

Art

Exam Paper out July 2024

Choose your Question.
There are 3 questions. Each question has three artist, craftspeople or designers. Choose a question that interests you.

Brainstorm.
Choose a question and create a brainstorm across a double page. This can include images and drawings. The more detailed you make this the more refined your idea will be.

Resource Material.
Collect resource materials that link to your brainstorm. This can be collaged images and information from newspapers and magazine, photographs and drawings. It should be a mixture of all of these and it should be annotated telling me why you have chosen this and how it relates to the question.

Brainstorm & Resource Materials July 2024

Second Brainstorm
Select a word or phrase from the first brainstorm. This is the area that you want to explore, to develop your ideas. This will be the real starting point for your PPE.

Completion of Resource material and initial idea development September 2024

More resource materials that link to your second brainstorm. This can be collaged images and information from newspapers and magazine, photographs and drawings. It should be a mixture of all of these and it should be annotated telling me why you have chosen this and how it relates to the question.

Development of Ideas
Start to develop your ideas by doing drawings from your resource materials. These drawings should be considered and you might start to experiment with different materials and techniques. The more ideas the more marks!

Artist Research.
There will be 3 named artists, craftspeople or designers in the question. Look at the work of all 3, print one image from each and write your opinion about their work.

Artist Research x3
You will have some ideas and now need to find your own artists that link to your work. Do a double page spread on them. Write and tell me why you have selected them and how they relate to your work.

Contextualisation.
What will be the meaning, message or idea behind your idea?

Development & Contextualisation September 2024

More Idea development
You will draw ideas inspired by your resource materials and the artists that you have made links with.

Experimentation. October 2024

Experimentation of Materials.
You will have started this when you initially recorded your ideas, however you should be ready to select one idea, draw it onto A4, split in half and experiment with two different materials such as acrylic and watercolour. Write and say which you prefer and why. How does it relate to your artist?If you are doing 3D you will create small versions of the ceramic piece or samples of the textile piece.

Final Composition / Idea.
You will know from your idea development what you want to do as the final outcome / piece. If it is a painting draw the final composition onto A3 and paint it as a mini version of what you will do in the exam. If it is 3D make a smaller model. You are showing the examiner your intentions.

Final Idea. October 2024

Computer Science - Computational thinking, algorithms & programming

2. File Handling in Python

`file = open("myfile.txt","w")`	Open the file for writing
`file.write("Hello Poltair \n")`	Write to the file
`file.close()`	Close the file
`file = open("myfile.txt","a")`	Open file to append
`file.write("Have a nice day \n")`	Write to the file (adds to the next line)

3. Testing code

Choosing data to test with:

Valid data - sensible, possible data that the program should accept and be able to process

Boundary data - valid data that falls at the boundary of any possible ranges. It should not give an error.

Invalid (erroneous) data - data that the program cannot process and should not accept. You should get an error!

Test input
Name:

Test Number	Input	Expected
1	Joe	No error
2	X	Error
3	12345	Error

Error Types

Syntax	Writing it wrong eg: `PRINT("Hello)` instead of `print("Hello")`
Logic	Designing it wrong eg: `Sum = 12/4` instead of `Sum = 12+4` The IDE will not give you an error message!

Iterative testing is carried out while a program is being developed. It is repeated until the code works as intended.

Final (terminal) testing is carried out when all parts of the code are complete. The program is tested as a whole to ensure that it functions as it should.

1. Key Terms	Description
Iterative Testing	as the program is being developed
File Open	`f = open("myFile.txt")`
SQL	Structured Query Language is used to work with databases
Linear Search	Search the list one element at a time. Works on an unsorted list. Can be slow.
Terminal Testing	at the end of the writing process. More formal and documented
File Close	Always close after opening! `f.close()`
Ethical	Does the software cause harm. What are the rules that govern decisions?
Binary Search	On a Sorted list. Find centre. Look higher or lower for the item. Splitting until found. Faster than linear.
Selecting test data	Using data that is boundary, normal and invalid
File Read	`f= open("myFile.txt", "r")` print(f.read())
Legal & Privacy	Data Protection Act 2018 Computer Misuse Act 1990 Copyright Licences
Bubble Sort	Compare items with the next one. If the first value is bigger, swap the positions of the two values. Repeat passes until sorted.
Maintainability	How to write code so it is clear what is happening, so others can understand

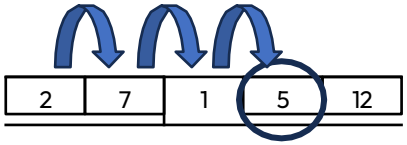
File Write	Append:
	`f = open("demofile2.txt", "a")`
	Overwrite/create:
	`f = open("demofile3.txt", "w")`

Environmental	How are computing devices made? How are they disposed of?
Merge Sort	Divide and conquer. Divide list into two until all the items are separated. Then order in pairs until list sorted.
Syntax and Logic errors	Writing it wrong or designing it wrong
IDE	The integrated development environment. Useful editor for syntax errors, colours and runtime
Cultural	What is the impact on people who use computers?
Insertion Sort	Each item is checked in order and inserted in the correct place until the end of the list

Computer Science - Computational thinking, algorithms & programming

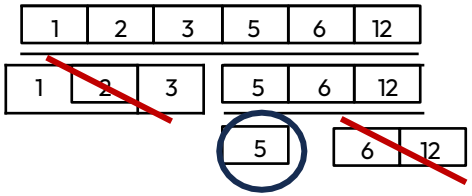
4. Searching and sorting data

Linear search



Starting at the beginning of the data set, each item of data is examined until a match is made. Once the item is found, the search ends. Can be inefficient on large lists, but the list doesn't need to be sorted first.

Binary search



More efficient algorithm than a linear search. Works on an ordered (sorted) list, breaking it into 2 parts until the number is found.

Sorting algorithms

Bubble Sort 	Compare the first value in the list with the next one up. If the first value is bigger, swap the positions of the two values. Each pass is a better sorted list but needs a final pass to check.
Merge sort 	The list is repeatedly divided into two until all the elements are separated individually. Pairs of elements are then compared, placed into order and combined. The process is then repeated until the list is recompiled. Complex to code but efficient. Divide and Conquer!
Insertion Sort 	The list is repeatedly divided into two until all the elements are separated individually. Pairs of elements are then compared, placed into order and combined. The process is then repeated until the list is recompiled. Complex to code but efficient. Divide and Conquer!

5. Structured Query Language

SQL is a language used to manage data in a database

Database	An application which has linked tables of data Eg Microsoft Access

SELECT FROM WHERE	Allows you to choose data to display form a table:
	`SELECT * FROM Students WHERE First_Name = "Fred"`
	This would output all the data from the students whose name is Fred
	`SELECT Last_Name, Telephone`
	`FROM Students WHERE`
	`First_Name = "Fred"`
	This would output the last name and telphone number form all the students whose name is Fred

Using Booleans with SELECT query	You can use NOT, AND and OR in your SELECT query. This would output all the student data for students whose last name was either Smith or Jones. `SELECT * FROM Students WHERE Last_Name= "Smith" OR "Jones"`
Using Operators	Mathematical operators can also be used – here to output the names of all over 16. `SELECT First_Name, Age FROM Students WHERE Age > 16`
ORDER	You can specify the order of the output: `SELECT * FROM Customers ORDER BY Country;`

Computer Science - Computational thinking, algorithms & programming

6. Maintainability

Ways to make your code more maintainable:

- Using Sub Programs
- Naming conventions
- Indentation
- Commenting

7. Programming Fundamentals - Data Types and casting

Integer	Whole number eg 13 `myAge = int(age)`
Real	Number with decimal places eg 105.7 `myHeight = float(height)`
String	More than one character, number or spaces "PL25 4BZ" myName = str(name)
Character	One letter or number (but you cannot do maths with a char) Eg A or 6
Boolean	TRUE or FALSE

Array/List	One Dimensional Array
	`Names = ["John","Paul","George"]`
	`print(Names[0])`
	Two-Dimensional Array
	`TicTacToe = [[1,2,3],[4,5,6],[7,8,9]]`
	`TicTacToe[1][1] = 5`
	`TicTacToe[0][2] = 3`
	`TicTacToe[2][2] = 9`

1	2	3
4	5	6
7	8	9

8. Constructs

Sequence — Instructions executed in order

Selection

```
if day == "Monday":
    print("The start of a brilliant week!")
    day_number = 1
elif:
    print("Halfway through the week!")
else:
    print("Have a great day")
```

Iteration

```
# display a count from 1 to 10
count = 1
while count <= 10:
    print(count)
    count = count+1
# display a count from 0 to 10
for count in range (11):
    print(count)
# display a count from 1 to 7
for count in range (1, 8):
    print(count)
```

Sub Programs

Functions return one or more values

```
def  my_function(Num_a):
      Result = Num_a *5
      return Result
```

Procedures perform a task but do not return anything to the main program

```
def my_Hello():
      print("Hello Poltair")
my_Hello()
```

9. Operators

Operator	Meaning
=	assignment
==	Is equal to
>	Is greater than
<	Is less than
!=	Is not equal to
>=	Greater than or equal to
<=	Less than or equal to

Operator	Symbol	Example
ADD	+	age + 10
SUBTRACT	-	year - 55
DIVIDE	/	days / weeks
MULTIPLY	*	months = age * 12
MOD (remainder)	MOD	days MOD weeks
DIV (whole number)	DIV	13 DIV 2
To the power of (x^n) exponent	** or ^	2**4

Design Technology - Briefs, Specifications, ideas and development

Design Briefs

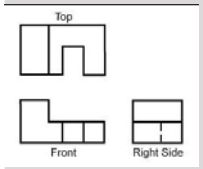
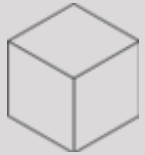
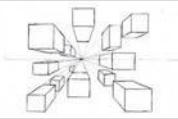
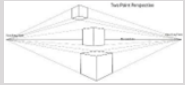
A Design Brief is the statement of how you will solve the Design Problem
It will often include:

- Constraints/ limitations
- What the product is
- Materials/processes
- Any key information you know

Design Specifications

- A Design Specification is a list of requirements your product has to meet in order to be successful
- It is also useful for evaluation. If your product hasn't met the Spec then it gives you a starting point
- for improvements.

Key Words	Definitions
Aesthetics	What the product looks like? Style? Colour Scheme? Design Movement?
Customer	Who would buy it? (Age, gender, socio-economic, personality) How does the design appeal to them?
Cost	How much will it cost? (min-max) Why?
Environment	Where will it be used? Why? How will you make it suitable?
Safety	How is it safe? How will it be checked? Why must it be safe?
Size	What is the maximum or minimum size? Why?
Function	What does the product do? What features make it do that function well? How is it unique from similar products?
Materials	What is it made from? Why?
Manufacture	How might it be made? Why? What scale of production? Why?

Technique	Description/ notes	Diagram
Orthographic Projection/ Working Drawings	• Includes "Front", "Plan" and "End" 2D Views, and often an Isometric 3D View • Standardised method for scale, dimensions and line types • Great for manufacturing	
Isometric	• Common 3D sketching method • Can be drawn free-hand or using isometric paper and ruler • Angles are at 30 degrees • Great for seeing most of the products	
1-Point Perspective	• A 3D drawing method • Often used by interior designers and architects • Gives drawings depth • Only uses 1 vanishing point	
2-Point Perspective	• Used for 3D designs • Exaggerates the 3D effect • Objects can be drawn above of below the horizon line but must go to the 2 vanishing points	
Annotated Drawings/ Free and Sketches	• Quick and easy way of getting ideas down • Range of ideas can be seen • Annotation helps explain designs further	
Exploded View	• Helps see a final design of a product and all it's parts • Can see where all the parts fit • Great for manufacturers	

Modelling and Development

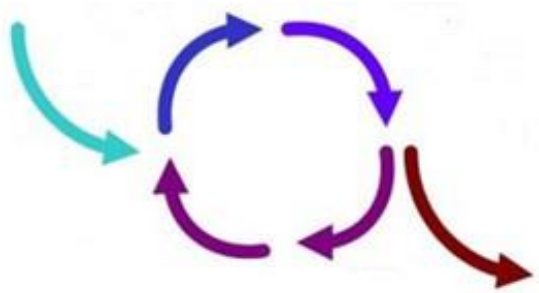
Modelling and development are key to testing and improving products This can be done physically using materials like; card, foam, clay, man-made boards or virtually in CAD.

Modelling helps the designer get feedback from the customer, check aesthetics, function, sizes and even materials and production methods and change them if needed

Design Technology - Design strategies

Design Strategies are used to solve Design Fixation, and help develop creative design ideas.

Iterative Design



- A Proposal is made
- It is then planned and developed to meet the brief
- It is analysed and refined
- It is then tested and modelled
- Then evaluated against the brief – many versions fail but that then informs development to make the idea better
- The cycle then repeats and if the product is successful it is then made and sold on the market

Advantages	Disadvantages
• Consistent testing helps solve problems earlier • Constant feedback • Easy evidence of progress	• Designers can loose sight of "the big picture" • Time consuming

User-Centred Design

- This is when designs are based on fulfilling the needs and wants of the Users/Clients at every stage of the design process
- Questioning and testing is ongoing and is often found through

Advantages	Disadvantages
• User feels listened to • Makes sure the product meets their needs	• Requires extra time to get customer feedback • If focused on just one person it can limit appeal to others

Systems Approach

- Usually used for electronic products
- Often uses diagrams to show systems in a visual way
- Planning the layout for the correct sequences e.g. inputs, outputs, timings, etc
- Electronics and mechanical systems need an ordered and logical approach

Advantages	Disadvantages
• Does not need specialist knowledge • Easy to communicate stages • Easy to find errors	• Sometimes over-simplifies stages • Can lead to unnecessary stages

Collaborative Approach

- Working with others to share data and solving problems and coming up with design proposals can help with creativity
- Numerous companies work in teams, and has been shown to improve the range and quality of ideas produced

Advantages	Disadvantages
• Gets multiple opinions and a range of views • Working in groups can produce more ideas	• Can be difficult to design ideas with opposing views • Can be difficult to find time to communicate with multiple people

Design Technology - Environment

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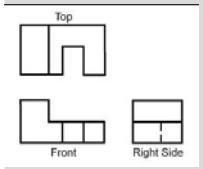
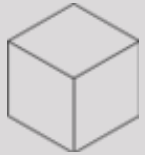
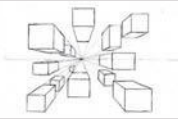
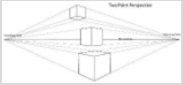
Technique	Description/ notes	Diagram
Orthographic Projection/ Working Drawings	• Includes "Front", "Plan" and "End" 2D Views, and often an Isometric 3D View • Standardised method for scale, dimensions and line types • Great for manufacturing	
Isometric	• Common 3D sketching method • Can be drawn free-hand or using isometric paper and ruler • Angles are at 30 degrees • Great for seeing most of the products	
1-Point Perspective	• A 3D drawing method • Often used by interior designers and architects • Gives drawings depth • Only uses 1 vanishing point	
2-Point Perspective	• Used for 3D designs • Exaggerates the 3D effect • Objects can be drawn above of below the horizon line but must go to the 2 vanishing points	
Annotated Drawings/ Free and Sketches	• Quick and easy way of getting ideas down • Range of ideas can be seen • Annotation helps explain designs further	
Exploded View	• Helps see a final design of a product and all it's parts • Can see where all the parts fit • Great for manufacturers	

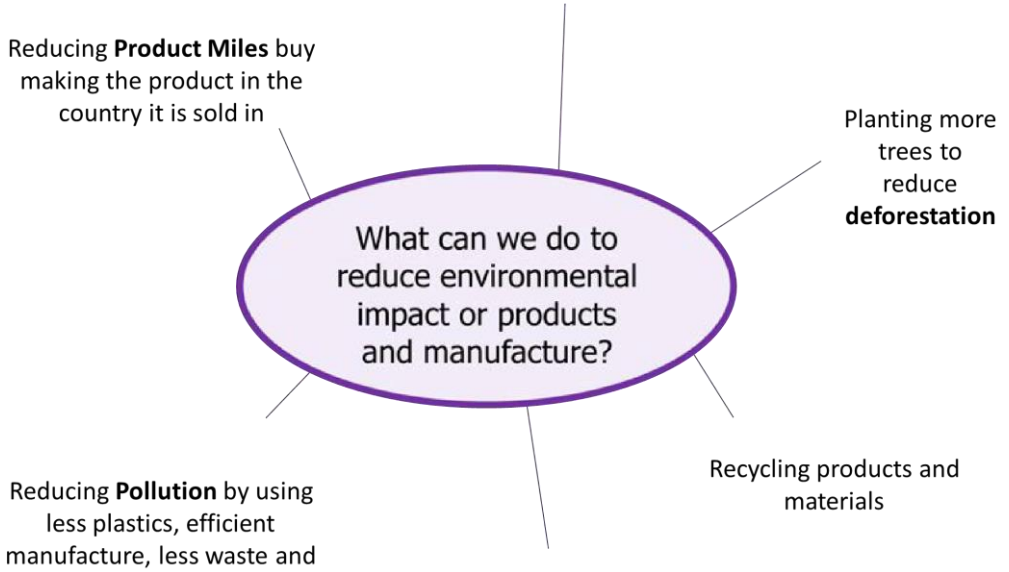
Modelling and Development

Modelling and development are key to testing and improving products This can be done physically using materials like; card, foam, clay, man-made boards or virtually in CAD.

Modelling helps the designer get feedback from the customer, check aesthetics, function, sizes and even materials and production methods and change them if needed

Design Technology - Environment

The 6Rs	Meaning
Reuse	To use a product again either for the same purpose or a different one
Reduce	To have less of material/packaging/pollution when making products by making them more efficient
Recycle	Breaking down and forming the material into another product
Refuse	Customers not buying or supporting products that make an environmental impact
Rethink	Designers and customer rethinking their decisions when making and buying products.
Repair	Fixing a product rather than throwing it away. Extending its life rather than using more resources to make another. Often products are Designed for Maintenance so can easily be repaired. E.g. Using screws so even non-specialists can take a product apart, or using components that can easily be replaced like fuses or batteries



Life Cycle Assessment

This is when a designer looks at the environmental impact a product makes over its life time and how it could be reduced. Including:

- Impact of materials
- Impact of processes
- Product Miles (how far a product has to travel to get from factory to consumer)
- Impact while in use
- Impact when disposed of (6Rs)

Sustainability

Sustainability is maintaining our planet and its resources and making a minimal negative impact

Finite Resources

Will run out of eventually

Plastics

Metals

Polymers (Textiles)

Infinite Resources

Can be re-grown and re-bread. Will not run out of

Paper

Boards

Natural Timbers

Cotton

Leather

Planned Obsolescence

This is where products “die” after a certain amount of time. E.g. Disposable cups, Phones, Lightbulbs, Printer Ink, etc This can have a big environmental impact as customers are throwing away lots of products, and resourc

Design Technology - People, Society and Culture

Market Pull and Technology Push

Technology Push is the development of new technology, materials and manufacturing methods to create new products or improve old ones.

Examples include; Smart Phones, Electricity, Mass Production, etc

Market pull is the demand from consumers for new products and improvements in old ones; this is often found via reviews, polls, surveys, etc Examples include; Product Aesthetics, making products easier to use, etc

Cultures, Faith and Belief

Different groups of people have different interests and have to be catered for.

Different countries and cultures also react to products differently.

E.g. In India McDonalds don't sell beef burgers as it has a large Hindu populatin, and cows are seen as sacred – in contrast the UK sells its most amount of fish and chips on a Friday as it is a Christian tradition to not eat meat on that day.

Case Study: £5 note

Hindu, Sikh and some other faith-based communities may choose to follow a vegetarian diet, and this is part of their culture. In addition to not eating meat, many followers of these faiths, as well as vegans and vegetarians, take every opportunity to avoid using animal products in their day-to-day lives.

The revelation in 2016 that the new polymer Bank of England £5 note contained tallow, an animal fat-based substance, upset a number of communities. There was a prompt call for the Bank of England to find an alternative way to produce the note and in the first two days of an official petition well over 100,000 signatures were received.

Shortly after the Bank of England admitted that the new polymer £5 note contained the animal by-product, some establishments refused to take the notes as a method of payment. One café owner was repulsed by the idea that the note contained tallow and believed that her customers supported her view. They received no complaints.

The Bank of England say they currently have no plans to change the manufacturing process.

Fashion and Trends

Fashion and Trends will change quickly, and you can see major differences in fashions over decades. Designers have to make sure their products meet the fashion and trends of the area they are designing and selling the product to. The change of products over time is called Product Evolution. This is caused by Market Pull, Technology Push and Fashion and Trends.

SEGA SATURN 3D CONTROL PAD

Sega Dreamcast Standard Controller

XBOX THE "DUKE"

XBOX TYPE-S CONTROLLER

XBOX 360 Standard Controller

Some products are seen as timeless. These products are called Iconic Designs. These products are timeless because they were innovative, set a bench mark for following products, changed their industry and are often copied.

Examples include; iPod, iPhone, Angle-Poise Lamp, Swiss Army Knife, Converse Shoes, Levi's Jeans, Classic Mini Cooper

SPITFIRE R.J. MITCHELL 1936

STRATOCASTER GUITAR Electric Guitar Designed By Leo Fender, George Fullerton, and Freddie Tavares In 1954

SIR ALEC ISSIGONIS' ORIGINAL MINI 1959

SONY WALKMAN Walkman TPS-L2 (1979) 1979

iPod Touch 2007

Inclusive vs. Exclusive Design

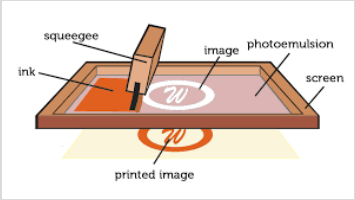
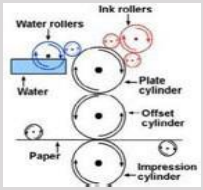
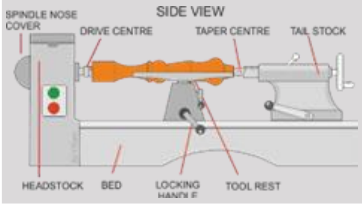
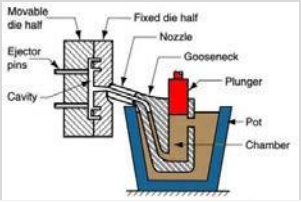
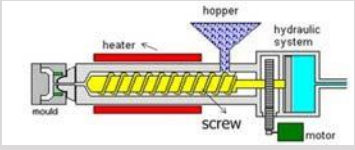
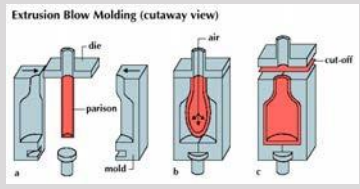
Inclusive Design: The aim to create a product that as many people as possible can use

Examples include; Cars, Doorframes, Adjustable Products, etc

Exclusive Design: The aim to create a product for a particular group and their needs

Examples include; Car seats for babies, Wheelchairs, Stair Lifts

Design Technology - Production Processes

Name of Process	Diagram	Material	Products Made	Key info
Screen-printing		Papers and Textiles	Posters, signs and t-shirts	Screen printing places paint on top of a screen. The screen has a stencil embedded in it, so when the paint is passed across it the desired shape is printed underneath. Good process in one-off and batch production as often done by hand
Offset Lithography		Papers and card (thin, flexible plastics)	Posters, newspapers, plastics bags	Rollers containing the colours and water go onto the plate cylinder. The water stops the colours sticking to certain places, creating the shape. The shape is transferred between rollers and onto the material. Can be used at batch and mass production
Lathe Turning		Wood and metal	Chair legs, baseball bats (cylindrical items)	Material is placed between the tail stock and the headstock and spun at high speed. The material is then cut using specialist tools (either by hand or my automated machinery) to the desired shape. Can be used in one-of and batch production
Die Casting		Metal	Car parts, engine components, etc	Molten metal is poured into a chamber and a plunger forces the metal through the nozzle into the mould. Unlike sand casting, the mould is reusable. Good process for both one-of and batch production
Injection Moulding		Plastics	Chairs, toys, etc	Plastic granules are poured into the hopper and onto the screw. The screw moves the material towards the heater where it turns into a liquid. The liquid is then forced into the mould, cooled and released. Great process for mass production as it makes 100s+ of products at once, to a identical standard.
Blow Moulding		Plastics	Plastic bottles	A Plastic parison is heated and put into the mould. The parison is then filled with air (like blowing up a balloon) and is forced to fit the mould shape. It is then cooled and then released. This is a great process for mass producing bottles.

Design Technology - Work of others and Customer Research

Image/ Example	Designer	Design Movement	Key info
	William Morris	Arts and Crafts	• British designer in 1880s • Simple natural crafts • Useful and beautiful products (wallpapers, cushions, etc)
	Charles Rennie Mackintosh	Art Nouveau	• Scottish designer in 1860s – 1920s • Known for light and shadow • Created stained glass and furniture • Inspired by nature and geometric lines
	Ettore Stottas	Memphis	• Italian designer in the 1950s/60s • Enjoyed making everyday objects wacky and bold • Used lots of bold colours and black lines

Image/ Example	Brand	Key info
	Alessi	• Italian Design Company • Homeware and kitchen utensils • "Post-modern" style • Phillipe Starke is a major designer
	Apple	• USA-based tech company • Famous for iconic designs of iPod and iPhone • Steve Jobs and Johnathon Ive are major designers • Known for innovative and modern design
	Dyson	• British engineering company • Famous for vacuum cleaners and innovative technology • James Dyson is a major designer

Research can be divided into 2 categories; Primary Research and Secondary Research. Primary is research you complete yourself. Secondary is research from resources others can gathered e.g. books, magazines and internet Primary research is generally more reliable as it is done by the person using it and can double-check the data

Anthropometrics and Ergonomics

Another key piece of research, is Anthropometrics and Ergonomics. This helps develop the sizes of products, etc to make sure it fits the User

Anthropometrics	The study of measurements of the human body. E.g. Knowing the grip width of a palm, if designing a new travel coffee cup
Ergonomics	The application of anthropometrics to ensure products are safe and comfortable to use. This can aso include; size, material, appearance, brightness, sound and texture. E.g. making sure the travel cup is the correct size, and an insulating smooth material to make it comfortable

Engineering - Understanding engineering drawings

1. Interpreting engineering drawings

Designers and engineers use engineering drawings to convey information and details about the product to be manufactured or constructed.

Engineering drawings include details such as:

- sizes of parts or elements to be made
- details on materials
- information on finishes
- various views of the product
- tolerances
- scale
- details of complex parts.

Scale informs the engineer what scale should be used when using the drawing. A scale of 5:1 indicates that the drawings are five times smaller than the original product should be. This allows engineers to take dimensions (sizes) directly off the engineering drawings. Care must be taken when doing this to ensure the correct scale is applied.

Finishes information gives details on what the finish of the part or product would look like, for example, a knurled finish on a tightening clamp.

Detail views are sometimes used by engineers to explain the details of more complex parts in an engineering drawing.

Title blocks are used to display key sections of information about the drawing, i.e. scale, who made the drawing, the date it was drawn, the drawing number.

Orthographic views are the standard views used to lay out a set of engineering drawings. They must conform to British standards (BS8888) to allow a common format of presenting information to various people such as manufacturers.

Section views show a drawing of a part that may have been cut through to allow the reader to see further details.

Isometric views are often used by engineers and designers to produce a three-dimensional representation of the product or part.

2. Interpreting engineering information

Engineers need to interpret the information found on engineering drawings to assist them in manufacturing.

The information should be used to identify key areas in preparation for planning such as:

Equipment that will be required to manufacture the engineered product.

Tools that will also be required during the manufacturing should be identified.

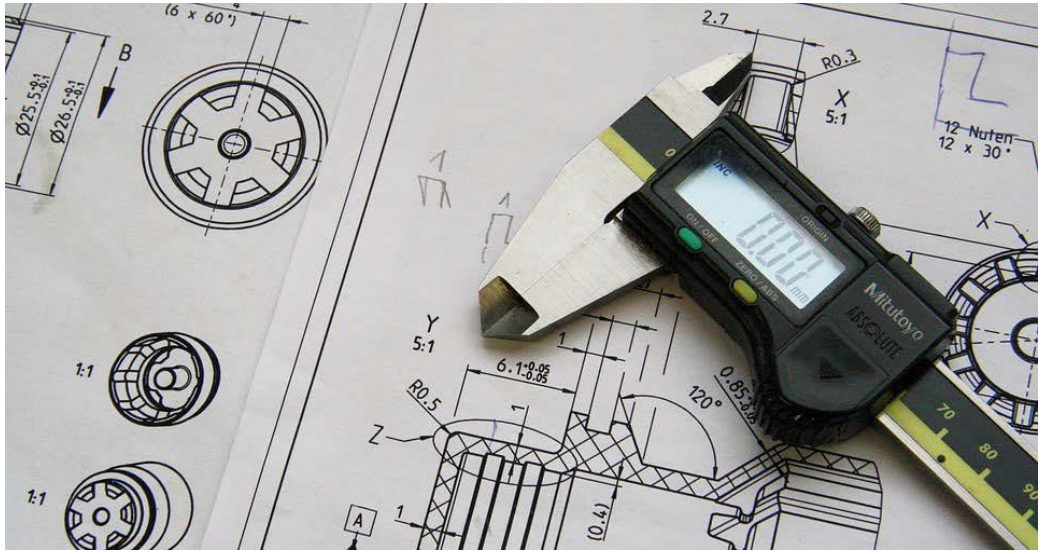
Tolerances are the minimum and maximum limit that a part can be outside of the stated dimension (size) on a drawing. For example, a part that is 20mm long with a tolerance of ±0.3mm would be acceptable if it was 20.3mm or 19.7mm when finally tested.

3. Presenting engineering information

Engineers and manufacturers need to know specific information about the product before they can manufacture it.

The people who will undertake the manufacturing must also understand specific details about how processes are carried out i.e.

- which speed should be used to drill a particular size hole in a particular material
- what speed is needed to cut a slot in a piece of aluminium
- which size hole should be drilled in a material to create a given thread size
- what finished must be applied to a material when it is manufactured
- what component parts are required in production (nuts, washers etc.).



Engineering - Planning manufacture

1. Planning manufacture

Before any manufacturing can take place, a plan is needed to determine each stage or step of the process.

The plan should include:

- the materials to be used to produce the engineered product
- what equipment will need to be used
- what tools will be needed
- the sequence (order) that manufacturing needs to take place in.

The sequences need to consider in what order parts are manufactured, as some parts require others to be made to ensure they join correctly, etc. This is also known as prioritising.

2. Equipment selection

Equipment should be classed as any powered machinery that will be used in the production of an engineered outcome.

Equipment choices should give justifications for their selection and should refer to engineering drawings or other provided sources.

Typical equipment may include:

- centre lathe
- drills
- miller
- laser cutter
- bandsaw
- linisher
- brazing hearth
- buffer/polisher

3. Tool selection

Tools should be classed as any hand tools that will be used in the production of an engineered outcome. These should also include marking and measuring tools.

Tool choices should be justified in the planning stages to explain why they were selected.

These include:

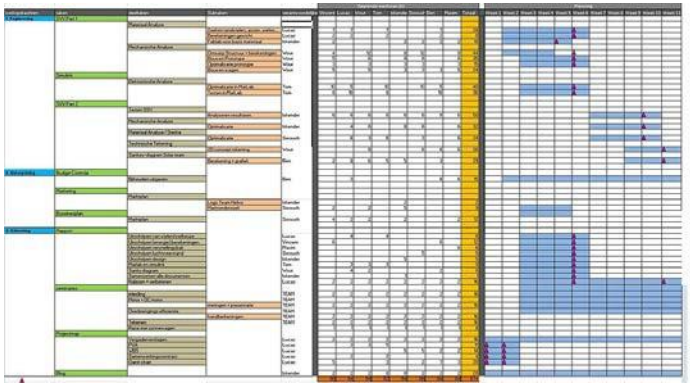
- scriber
- centre punch
- standard, internal, external and odd leg callipers
- soldering iron
- steel rule
- engineer's square
- file
- dividers
- micrometre
- vernier callipers
- rivet sets
- taps and dies
- hacksaw
- fretsaw
- pliers
- screwdriver

4. Planning and sequencing

Plans for manufacture should be presented in a way which is easy to find key information at a glance. Planning information could include tables such as a GANTT chart or other lists or appropriate documents.

Manufacturers should be able to understand from the provided information, the sequence of manufacture and the time it should take to produce the part, which tools and equipment should be required for each stage and any processes such as the use of jigs or templates.

Planning and sequencing should also consider the use of CAM (where appropriate), including 3D printing and laser cutting.



Contingency planning

Planning should also include contingencies to overcome problems that may arise during production. What happens if a machine breaks down or people become ill?

Contingency planning should include ways that problems can be overcome, giving examples of scenarios and possible contingencies.

Engineering - Using engineering tools and equipment

1. Using engineering tools

Files are used to remove material from stock form of metals and plastics. This is known as wastage.

Scribers are used to mark lines for cutting on materials such as metals and plastics.

Centre punch is a tool that is used to create a small depression in material prior to drilling. This helps locate the drill accurately on the material.

Tap and die sets are used to created threaded components. A tap used to thread a hole and a die to thread a bar (i.e. a bolt).

Hacksaws are a framed saw used mainly to cut metal.

Rivet guns are used to place rivets in areas that are often accessible from one side. Traditional rivets use 'sets' to form the rivet on both sides of a joint.

An engineer's square is used in marking out material. It is set at 90° and is also used for parallel marking.

Callipers are used to scribe and measure on metals and plastics. Odd leg callipers can be used to scribe lined parallel to an edge, whilst straight leg callipers can be used to both mark equal distance sizes and produce arcs and circles.

Vernier callipers are used to measure a range of sizes such as length of material, depth of holes, internal openings, etc.

Micrometres are highly accurate measuring tools used to measure sizes, i.e. material width/thickness.

Reamers enlarge, smooth, or contour an existing drilled hole in a work piece for a precise fit when installing fasteners or other parts in metalworking tasks.

Shears and snips are used to cut sheet metal. They may be straight or curved depending on the task.

Gauges are used in a variety of engineering manufacturing tasks such as centre gauges, which locate a centre on a metal bar, and thread gauges, which identify the size and pitch on a screw thread.

In addition to the examples above, tools can also include items used on items of equipment known as tooling:

Knurling tools are used to put a textured grip onto a metal bar using a lathe.

A boring bar is used to enlarge a drilled hole to a precise dimension. They are available for a lathe or a milling machine.

Parting tools are used on a lathes to form a narrow slot to assist in the removal of a work piece from the stock/waste material to remove.

2. Using engineering equipment

Commonly used items of equipment that you may find in a school workshop:

Centre lathe

- Facing off is the process of levelling off the end of the material
- Turning a taper causes a uniformed change in diameter over a set length on a bar
- Applying a knurled finish
- Boring a hole
- Drilling along the centre axis line
- Cutting a thread onto a bar or into a hole.

Drilling machine

- Drilling holes using a range of drill bits
- Trimming off using a trimming tool, i.e. vacuum forming.

Miller

- End milling is used to create a profile in the work piece, including square
- End mills, ball end mills, finishing mills and corner rounding mills
- Slot milling involves using a cutter, which cuts slots or groves into the material.

PCB tank

- Used to produce printed circuit boards for electronic circuits
- Uses a photographic and etching process and is used in combination with a UV light box to prepare the PCB artwork.

Vacuum forming:

- A process where a sheet of plastic is heated to a forming temperature, stretched onto a single-surface mould and forced against the mould by a vacuum.

Engineering - Health and safety

1. Health and safety

Assessing potential risks is a process that is undertaken prior starting manufacture. It should identify what potential hazards and risks may be present. This should include both the working environment and the actual items of equipment to be used.

Deciding on control measures should focus on stating how the identified risks and hazards can be mitigated (made safe). This should include detailing about guards on equipment and specific any hazards around the working environment.

Personal protective equipment should also be identified for manufacturing stages and should only include appropriate choices suitable for the individual task being undertaken.

Health and safety should also form a part of the overall planning stages.

2. Implementing engineering processes

This involves the physical making of an engineering product using a range of processes to produce a product or part. These can include:

Marking out is a process where the required shape is marked onto the stock material.

Cutting can occur using a hand tool like a hacksaw, sheers or snips saw or fretsaw, or using machinery such as a metal bandsaw.

Milling uses a milling machine to cult slots in blocks of metals, and to face off edges.

Finishing is applied at the end stage of production. It could include a range of finishes such as polishing, knurling, enamelling, electroplating or anodizing.

Shaping can involve the removal of materials, called wasting, using saws, files or grinding equipment.

Drilling is a process used when a hole is required in a material. Drilling can be done using a hand drill, or drill press/pillar drill.

Brazing typically involves a brazing hearth to braze metals together forming a permanent joint.

Turning uses a machine called a lathe that can be used to turn a piece of metal to create differently shaped round pieces. It can also be used to create threads and to apply different knurled finishes.

Joining metals can be done permanently using welding, brazing, epoxy resin adhesives and soldering. Temporary methods include nuts and bolts, hinges, screws and rivets.

Soldering is used to heat join softer metals such as silver in jewellery (silver solder) or to attach electronic components to printed circuit boards.

Forming is a process used to change the shape of the material, for example by bending, compressing or extruding.

3. Evaluating the quality of engineered products

Engineers, manufacturers and designers need to constantly evaluate stages of manufacture to ensure that outcomes are produced in line with the given criteria.

Typical examples are:

Inspection techniques can combine a range of methods that can be undertaken to ensure that the product or part meets the set criteria. They could include visual inspection, looking for manufacturing defects or sophisticated digital scanning techniques, which assess accuracy to a minute detail.

Evaluating against a success criteria requires the end product or part to be reviewed against information that may have been included in a brief or manufacturing specification.

Evaluating against engineering information requires checking against information obtained from engineering drawings. This could include checking sizes and finish details but also checking that the tolerances of the final parts are within the allowed parameters.

Quality inspection can include inspection of individual parts as they are manufactured or as they are assembled on the completed engineered product.

Geography - The Changing Economic World

1. What is development?

Development is an improvement in living standards through better use of resources.

Economic	This is progress in economic growth through levels of industrialisation and use of technology.
Social	This is an improvement in people's standard of living. For example, clean water and electricity.
Environmental	This is an improvement in people's standard of living. For example, clean water and electricity.

2. Measuring development

These are used to compare and understand a country's level of development.

Economic indictors examples

Employment type	The proportion of the population working in primary, secondary, tertiary and quaternary industries.
Gross Domestic Product per capita	This is the total value of goods and services produced in a country per person, per year.
Gross National Income per capita	This is the total value of goods and services produced in a country per person, per year.

Social indicators examples

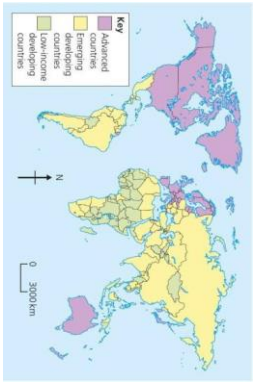
Infant mortality	The number of children who die before reaching 1 per 1000 babies born.
Literacy rate	The percentage of population over the age of 15 who can read and write.
Life expectancy	The average lifespan of someone born in that country.

mixed indicators

Human Development Index (HDI)	A number that uses life expectancy, education level and income per person.

3. Variations in the level of development

LICs	Poorest countries in the world. GNI per capita is low and most citizens have a low standard of living.
NEEs	These countries are getting richer as their economy is progressing from the primary industry to the secondary industry. Greater exports leads to better wages.
HICs	These countries are wealthy with a high GNI per capita and standards of living. These countries can spend money on services.



4. Causes of uneven development

Development is globally uneven with most HICs located in Europe, North America and Oceania. Most NEEs are in Asia and South America, whilst most LICs are in Africa. Remember, development can also vary within countries too.

5. Physical factors affecting uneven development

Natural resources

- Fuel sources such as oil.
- Minerals and metals for fuel.
- Availability for timber.
- Access to safe water.

Natural Hazards

- Risk of tectonic hazards.
- Benefits from volcanic material and floodwater.
- Frequent hazards undermines redevelopment

Climate

- Reliability of rainfall to benefit farming.
- Extreme climates limit industry and affects health.
- Climate can attract tourists.

Location/Terrain

- Landlocked countries may find trade difficulties.
- Mountainous terrain makes farming difficult.
- Scenery attracts tourists.

6. Human factors affecting uneven development

Aid

- Aid can help some countries develop key projects for infrastructure faster.
- Aid can improve services such as schools, hospitals and roads.
- Too much reliance on aid might stop other trade links becoming established.

Trade

- Countries that export more than they import have a trade surplus. This can improve the national economy.
- Having good trade relationships.
- Trading goods and services is more profitable than raw materials.

Education

- Education creates a skilled workforce meaning more goods and services are produced.
- Educated people earn more money, meaning they also pay more taxes. This money can help develop the country in the future.

Health

- Lack of clean water and poor healthcare means a large number of people suffer from diseases.
- People who are ill cannot work so there is little contribution to the economy.
- More money on healthcare means less spent on development.

Politics

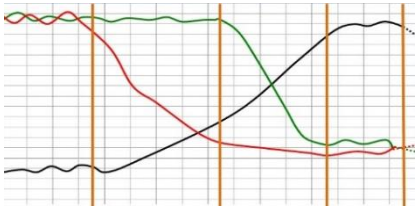
- Corruption in local and national governments.
- The stability of the government can effect the country's ability to trade.
- Ability of the country to invest into services and infrastructure.

History

- Colonialism has helped Europe develop, but slowed down development in many other countries.
- Countries that went through industrialisation a while ago, have now develop further.

3. The Demographic Transition Model

The demographic transition model (DTM) shows population change over time. It studies how birth rate and death rate affect the total population of a country.



STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5
High DR High BR Steady	BR Low Declining DR Very High	Rapidly falling DR Low BR High	Low DR Low BR Zero	Slowly Falling DR Low BR Negative
e.g. Tribes	e.g. Kenya	e.g. India	e.g. UK	e.g. Japan

Geography - The Changing Economic World

7. Consequences of Uneven Development

Levels of development are different in different countries. This uneven development has consequences for countries, especially in wealth, health and migration.

Wealth	People in more developed countries have higher incomes than less developed countries.
Health	Better healthcare means that people in more developed countries live longer than those in less developed countries.
Migration	If nearby countries have higher levels of development or are secure, people will move to seek better opportunities and standard of living.

8. Reducing the Global Development Gap

Microfinance Loans

This involves people in LICs receiving smalls loans from traditional banks.

- ✓ Loans enable people to begin their own businesses
- Ɛ Its not clear they can reduce poverty at a large scale.

Aid

This is given by one country to another as money or resources.

- ✓ Improve literacy rates, building dams, improving agriculture.
- Ɛ Can be wasted by corrupt governments or they can become too reliant on aid.

Fair trade

This is a movement where farmers get a fair price for the goods produced.

- ✓ Paid fairly so they can develop schools & health centres
- Ɛ Only a tiny proportion of the extra money reaches producers.

Foreign-direct investment

This is when one country buys property or infrastructure in another country.

- ✓ Leads to better access to finance, technology & expertise.
- Ɛ Investment can come with strings attached that country's will need to comply with

Debt Relief

This is when a country's debt is cancelled or interest rates are lowered.

- ✓ Means more money can be spent on development.
- Ɛ Locals might not always get a say. Some aid can be tied under condition from donor country.

Technology

Includes tools, machines and affordable equipment that improve quality of life.

- ✓ Renewable energy is less expensive and polluting.
- Ɛ Requires initial investment and skills in operating technology

9. CS: Reducing the Development Gap In Jamaica

Location and Background

Jamaica is a LIC island nation part of the Caribbean. Location makes Jamaica an attractive place for visitors to explore the tropical blue seas, skies and palm filled sandy beaches

Tourist economy

- In 2015, 2.12 million visited.
- Tourism contributes 27% of GDP and will increase to 38% by 2025.
- 130,000 jobs rely on tourism.
- Global recession 2008 caused a decline in tourism. Now tourism is beginning to recover.

Multiplier effect

- Jobs from tourism have meant more money has been spent in shops and other businesses.
- Government has invested in infrastructure to support tourism.
- New sewage treatment plants have reduced pollution.

Development Problems

- Tourists do not always spend much money outside their resorts.
- Infrastructure improvements have not spread to the whole island.
- Many people in Jamaica still live in poor quality housing and lack basic services such as healthcare.

10. Case Study: Economic Development in Nigeria

Location & Importance

Nigeria is a NEE in West Africa. Nigeria is just north of the Equator and experiences a range of environments.

Nigeria is the most populous and economically powerful country in Africa. Economic growth has been base on oil exports.

Influences upon Nigeria's development

Political

Suffered instability with a civil war between 1967-1970.

From 1999, the country became stable with free and fair elections.

Stability has encouraged global investment from China and USA.

Cultural

Nigeria's diversity has created rich and varied artistic culture.

The country has a rich music, literacy and film industry (i.e. Nollywood).

A successful national football side.

The role of TNCs

TNCs such as Shell have played an important role in its economy.

- ✓ Investment has increased employment and income.
- Ɛ Profits move to HICs.
- Ɛ Many oil spills have damaged fragile environments.

Social

Nigeria is a multi-cultural, multi-faith society.

Although mostly a strength, diversity has caused regional conflicts from groups such as the Boko Haram terrorists.

Industrial Structures

Once mainly based on agriculture, 50% of its economy is now manufacturing and services.

A thriving manufacturing industry is increasing foreign investment and employment opportunities.

Changing Relationships

Nigeria plays a leading role with the African Union and UN.

Growing links with China with huge investment in infrastructure.

Main import includes petrol from the EU, cars from Brazil and phones from China.

Geography - The Changing Economic World

10. Case Study: Economic Development in Nigeria

Environmental Impacts

The 2008/09 oil spills devastated swamps and its ecosystems.

Industry has caused toxic chemicals to be discharged in open sewers - risking human health.

80% of forest have been cut down. This also increases CO^2 emissions.

Aid & Debt relief

- ✓ Receives $5billion per year in aid.
- ✓ Aid groups (ActionAid) have improved health centres, provided anti-mosquito nets and helped to protect people against AIDS/HIV.
- ✗ Some aid fails to reach the people who need it due to corruption.

Effects of Economic Development

Life expectancy has increased from 46 to 53 years. 64% have access to safe water. Typical schooling years has increased from 7 to 9.

11. Case Study: Economic Change in the UK

UK in the Wider World

The UK has one of the largest economies in the world.

The UK has huge political, economic and cultural influences.

The UK is highly regarded for its fairness and tolerance.

The UK has global transport links i.e. Heathrow and the Eurostar.

Causes of Economic Change

De-industrialisation and the decline of the UK's industrial base.

Globalisation has meant many industries have moved overseas, where labour costs are lower.

Government investing in supporting vital businesses.

Towards Post-Industrial

The quaternary industry has increased, whilst secondary has decreased.

Numbers in primary and tertiary industry has stayed the steady.

Big increase in professional and technical jobs.

Developments of Science Parks

Science Parks are groups of scientific and technical knowledge based businesses on a single site.

- Access to transport routes.
- Highly educated workers.
- Staff benefit from attractive working conditions.
- Attracts clusters of related high-tech businesses.

CS: UK Car Industry

Every year the UK makes 1.5 million cars. These factories are owned by large TNCs. i.e. Nissan.

- 7% of energy used there factories is from wind energy.
- New cars are more energy efficient and lighter.
- Nissan produces electric and hybrid cars.

Change to a Rural Landscape

Social

Rising house prices have caused tensions in villages.

Villages are unpopulated during the day causing loss of identity.

Resentment towards poor migrant communities.

Economic

Lack of affordable housing for local first time buyers.

Sales of farmland has increased rural unemployment.

Influx of poor migrants puts pressures on local services.

Improvements to Transport

A £15 billion 'Road Improvement Strategy'. This will involve 10 new roads and 1,600 extra lanes.

£50 billion HS2 railway to improve connections between key UK cities.

£18 billion on Heathrow's controversial third runway.

UK has many large ports for importing and exporting goods.

UK North/South Divide

- – Wages are lower in the North.
- – Health is better in the South.
- – Education is worse in the North.
- ✓ The government is aiming to support a Northern Powerhouse project to resolve regional differences.
- ✓ More devolving of powers to disadvantaged regions.

Geography – UK Economy

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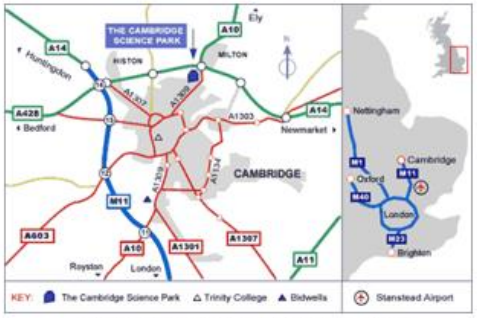


The location of Cambridge Science Park at a national and regional scale

Why is there a north-south divide?

Industrial Revolution

UK growth was centred around the coalfields of Wales, N England and Scotland

Heavy industries thrived in Sheffield, Glasgow & Manchester

Industrial Decline

Since the 1970's steel & heavy industries have declined

Unemployment has increased

Coalfields have become exhausted

By train from Cambridge Science Park it takes 52 minutes to get to London

Close to Stansted airport (Gatwick and Heathrow via the M25)

Background information

The Cambridge Science Park, founded by Trinity College in 1970 is the oldest Science Park in the United Kingdom.

It is a concentration of science and technology related businesses, and has strong links with the nearby city of Cambridge.

Cambridge Science park is home to more than 100 businesses which are involved in lots of areas of expertise such as medical , IT and environmental.

There is a large range of services on site to help the people who work in the Park. Some of the environmentally friendly services include recycling facilities and landscaping to attract more wildlife to the area

The science Park is close to Cambridge University so that it can draw on scientific knowledge of many experts.

Facilities:

- Landscaped surroundings
- Nurseries
- Health and fitness centre
- Cafes
- Conference facilities

Microsoft

Cambridge science park received a huge boost when Microsoft pledged £50 million to build its first European computer research centre there in 1997.

Microsoft

History – Paper 1: Medicine Through time, c.1250-Present Day + Medicine in the Trenches 1914-1918

Key Topic 1: What was medicine like in the Medieval Period, c.1250-1500?

Key words	
Physician	A qualified doctor
Symptom	A sign or feature of an illness
Flagellants	Religious people who whipped themselves in hopes that God wouldn't send plague
Miasma	Bad air (poisonous, foul smelling fumes)
Muck rakers / night soil men	Workers hired by local authorities to empty cess pits and dispose of the contents.
Cess pits	Holes in the ground below a privy (toilet) where the waste collected
Blood-letting	Taking blood from a patient in an attempt to treat their illness
Humours	A theory claiming the body is divided into 4 humours or liquids: blood, black bile, yellow bile and phlegm.
Pestilence	A word used in the Middle Ages for the plague
Plague Pneumonic/ Bubonic	Bubonic plague is spread by fleas and originates from black rats from China. Pneumonic plague is spread by a person already with the virus through their coughs and sneezes.
Bubo / buboes	Swollen lumps in armpit and neck glands – a symptom of plague
Planet alignment	When planets in our solar system line up in their orbits. Thought by astrologists to have impact on human health & behaviour

Core knowledge	
1. Name the 2 main influences on medical understanding in the medieval period	Galen and Hippocrates
2. Why couldn't their theories be disproven?	Dissections were banned by the Church
3. Why didn't people question the Church in the medieval period?	Feared they would go to hell
4. What was the 'Theory of the Four Humours'?	If the 4 liquids are not perfectly balanced you will get sick
5. How many physicians were there during the medieval period?	Approx. 100.
6. Who carried out treatments and minor operations?	Barber Surgeons
7. How did 'wise women' treat people?	Herbal remedies
8. How were medieval towns/villages kept clean	'Rakers', Laws against throwing waste
9. When was the Black Death and how many people died?	1348 and 2 million
10. What did people believe caused the Black Death?	God's punishment, miasma (bad air)
11. How did people try to prevent the Black Death?	Praying, Keep air moving, Flagellants

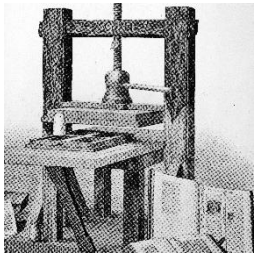
The Black Death in 1348

History - Paper 1: Medicine Through time, c.1250-Present Day + Medicine in the Trenches 1914-1918

Key Topic 2: What was medicine like in the Early Modern Period, c.1500-1700?

Key words	
Dissection	Cutting up a corpse to study the internal organs and structure.
Anatomy	The study of the human body
Privy / latrine / water closets	A toilet, usually a public or shared one.
Almshouse / poor house	Charitable housing provided to vulnerable people in the community, run by church or set up by wealthy benefactors.
Renaissance	Re-birth; a period of time where people return to questioning and scientific experienments
Printing Press	Invented in 1440, but impact felt in Renaissance period. Took control of information out of the Church's control, and allowed for new ideas to be shared.

Page from Vesalius' book The Fabric of the Human Body



The Printing Press

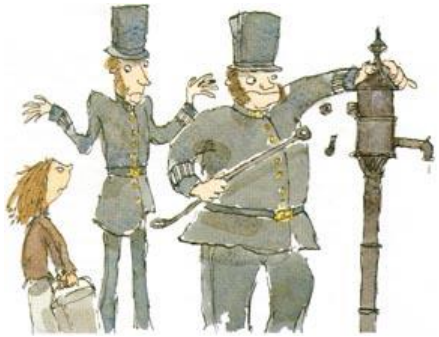
Core knowledge	
12. What treatments did people still use in the Renaissance period?	Bloodletting and purging, praying, herbal remedies
13. How did Vesalius prove Galen wrong in more than 200 ways?	Learnt about anatomy from dissections
14. Why was Thomas Sydenham known as the English Hippocrates?	Emphasised careful observation. Each disease was different.
15. Who discovered that blood is pumped around the body by the heart?	William Harvey
16. Why were his theories slow to be accepted?	No evidence (needed microscope), power of the Church
17. What did Gutenberg invent?	Printing press
18. What did Leeunwenhoek invent?	Microscope
19. What group included scientists who discussed and experimented?	Royal Society
20. When was the Great Plague?	1665
21. How did people try to prevent the Great Plague?	Praying, Quarantine, Dogs and cats killed, Amber burnt on streets

History - PAPER 1: Medicine Through time, c.1250-Present Day + Medicine in the Trenches 1914-1918

Key Topic 3: What was medicine like in the 18TH AND 19TH Centuries, c.1700-1900?

Key words	
Industrial Revolution	The period c.1750-1900 which saw new machines and technology that led to mass production and increase in population in towns.
Laissez-Faire	The point of view of the government in the 1700-mid 1800s. They did not interfere in people's lives or health.
Smallpox	A viral disease that causes disfiguring blisters leaving scars. To some vulnerable people it can be fatal
Sanitation	The provision of clean water, with waste being kept separate.
Amputation	Surgical removal of a limb
Cauterise	Following amputation the wound would be burned to seal it
Antiseptics	Chemicals that kill bacteria and prevent infection
Industrial Revolution	The period c.1750-1900 which saw new machines and technology that led to mass production and increase in population in towns.

Florence Nightingale



Core knowledge	
22. What did Edward Jenner invent?	Smallpox vaccine
23. What did people believe caused disease before Germ Theory was published?	Spontaneous Generation of germs
24. Whose theory was germs cause disease?	Louis Pasteur, 1861
25. What vaccines were discovered as a result of Pasteur's and Koch's work?	Rabies, typhoid, tuberculosis, diphtheria, tetanus
26. What did Florence Nightingale do?	Cleaned up hospitals. Reduced death rate from infection from 40% to 2%.
27. What did John Snow discover?	Source of cholera outbreak in 1854. (Broad Street pump)
28. Why did the government pass the 1875 Public Health Act?	Report: Conditions in working class areas were terrible
29. What did Edwin Chadwick publish in 1842?	Voting reforms, the Great Stink, Germ Theory
30. What were the 3 biggest problems in surgery at the beginning of the 19th Century?	Pain, infection and blood loss
31. What 3 methods were used to try and deal with pain in surgery?	Ether, laughing gas and chloroform
32. What did Joseph Lister develop?	Using carbolic acid spray as an anti-septic.
33. Who discovered DNA's structure?	Crick and Watson
34. Which three reports established the link between poverty and poor health?	Chadwick, Booth and Rowntree

History - PAPER 1: Medicine Through time, c.1250-Present Day + Medicine in the Trenches 1914-1918

Key Topic 4: What is medicine like in the Modern Period, c.1900-Present Day?

Key words	
Magic bullet	A chemical / synthetic / man-made drug that targets and kills disease-microbes
Alternative therapies	Medical treatments not involving drugs e.g. acupuncture
Transfusion	Transferring blood from a donor to a recipient (person receiving the donated blood)
Genetic screening	The study of a person's DNA sequence in order to identify susceptibility to particular diseases
Stem cell research	Stems cells are extracted from human embryos and can be grown to repair faulty cells in a patients body, but the embryo dies.
Gangrene / sepsis	Death of body tissue due to lack of blood flow or serious bacterial infection
Magic bullet	A chemical / synthetic / man-made drug that targets and kills disease-microbes
Alternative therapies	Medical treatments not involving drugs e.g. acupuncture

Core knowledge	
35. Give two examples of technology that has led to improved diagnosis.	Endoscopes, microscopes, scans, nuclear medicine
36. What did Alexander Fleming discover in 1928?	Penicillin
37. When did Florey and Chain begin working on penicillin?	1938
38. Why did the government begin funding mass production of penicillin?	Second World War
39. What did Paul Erlich discover?	Salvarson 606 – the first magic bullet
40. What were the Liberal Reforms?	Laws passed by the Liberal government (1906-1914) aimed to improve the lives of ordinary people
41. What did the Beveridge Report call for?	A National Health Service (NHS), 1948
42. Give three examples of high-tech medical treatments.	Blood transfusions, X-rays, radiotherapy, transplants, gene therapy, dialysis, keyhole surgery, pacemakers.
43. What attempts have been made to prevent lung cancer?	Advertising campaigns and anti-smoking laws.

Salverson 606 Magic Bullet

X-Rays, new technology of the modern period

NHS healthy living campaign poster

History - PAPER 1: Medicine Through time, c.1250-Present Day + Medicine in the Trenches 1914-1918

Key Topic 5: DEPTH STUDY: What is medicine like in the British sector of the Western?

Key words	
Front	An edge or boarder; Western Front where the trenches were and the opposing sides fought
Salient	A piece of land or section of fortification that sticks out to form an angle e.g. the Ypres Salient
Sodium citrate	A chemical added to donated blood to stop it clotting
Citrate glucose	A chemical added to donated blood so it can be stored for longer
Blood depot	A blood bank / storage facility for donated blood
Gas gangrene	When a wound is infected the skin swells and a foul-smelling gas is released when the wound is treated
Sterile	A germ free environment
Pedicle tubes	Tubes made from a patient's skin tissue whilst still attached to the body. Stitched onto a wound helping the body to heal itself and avoid infection

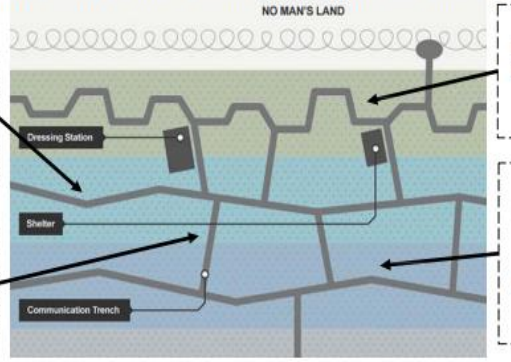
Core knowledge	
44. What were the tunnels used for at the Battle of Arras?	Underground hospital
45. How many British casualties were there on the first day of the Battle of the Somme?	60,000
46. What were three of the main illnesses suffered in the trenches?	Trench foot, Trench fever, Shell shock
47. What was the effect of shrapnel?	Infection due to dirty terrain
48. What happened at the Regimental First Aid Post?	Wounded were triaged
49. What was the FANY?	First Aid Nursing Yeomanry
50. Why had blood transfusions often been unsuccessful before the First World War?	Didn't know different blood groups, couldn't store blood

History - PAPER 1: Medicine Through time, c.1250-Present Day + Medicine in the Trenches 1914-1918

Key Topic 5: DEPTH STUDY: What is medicine like in the British sector of the Western? Front, 1914-1918?

The Trench System

This shows the main features of the Trench System from the Western Front, they were often quite different but they were mostly laid out this way. No Man's Land was between the two trenches, punctuated by shell holes, death and destruction.



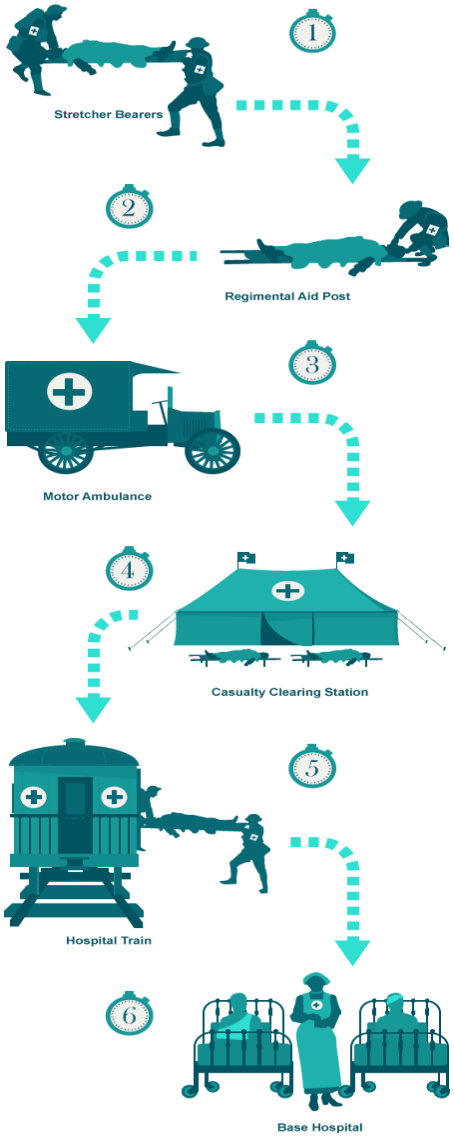
Support Trench
80m behind the frontline trench. Troops would retreat here if under attack. 10% of time here.

Communications Trench
Trenches that run between other trenches, linking them together.

Frontline Trench
Where attacks were made from, the most dangerous area. Only 15% of a soldiers time was here.

Reserve Trench
100m behind the support trench. Where troops would be mobilised to counter attack the enemy if they captured the front line. 30% of time here.

45% of a soldiers time was actually spent away from the trenches.



1. RAP: Regimental Aid Post

- Located within 200 metres of the frontline, in communication trenches.
- The purpose of the RAP was to give immediate first aid and get as many men back to the front as quickly as possible. They could not deal with serious injuries – these were sent to ADS.
- Led by a Regimental Medical Officer with some stretcher bearers.

2. Dressing stations (ADS and MDS)

- There was usually an **Advanced Dressing Station** (ADS) within 400m of the RAP and a **Main Dressing Station (MDS)** about half a mile away, usually in tents or bunker to provide protection from enemy shelling. They could only look after men for a week.
- They were staffed by 10 medical officers, stretcher bearers and nurses too. In total, they could deal with about 150 men but often in battles like Ypres (1917) they dealt with 1,000 causalities in 2 days at Hooge.

3.Casualty Clearing Stations (CCS)

- Around 7 miles away from the front, close to the railway and for ambulance wagons.
- They had several doctors, contained operating theatres, x-ray machines and wards. They could deal with up to 1,000 casualties at a time. At the Third Battle of Ypres the 24 CCS treated over 200,000 causalities with only 4% dying.
- The CCS treated the most critical injuries close to the front. This was important as it would stop gangrene infection and so men could be sent back to the front.
- The CCS had a triage system to assess the wounded into three categories:
  - The walking wounded - patch them up and send back to the front.
  - Those in need of hospital treatment - move to a Base Hospital.
  - No chance of recover y- make them comfortable.

4. Base Hospitals

- Situated near the ports on the French/Belgian coast on trainlines and canals.
- They had operating theatres, x-ray machines, laboratories and even specialist centres for treating gas poisoning and head wounds. These specialist wards allowed doctors to become experts in treatment of particular wounds.
- They could treat upto 2,500 patients at once.
- From here, most patients were sent back to England, those with '*Blighty Wounds*'.

Hospitality and Catering - Nutrition at different life stages

1. Nutrition at different life-stages

Adults:

- Early – Growth in regard to height of the body continues to develop until 21 years of age. Therefore, all micro-nutrients and macro-nutrients especially carbohydrates, protein, fats, vitamins, calcium and iron are needed for strength, to avoid diseases and to maintain being healthy.
- Middle – The metabolic rate starts to slow down at this stage, and it is very easy to gain weight if the energy intake is unbalanced and there isn't enough physical activity.
- Elderly – The body's systems start to slow down with age and a risk of blood pressure can increase as well as decrease in appetite, vision and long-term memory. Because of this, it is essential to keep the body strong and free from disease by continuing to eat a healthy, balanced diet.

Children:

- Babies – All nutrients are essential and important in babies, especially protein as growth and development of the body is very quick at this stage. Vitamins and minerals are also important. You should try to limit the amount of salt and free sugars in the diet.
- Toddlers – All nutrients remain very important in the diet at this stage as growth remains. A variety of foods are needed for toddlers to have all the micro-nutrients and macro-nutrients the body needs to develop.
- Teenagers – The body grows at a fast pace at different times at this stage as the body develops from a child to an adult, therefore all nutrients are essential within proportions. Girls start their menstruation which can sometimes lead to anaemia due to not having enough iron in the body.

2. Special Dietary needs

Different energy requirements based on:

- Lifestyles / Occupation / Age / Activity level

The amount of energy the body needs is determined with each of the above factors e.g. active lifestyle or physical activity level would need more energy compared to a person being sedentary.

Medical conditions:

- Allergens – Examples of food allergies include milk, eggs, nuts and seafood.
- Lactose intolerance – Unable to digest lactose which is mainly found in milk and dairy products.
- Gluten intolerance – Follows a gluten free diet and eats alternatives to food containing wheat, barley and rye.
- Diabetes (Type 2) – High level of glucose in the blood, therefore changes include reducing the amount of fat, salt and sugar in the diet.
- Cardiovascular disorder – Needing a balanced, healthy diet with low levels of salt, sugar and fat.
- Iron deficiency – Needing to eat more dark green leafy vegetables, fortified cereals and dried fruit.

Dietary requirements:

- Religious beliefs – Different religions have different dietary requirements.
- Vegetarian – Avoids eating meats and fish but does eat dairy products and protein alternatives such as quorn and tofu.
- Vegan – Avoids all animal foods and products but can eat all plant-based foods and protein alternatives such as tofu and tempeh.
- Pescatarian – Follows a vegetarian diet but does eat fish products and seafood.

Hospitality and Catering - The importance of nutrition

Listed below are the macro-nutrients and micro-nutrients. You need to know their function and know examples of food items for each. You need to know why they are needed in the diet and why there is a need for a balanced/varied diet.

Macro-nutrients

Carbohydrates - Carbohydrates are mainly used in the body for energy. There are two types of carbohydrates which are:

- Starch - Examples include bread, pasta, rice, potatoes and cereals.
- Sugar - Examples include sweets, cakes, biscuits & fizzy drinks.

Fat - This is needed to insulate the body, for energy, to protect bones and arteries from physical damage and provides fat soluble vitamins. There are two main types of

fat which are:

- Saturated fat - Examples include butter, lard, meat and cheese.
- Unsaturated fat - Examples include avocados, plant oils such as sunflower oil, seeds and oily fish.

Protein - Protein is mainly used for growth and repair in the body and cell maintenance. There are two types of protein which are:

- High biological value (HBV) protein - Includes meat, fish, poultry, eggs, milk, cheese, yogurt, soya and quinoa.
- Low biological value (LBV) protein - Includes cereals, nuts, seeds and pulses

Micro-nutrients

Vitamins

- Fat soluble vitamin A - Main functions include keeping the skin healthy, helps vision in weak light and helps children grow. Examples include leafy vegetables, eggs, oily fish and orange/yellow fruits.
- Fat soluble vitamin D - The main function of this micro-nutrient is to help the body absorb calcium during digestion. Examples include eggs, oily fish, fortified cereals and margarine.
- Water soluble vitamin B group - Helps absorbs minerals in the body, release energy from nutrients and helps to create red blood cells. Examples include wholegrain foods, milk and eggs.
- Water soluble vitamin C - Helps absorb iron in the body during digestion, supports the immune system and helps support connective tissue in the body which bind cells in the body together. Examples include citrus fruits, kiwi fruit, cabbage, broccoli, potatoes and liver.

Minerals

- Calcium - Needed for strengthening teeth and bones. Examples include dairy products, soya and green leafy vegetables.
- Iron - To make haemoglobin in red blood cells to carry oxygen around the body. Examples include nuts, beans, red meat and green leafy vegetables.
- Sodium - Controls how much water is in the body and helps with the function of nerves and muscles. Examples include salt, processed foods and cured meats.
- Potassium - Helps the heart muscle to work correctly and regulates the balance of fluid in the body. Examples include bananas, broccoli, parsnips, beans, nuts and fish.
- Magnesium - Helps convert food into energy. Examples include wholemeal bread, nuts and spinach.
- Dietary fibre (NSP) - Helps digestion and prevents constipation. Examples include wholegrain foods (wholemeal pasta, bread and cereals), brown rice, lentils, beans and pulses.
- Water - Helps control temperature of the body, helps get rid of waste products from the body and prevents dehydration. Foods that contain water naturally include fruits, milk and eggs.

Cooking methods

Boiling

- Up to 50% of vitamin C is lost when boiling green vegetables in water.
- The vitamin B group is damaged and lost in heat. Poaching
- The vitamin B group are damaged in heat and dissolve in water.

Roasting

- Roasting is a method of cooking in high temperatures and so this will destroy most of the group C vitamins and some of the group B vitamins.

Frying

- Using fat whilst frying increases the amount of vitamin A the body can absorb from some vegetables
- Cooking in fat will increase the calorie count of food e.g deep fat frying foods.

Stir-frying

- The small amount of fat used whilst stir-frying increases the amount of vitamin A the body can absorb from some vegetables.
- Some vitamin C and B are lost due to cooking in heat for a short amount of time.

Steaming

- Steaming is the best cooking method for keeping vitamin C in foods.
- Only up to 15% of vitamin C is lost as the foods do not come into contact with water.

Grilling

- Using this cooking method can result in losing up to 40% of group B vitamins.
- It is easy to overcook protein due to the high temperature used in grilling foods.

Baking

- Due to high temperatures in the oven, it is easy to overcook protein and damage the vitamin C and B group vitamins.

Hospitality and Catering - Factors affecting menu planning

1. 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.

2. 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.

3. 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.

4. 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.

5. 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).

6. 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.

7. 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.

8. 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?

9. 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.

10. 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.

11. 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?

Hospitality and Catering - How to plan production

You need to be able to plan dishes for a menu as well as know, understand and include the following:

1. Commodity list with quantities

This means naming all the ingredients needed to make all dishes and how much of each one e.g. grams (g), ounces (oz), millilitres (ml), etc.

2. Contingencies

This means stating, in the plan, what you would do to deal with a problem if something were to go wrong.

3. Equipment list

Naming all pieces of equipment you would need to cook the dishes, which also includes specialist equipment such as pasta machines and ice cream makers as well as saucepans, chopping boards, knives, etc.

4. Health, safety and hygiene

Stating in the plan, points regarding the health, safety and hygiene. The use of temperature probes to ensure foods are cooked, correctly using colour coded chopping boards or washing hands after handling raw meat are a few examples.

5. Quality points

These include naming any quality points to consider in the preparation, cooking and serving stage of the plan. Examples could include checking foods are in use by/best before dates, dishes are cooked to minimum temperatures, ingredients stored in correct places and correct temperature, etc.

6. Sequencing or dovetailing

This means you fit together the different steps and activities in logical order when planning to cook more than one dish.

7. Timing

You need to state realistic timings of how long each step is likely to take throughout your plan to give accurate information of how long your dishes take to complete.

8. Mise en place

This is all the preparation you undertake before cooking. Examples of this include weighing out ingredients, collecting equipment and washing hands.

9. Cooking

Throughout your plan, you will need to state how you ensure food is cooked correctly, e.g. chicken is white in the middle, using a temperature probe, etc.

10. Cooling and hot holding

Cooling dishes correctly within 1.5hrs to 8 degrees and keeping hot dishes for service at 63 degrees should be mentioned in your plan for relevant dishes, as well as how you would ensure these temperatures are met, e.g. by using temperature probes.

11. Serving

Once you have finished cooking your dish or dishes, you need to state how you would present your dish/dishes, e.g. on plate, bowl, etc., as well as what decoration, garnishes and sauces you include before serving.

12. Storage

In your plan, you should state where different kinds of ingredients need to be stored, e.g. raw chicken in the fridge or frozen fruit in the freezer and at what temperatures these pieces of equipment need to be (fridge needs to be 0–5 degrees and freezer needs to be
-18 degrees).

Hospitality and Catering - Practical skills and techniques

1. Skills and techniques

You need to be able to identify the different types of skills you need to produce your selected dishes. Some dishes will require the use of more complex skills. You will need to demonstrate a range of skills when producing your chosen dishes.

Preparation and cooking skills are categorised as follows: basic, medium, and complex.

2. Presentation

You should know and understand the importance of using the following appropriate presentation techniques during the production of dishes:

- creativity
- garnish and decoration
- portion control
- accompaniments.

3. Basic preparation skills and techniques

Blending, beating, chopping, grating, hydrating, juicing, marinading, mashing, melting, peeling, proving, sieving, tenderising, trimming, and zesting.

4. Medium preparation skills and techniques

Baton, chiffonade, creaming, dehydrating, deseeding, dicing, folding, kneading, measuring, mixing, puréeing, rub-in, rolling, skinning, slicing, spatchcocking, toasting (nuts/seeds) and weighing.

5. Complex preparation skills and techniques

Brunoise, crimping, de-boning, filleting, julienne, laminating (pastry), melting using bain-
marie, mincing, piping, and segmenting, shaping, unmoulding and whisking (aeration).

6. Basic cooking skills and techniques

Basting, boiling, chilling, cooling, dehydrating, freezing, grilling, skimming, and toasting.

7. Medium cooking skills and techniques

Baking, blanching, braising, deglazing, frying, griddling, pickling, reduction, roasting, sautéing, steaming, stir-frying, and using a sous vide (water bath).

8. Complex cooking skills and techniques

Baking blind, caramelising, deep fat frying, emulsifying, poaching, and tempering.

9. Creativity

It is said that 'we eat with our eyes'. Creativity in plating dishes enhances the diner's experience – diners want to be 'wowed' when their meal appears!

Serving dishes: Start with the plate – varied sizes, shapes and colours can add immediate impact to your dish. Dishes served in bowls or dessert glasses should be placed on a plate to aid serving.

Elements: Each dish will consist of several elements – the main protein, accompaniments, garnish and decoration.

Volume: Do not overcrowd the plate – leave some space so that the diner can see each element of the dish. The rule of thumb is that only two-thirds of the plate should be full.

Height: Food can be stacked to add height to the overall dish, but each element should be visible.

Colour: Accompaniments, garnishes and decoration can add colour to dishes where the main elements are similar in colour. An example is fish and chips: bright green peas and a slice of yellow lemon will enhance the overall appearance of the meal.

Functionality: The dish should be beautiful to look at, but easy for the diner to eat.

Temperature: Hot food should be served on hot plates. Cold food should be served on chilled plates.

10. Accompaniments

Accompaniments should be chosen to complement the main part of the dish. Examples include:

Carbohydrate accompaniments:

- Savoury: bread, dauphinoise potatoes, pilau rice.
- Sweet: shortbread, brandy snaps, macaron.

Fruit and vegetable accompaniments:

- Savoury: pea purée, roasted root vegetables,griddled asparagus.
- Sweet: berry compote, fruit kebabs, grilled peaches.

Sauces:

- Savoury: gravy, red wine jus, parsley sauce.
- Sweet: custard, salted caramel sauce, chocolate sauce.

Hospitality and Catering - Presentation techniques

1. Portion control

It is important that the customer is satisfied with their ortion without the plate being overcrowded. Keeping portion control accurate allows hospitality and catering provisions to order adequate supplies of ingredients. Accurate portion control will also help prevent food waste.

2. Garnish

Garnishes are additions to a dish which both add to the overall taste and enhance the overall appearance.

Savoury: parmesan crisps, crispy onions, caviar, watercress, lemon wedges, fresh herbs, salsa, edible flowers.

Sweet: chocolate dipped strawberries, tuile biscuits, chopped nuts, tempered chocolate work, spun sugar work, edible flowers.

3. Decoration

Decoration adds drama to the finished dish but it is not meant to be eaten or add to the overall flavour of the dish. Examples include:

- whole spices added to pilau rice
- gold leaf
- hollow eggshell as serving dish.

4.Plating styles

Food Safety

1. Food Safety practices

Personal safety and hygiene practices

Hands:

- Wash before, during and after preparing food especially after touching raw meat, dirty vegetables and fridge handles.
- Wash after going to the toilet.
- Wash after sneezing or blowing your nose.
- Wash after disposing of waste.

Clothing and hair:

- Clean apron and/or chef's whites.
- Non-slip closed-toe shoes.
- Tie hair back.
- Wear a bandana or hair net.

Cuts:

- Cover with a blue, waterproof plaster.

Equipment:

- Handle knives safely.
- Use oven gloves when carrying hot items.
- Keep electrical equipment away from water.
- Clean spills immediately.

2. Food safety and hygiene practices

Ingredients:

- Check use-by and best before dates.
- Check ingredients for freshness; no bruises on fruit, fish should not smell.
- Store correctly until needed.

Cleaning:

- Clean worktops before preparation.
- Clean workstation and equipment after preparing high-risk foods.
- Wash up throughout the session – do not leave it all until the end!

Temperatures:

- Keep high-risk foods in the fridge (0°C – 5°C) until needed.
- Use a temperature probe to check core temperature of high-risk foods.

Waste management:

- Keep waste separate from ingredients during preparation, cooking and serving.
- Recycle and compost waste if possible.

3. Management of accidents

- Ensure that you know the location of the First Aid box.
- Ensure that you know how to use a fire blanket or fire extinguisher.

Hospitality and Catering - Reviewing of dishes

1. Dish production
- Were you able to keep to your time plan?
- Did you have any problems during the practical? How did you resolve them?

2. Hygiene
- Did you follow all hygiene guidelines?
- Did you wear correct PPE?
- Did you wash up between jobs?

3. Health and safety
- Were you able to use equipment safely?
- Did you store ingredients correctly?

4. Dish selection
- Did your dishes contain the right nutrients for your two groups?
- Were they expensive or cheap to produce?
- Did they contain seasonal or local produce?

5. Reviewing of dishes
PEE: Point, Evidence, Explain

You need to write a self-reflection of how you performed during your practical session. There are 8 areas to consider when you write your review of your dishes.

6. Waste
- Did you separate your waste into categories? (Food waste, recyclable materials, general waste.)
- Did you buy the right amount of ingredients?

7. Organoleptic
How did your dishes:
- Look (appearance)?
- Taste (flavour and texture)?
- Smell (aroma)?

8. Presentation
- Were the portions the right size for your two groups?
- How did you add colour to your dishes?
- Were your garnishes and decorations appropriate?

9. Improvements
- If you made your dishes again, what would you do differently?
- If you had to do the task again, would you change your choice of dishes?
- Would you add additional accompaniments?

10. Decision making
- What were your strengths in completing the written tasks?
- What were your strengths in choosing dishes?
- How could you improve weak decisions?
- Were the dishes easy to make together?
- What were the disadvantages of the chosen dishes?
- Did your dishes meet the needs of the provision?
- Did your dishes meet the needs of your two groups (nutrition and cost)?

11. Organistation
How did you organise your written tasks?
- Discuss your strengths.
- Discuss your weaknesses.
- Suggest improvements.

How did you organise your workstation during the practical session?
- Discuss your strengths.
- Discuss your weaknesses.
- Suggest improvements.

12. Planning
Was the practical session plan in a logical order?
- Discuss your strengths.
- Discuss your weaknesses.
- Suggest improvements.

Were you able to keep to the plan during the practical session?
- Discuss your strengths.
- Discuss your weaknesses.
- Suggest improvements.

13. Time management
How did you manage your time when completing the written tasks?
- Discuss your strengths.
- Discuss your weaknesses.
- Suggest improvements.

How did you manage your time during the practical session?
- Discuss your strengths.
- Discuss your weaknesses.
- Suggest improvements.

Performing Arts

2.vocal skills to become a character for rehearsal and performance (using your voice)

Key word	Meaning
Diction and projection	Diction means pronouncing your speech clearly. Projection is making sure your voice can be heard (this doesn't mean shouting).
Emphasis and volume	Emphasis is when you make a word stand out "I never said you stole my hat" is different from "I never said you stole my hat". Volume is how loud or quiet the voice is. Don't forget words such as whisper and shout.
Pitch	Pitch means how high or low your voice is. Low pitch may convey sadness, whilst high pitch could convey joy.
Accent	Accent is the way you pronounce your words. It is used to indicate where a character is from, specifically which country or region. It can help distinguish class and status.
Rhythm and tempo	Rhythm is where we pause and leave gaps in speech. This could show a character is thinking or distressed. Tempo is how fast or slow the speech is. E.g. a fast tempo could show someone is excited, a slow tempo could show someone is sleepy or confused.
Tone	Tone describes the emotion behind the line. It can convey meaning. For example: an angry tone.

2. Physical skills to become a character for rehearsal and performance (using your body)

Key word	Meaning
Gestures	Using your hands to highlight meaning or convey emotion. E.g. Scratching your head if you are confused or Waving to say 'Hello'.
Stance	The way someone stands usually to do with feet positioning. This could be with your feet really wide apart or really close together, for example.
posture and body language	Posture and body language is how you hold and position your body to show emotion or a character's personality.E.g. shoulders back and chest out to show confidence. Hanging head and shoulder may show shame or sadness
Expression	Also known as 'facial expressions'. Using your face to communicate emotions and reactions. Smiling to show happiness, frowning to show anger, raising one eye brow to show confusion for example.
Eye contact	Also known as 'facial expressions'. Using your face to communicate emotions and reactions. Smiling to show happiness, frowning to show anger, raising one eye brow to show confusion for example.
Dynamics and movement	Dynamics means HOW you move. For example, sharply / smoothly. Movement is HOW your character walks. For example, with a limp or taking large steps

Performing Arts

3. Roles for rehearsing and running a Theatre production

Roles	Reponsibilities
Blocking	Working out the movement and positioning of all the actors on stage. WHERE you will STAND and WHEN you will move
Extrances and exits	Where and when you come on and off stage.
Proxemics and use of space	Proxemics is how close or near you are to others on stage. This can help to communicate meaning e.g. if your character is scared of another character you might stand far away. Use of space is where you position yourself on the stage so the audience can see you and others clearly.
Levels	How high or low you are positioned on the stage. This could be to communicate how important you are or to show you are in a different place to other characters.
Audience awareness	How high or low you are positioned on the stage. This could be to communicate how important you are or to show you are in a different place to other characters.
Concentration and focus	Being organised and sensible in your performance and staying in role at all times.
Energy	Putting effort into your performance and making sure you are lively and enthusiastic when you perform.
Set and props interactions	Using the objects on stage confidently to show something about your character or the situation. E.g. snatching a bag of sweets to show your character is greedy.

Religious studies – Relationships and families

1. Sexuality

Human sexuality refers to the way people express themselves as sexual beings. A heterosexual relationship is a relationship with a member of the opposite sex. A homosexual relationship is a relationship with a member of the same sex, either between a man and another man or a woman and another woman.

Christianity: Marriage is the only valid place for heterosexual relationships. Christians are unfaithfulness and Catholics believe that sex before marriage is wrong.

Islam: Heterosexual relationships are allowed and Muslims are expected to marry and raise a family. The only sexual relationship should take place between husband and wife.

Homosexuality is condoned in Christianity when the Bible says that sex between two men is 'detestable.' Roman Catholics may state that the action of sex is the sin and therefore homosexual couples should remain chaste. Muslims may also say that homosexuality goes against natural law and those involved will face God on judgement day.

However, many Christians and Muslims believe we should avoid making judgements and welcome any relationship if it is loving and committed.

2. Homosexuality

Homosexual relationships involves a relationship with a member of the same sex. This was only legalised in 1967 in the UK and in some traditional Muslim countries is still illegal and punishable today. In 2004 same-sex couples were allowed to have civil partnerships (the same sex marriage) but this is not allowed within the Christian church.

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However, many Christians and Muslims believe we should avoid making judgements and welcome any relationship if it is loving and committed.

3. Cohabitation: Living together before marriage.

Christianity:Christians who are opposed to sex before marriage believe cohabitation is wrong. Catholics are opposed to any sexual relationship outside of a marriage. Anglicans accept that although marriage is best, people may live together if they are in a loving relationship. Islam: Believe it's wrong as sex should only occur within a marriage.

4. Contraception

Contraception is a way of preventing pregnancy. There are different methods of contraception: The pill, condoms, injection, etc.

Christianity:

The Catholic Church teach that artificial methods of contraception goes against God's laws as it is the purpose of marriage and sex is to have a family. Only natural forms of contraception are allowed in family planning. Anglicans accept people should have only as many children as they can afford and contraception is therefore permissible before conception.

'Be fruitful and increase in number; fill the earth'. Genesis 2:24

Islam: Contraception is only acceptable in the context of marriage, not for unmarried people. There is an expectation that Muslims will have children, but they believe the couple should be able to decide when to have the family and how many children to have. 'God wishes to lighten your burden.'

5. Purpose of family

The family serves a number of purposes: it controls sexual behaviour, it creates stability for society, it provides protection of children, it is where children learn to relate to others, it helps to provide security for the sick, elderly and disabled and for those who are religious it is where children are educated in the faith.

Christianity: The church advises that both parents have responsibilities when rearing children. Likewise all children should 'honour your mother and father', so it includes the respect and care given to relatives. Regardless, all children are a gift God and should be brought up to the Islamic or Christian faith.

6. Polygamy

Polygamy is where a man or a woman has more than one married partner. If it is done in secret this is bigamy. It is illegal in the UK. Christianity: Christians believe that the ideal marriage is between one man and one woman.

Islam: Islam allows for a man to have more than one wife at a time. The Prophet Muhammad had several wives. The first wife has to consent.

7. Divorce and remarriage

Divorced can be filed one year after marriage and can only be sanctioned by a court. People divorce for a number of reasons such as: addiction, abuse, falling out of love, inability to have children, financial pressures and adultery. People can get married as many times as they wish to their original or a different spouse.

Christianity: Jesus taught that anyone who divorced and remarried was committing adultery as they are still married in the eyes of God. Some Christians argue if it is the lesser of two evils (for example, a partner is suffering abuse). Islam: Divorce is allowed in Islam but is not favourable and all attempts of fixing broken relationships should be made. If this does not work then an abortion may go ahead. However, they have to wait for three months before the divorce is finalised to ensure the women is not pregnant and that they are certain (Iddat).

8. Gender equality

- Gender equality means that men and women should be given the same rights and opportunities as each other. Gender prejudice and sexual stereotyping often prevents equality between genders.
- Traditionally, men held more positions of power and had more rights than women. Christians believe that both men and women are created in the image of God, however, each have different gifts. Women have the role of rearing children. 'With painful labour you give birth to children. Your husband will rule over you.'
- Muslims respect women both before and after marriage and place high value on the mothers role in raising children and educating them in the ways of Islam. 'You were created a single man and single woman and created into races and tribes.'

9. Sex before and outside of marriage

The Anglican and Catholic Churches and Islam teach that sex before marriage is wrong. In the past, sexual relationships outside of marriage was considered shocking, especially for a woman. In Britain, sex before marriage is now widely accepted but adultery (sex outside of marriage) is generally considered to be wrong. Muslims believe casual sex is wrong. They believe it can lead to promiscuity and other evils such as rape and deception. Under Islamic law, it is a sexual offence. Christians believe adultery (cheating) is wrong because it involves secrecy, lies and a betrayal of trust.

Sex outside of marriage:

- ✓ Adultery is considered a serious sin. Muslims should avoid situations which could lead to this sort of sin.
- ✓ They believe it is wrong because it is a betrayal of trust and goes against the marriage promises.
- ✓ In some countries governed by Shari'ah law the punishment for adultery is death, though it is hard to get caught.
- ✓ 'And do not go anywhere near adultery: it is an outrage, and an evil path'. Qur'an 17:32

10. Purpose of the family

They place very high value on family life, as love is at the heart of all relationships and this is where children learn to love. Christians believe it's important to look after the elder generations of the family and to respect their parents because of the commandment 'honour your mother and father'. For Muslims the extended family is the basis of Islamic society and part of God's plan. The family shapes the moral values and character of the child and the role of the mother is very significant in shaping the lives of children, whereas husbands are seen to be the main providers of the family. 'Heaven is under the feet of the mothers'.

Religious studies – Religion and life

1.Euthanasia

Euthanasia is illegal in the UK, It can be seen as assisted suicide, therefore breaking the Suicide Act of 1961. It can be viewed as manslaughter or murder and carries a prison sentence.
Some people believe that people should have the right to end their own life if they are terminally ill, incapacitated or in severe pain. This is known as euthanasia. In the UK, this is currently against the law, although in some other countries it is legal (Switzerland, Netherlands and Belgium). Some Christians believe that people should not be able to end their own life because all life is sacred, and that the terminally ill should be cared for in hospices at the end of their lives.Islam tells us that Euthanasia is zulm: wrong doing against Allah.
Active euthanasia: being given lethal drugs to end a persons life so there illness does not kill them.
Passive euthanasia: a person stops taking medication to end their life.
Voluntary euthanasia: The ill person asks for their life to be ended
Involuntary euthanasia: The person is capable of expressing a choice but is not given the opportunity to do so
Non-voluntary euthanasia: The person is unable to express a choice e.g. in a coma
"Treat others as you wish to be treated."
"Whoever takes an innocent life, it is as though they have killed all of mankind."

2. Sanctity of Life

Many religions believe that life is sacred because God created it, including Islam and Christianity. Christians believe that all life is sacred, and precious. Some Christians do not believe that anyone should take their own life or the life of someone else. Therefore some Christians believe that euthanasia and abortion is wrong, as it is wrong to end a human life. In all legal systems murder is the worst crime you could commit.
"God created man in his own image."
"Allah gives life, and Allah shall take away."

3.Use and abuse of animals

Many medicines are tested on animals before they can be used on humans to ensure that they are safe. This is very controversial because many people think that it cruel and unnecessary. However others believe that animal experimentation is necessary to make breakthroughs in science and technology, and to manufacture effective cures. For example many surgical procedures such as transplantation surgery were traditionally perfected on animals.
Vivisection: Testing on animals for medical purposes.
Cosmetic testing: Testing on animals for the purpose of developing cosmetics safe for human use. This is currently illegal in the UK.
Christians and Muslims are allowed to eat meat in their diets, although Muslims do not eat pork and some Christians fast during Lent.
Vegetarian: a person who does not eat meat.
Vegan: a person who does not use or eat any animal product
Halal: Anything, including meat, that is permitted in Islam. This has to be slaughtered in a specific method.
"The righteous care for the needs of their animals."

4. Abortion

The law defines abortion as **"**the deliberate expulsion of a foetus from the womb, with the intention of destroying it**"**. In the UK abortion is allowed up until 24 weeks of a pregnancy under special circumstances, i.e. if two registered doctors agree that there is a danger to the women's mental or physical health, the foetus will be born with disabilities, or the mental or physical health of existing children will be put at risk. Some people do not believe that abortion is right because it means terminating the life of an unborn child. However, many people believe that it is the woman who should have the choice as to what happens to her body is her own choice (autonomy). There are also circumstances such as rape, genetic abnormalities or failed contraception which cause debate on both sides of the argument.In Islam, the life of the mother takes precedence – she is a fully developed human with rights. Muslims accept abortion for the first 120 days before the period of ensoulment (when the fetus is believed to have a soul).
Pro-Life: term used for arguments against abortion
Pro-choice: arguments in favour of having the CHOICE to choose an abortion

5 . Stewardship and Dominion

Stewardship: the idea that God created the world and that humans have a responsibility to look after it.
Dominion: the belief that God gave humans the right to rule the world and the species in it.
Khalifah: The Islamic view that Muslims have a duty to protect
"Rule over the birds of the air and the fish of the sea, and every other creature."

6. Use and abuse of environment

There are several types of pollution including; air, land and water. These are caused by poor disposal of waste, dumping waste into the oceans, and through fumes coming from factories and transport. These types of pollution are a real threat to life on earth and lead to climate change,
Religious response: Christian groups such as 'Alliance of Religions and Conservation' and 'Friends of the Earth', and Islamic groups such as 'The Islamic Foundation for Ecology and Environmental Sciences' all work towards protecting the Earth (God's creation) and encouraging others to.

7. Origins of the Universe

Some Christians believe that the universe was created by God in 7 days. This is described in the Bible in the book of Genesis**.** The Bible says that Adam and Eve were the first man and women. Christians who believe the literal truth of the Bible are known as Creationists**.** Other Christians think the creation story is a metaphor for the creation of the Universe, but do not believe that the world was created in 7 days. Scientists believe that the Universe was created billions of years ago and is constantly evolving. This is known as the Big Bang Theory. Charles Darwin was a famous scientist who came up with the theories of evolution and natural selection. This theory explains that humans are descended from apes and that species are constantly evolving to adapt to their changing environment.
The origins of human life: Evolution
The evolution theory confirms that humans were not created in a day as per the Genesis story. Instead, they developed from single celled beings over millions of years. This, for scientists, is proven by fossils and the fact many animals continue to evolve.

8. Quality and Value

Quality of life**:** How good or comfortable ones life is
Value of life**:** God gave human life great value, we should respect that in our actions. This explicitly links to the sanctity of life – the view that all life is sacred and a gift from God.

9. Death and the afterlife

Both Christians and Muslims believe that the result on ones actions in life is where you will spend eternity. Judgment is very important in both faiths, and both believe you should spend your time on earth trying to achieve a place in heaven or paradise.
"Heaven is a blissful paradise."

Religious studies – Religion, peace and conflict

1.Violence & violent protest

Christianity teaches non-violence, as Jesus said "Blessed are the peacemakers" and told others to turn the other cheek in the face of violence. Christians are told to love their enemies and love each other. However, God gave humans free will and choice and sometimes non-violent protest is ignored, so violence may be used to force change for the common good. Dr Martin Luther King is an example of a Christian who used peaceful protest to bring civil rights to black Americans – he did not believe in using violent methods.

Islam means peace and Muslims should act in a peaceful manner, but violence may be used in self-defence. Muslims have a duty to protest about anything unfair and in the UK we have seen protests over wars and issues in the Middle East, what is perceived as Islamophobia, terrorism and racism issues.

"Blessed are the peacemakers."

2.Just War & Holy war

Holy war = A war sanctioned by a religious leader or God.

Some Muslims believe a holy war is a just war. There are rules for how Muslims should fight a war in the Qur'an according to lesser Jihad.

There have been many examples of Holy wars in history. For example the Crusades.

Just war = A war fought for the right intentions and in the right way.

C -There must be a just cause. e.g. self defense.

L - The war must be a last resort – all other ways of ending conflict have tried and failed.

I - The war must be fought for the right intention (reason). EG – to bring about peace.

P - Methods must be proportional – e.g. it is not fair to use nuclear weapons against a country because it had invaded a small island.

S -There must be a reasonable chance of success. Only a proper legal authority. International agreed conventions must be obeyed.

"I the Lord love justice."

3.Peace & justice

Justice = fairness; Peace = to live in harmony & without fear

Christians will fight for justice under the conditions of The just war theory. Whilst God desires peace, He also desires that humans should live in justice and freedom.

"There is a time for love and a time for hate, a time for peace and a time for war."

Many Christians also believe it is permissible to break a law to get a bad law changed. For example, Martin Luther King and Rosa Parks broke the segregation laws which oppressed black people in America. Some Christians believe we should always follow the law. Jesus said, *'Those who refuse to obey the law of the land are refusing to obey God, and punishment will follow."*

5.Pacifism

Pacifists believe that all violence is morally wrong. They will not participate in any war, regardless of the reasons. An example of a pacifist Christians are The Quakers.

Conscientious objectors are people who refuse to participate in fighting wars on the grounds of conscience. However, they will assist in non-military ways such as medics, relief work and mediators. Many believe they have a peace-keeping role.

The Church of England accepts the Just War theory and sees wars as necessary in certain conditions, especially in situations where wars are to fight injustice.

The Muslim Peace Fellowship (Muslim) work against injustice in the world.

6.Terrorism

Some individuals or groups use terrorism to further their cause by killing innocent people – the aim is to make society aware of their cause, make people frightened and push the authorities into giving into their demands. Terrorists may link their cause to religion but no religion promotes terrorism in either Christianity or Islam. This is because it is forbidden to kill innocent people in any form of conflict and terrorism is the indiscriminate killing of innocents.

"He who kills an innocent man will be treated as though he has killed all of mankind."

4.Forgiveness & reconciliation

Reconciliation = making up between two groups after a disagreement

Forgiveness: A conscious, deliberate decision to release feelings of resentment or vengeance toward a person or group who has harmed you. Jesus set a standard for forgiveness He died for the forgiveness of human sin and forgave those who crucified him.

"Forgive them Father, they do not know what they have done."

"Forgive seventy times seven" ~ Jesus

"Love your enemies, and pray for those who persecute you" ~ Jesus

8.Religion & peace making

Christianity teaches to "love your neighbour" and Islam means peace if both of these teaching were adhered to then there would be peace. Religious groups are regularly involved in peace-keeping in war torn areas and in negotiations to prevent wars happening.

On occasions people have claimed that religion is the cause of war. For example, some fundamentalist groups such as ISIS believe that an Islamic State needs to be created. Other conflicts, such as 'the Troubles' in Northern Ireland, see groups of the same faith fighting each other – in this case, Catholic and Protestant Christians. Much of this is based on political views, rather than teachings of the faith itself.

Corrymeela is Northern Ireland's oldest peace and reconciliation organization. They were important in helping resolve the troubles in Northern Ireland, and today continue to develop strategies to stop conflict and allow groups to reconcile.

"Sometimes even with all the best efforts, religion cannot keep peace because of overriding factors, such as the craving for power, the need to react, attack or join allies to protect others.

7.WMD

Weapons of mass destruction are capable of killing & maiming large groups of people. These weapons are considered unjust because they kill civilians. Some religious believers accept the existence of nuclear weapons as a deterrent. Nuclear, Biological and Chemical weapons are all considered WMDs. CND (Christians for Nuclear Disarmament) – An organisation which fights to persuade all governments to disarm (get rid of) all chemical weapons to avoid any chance of a nuclear war, or an accidental explosion. Some religious people allow possessing WMD's but only as a deterrent to stop other attacks. They should never be used due to their capacity to devastate human life.The Quaker Society utterly condemn WMD. They are pacifists, and no outward weapons are acceptable. WMD are indiscriminate and beyond control.

9. Working for peace in contemporary society

Religious organisations which work for world peace and to provide support for victims of war is Christian Aid and Islamic Relief. They provide both long term and short term aid and petition to the governments when they feel conflict is avoidable or is having devastating impacts on civilian life.

Contemporary individuals who works for peace are:

One religious believer working for world peace is Pope Francis who regularly makes statements calling for peace between different countries or religious groups. For example he sent a message to Syria on Christmas day calling for an end to the conflict. He is inspired by the teaching of Jesus 'Blessed are the peacemakers'. Another religious believer is Malala who fights for peace by trying to protect human rights. By fighting for education for all she can end the ignorance which leads to conflict between religions.

Religious studies – Religion, crime and punishment

1. Good & evil actions and intentions

Some people suggest that those who commit the worst crimes are evil.

But where does evil come from?

Christianity: Evil is seen as the abuse of the free will God gave to humans. In order to be able to appreciate good, then evil has to exist. Most Christians believe in a figure called the devil or Satan. So, evil is a combination of internal and external factors.

Islam: The Qu'ran says there is a devil who was an angel. Iblis was expelled from paradise he refused to bow to Adam. Iblis continually tempts and punishes humans to be wicked. Evil is a mix of powerful evil being and the weakness of humans.

2. Aims of punishment

Retribution: is the least positive of the 3 aims of punishment.

It means that society, on behalf of the victim, is getting its own back on the offender. In the Old Testament it says **"**An eye for an eye, a tooth for a tooth**"**

Deterrence: This is the belief that if offenders are seen to be punished for wrongdoing, then this may 'put off' others from committing that offence. The offender themselves might also be put off from reoffending.

Reformation: This is the aim of punishment most Christians prefer because it seeks to help offenders by working with them to help them understand that their behaviour is harming society. It is hoped that offenders will change their attitudes and become responsible, law-abiding members of the community.

4.Religious attitudes to different types of crime

Hate crimes are widely condemned by both Christians and Muslims, Jesus specifically taught to love thy neighbour which means everyone.

Murder is wrong and a grave sin because both Christians and Muslims believe only God has the right to take life. Neither Muslims nor Christians permit theft, even as a means to provide for ones family

5.Treatment of criminals

Christians do not disagree with discipline. They see a positive need for it, however, they may question the method used since Jesus' teachings on love and caring for people rule out any physical punishment. Instead, Christians focus on positive sanctions that help offenders to realise the error of their ways and reform.

Corporal punishment: to punish the offender by causing physical pain. It is illegal in the UK but allowed in some other parts of the world. Some Muslim countries such as Iran and Saudi Arabia, allow caning as punishment for offences such as gambling and sexual promiscuity.

Community service: offers offenders a chance to make up for what they have done and receive help in reforming their behaviour. Christians are in general agreement that it is a suitable punishment for fairly minor offences.

Prison: Prison involves loss of liberty in response to serious crimes. Many Christians support prison if it is for the purpose of reformation and the conditions are reasonable.

6. Suffering

For many people, suffering is an unfortunate part of living. It may be caused by something natural, such as an illness, or it may be due to how people have behaved. Whatever the cause, Christians believe they should try to help others who are suffering. Christians feel that they should follow the example of Jesus, who helped many whom he saw were suffering, and who taught that those who believe in God should help those who suffer.

Why do we suffer?

Christians – Free will means we can make our own decisions, including the wrong ones, suffering can be seen as a test from God, and suffering can make us stronger **"**we also glory in our sufferings, because we know suffering produces perseverance**"**

Muslims – Also believe free will means suffering is down to our actions, Allah allows suffering for unknown reasons, suffering can be a test from God or temptation from Iblis (Satan), God will never allow someone to suffer more than they can endure

3.Reasons for crime & types of crime

Causes of crime include: upbringing, mental illness, poverty, opposition to existing laws, greed/hate, or addiction.

There are 3 key types of crimes: Crimes against the person (e.g. murder); Crimes against property (e.g. burglary); Crimes against the state (e.g. terrorism).

St Paul tells Christians to "obey the laws of the land"

Many Christians believe that we should support prisoners such as Prison Fellowship, an organisation which helps reform and support both the prisoner and their families by getting them qualifications and counselling.

7. The death penalty

Abolished in the UK in 1965 and is now illegal in many EU countries.

The Principle of Utility = an action is right if it promotes the maximum happiness for the maximum number of people.

The sanctity of life = God gave life, so only He has the right to take it away.

For	Against
• It is a justifiable retribution for serious crimes • It is a deterrent • It gives the victim's family a sense of justice	• Only God has the right to take life • Jesus taught a message of love and forgiveness • It is hypocritical

8. Forgiveness

Forgiveness is a core Christian belief and one Jesus emphasised in his teachings.

Christians are expected to be forgiving towards those who wrong them, if they expect to be forgiven themselves*:* "Forgive us our sins, as we forgive those who sin against us".

Many Christians would argue that forgiveness is not a replacement for punishment.

During his ministry Jesus was asked how many times you should forgive someone who wrongs you and he replied "I tell you not seven times, but seventy-seven times"

Spanish

Classroom language

Español	Inglés
¿Cómo se dice... en español/inglés?	How do you say... in Spanish/ English?
¿Cómo se escribe...?	How do you spell...?
¿Cómo se pronuncia?	How do you pronounce (it)?
¿Me das .... ?	Can you give me...?
¿Puedes repetir?	Can you repeat that?
¿Puedo ir a mi clase de música?	Can I go to my music class?
(No) entiendo	I (don't) understand
Lo siento	I'm sorry
(Casi) he terminado	I have (almost) finished
por favor	please
gracias	thank you
Objetos en la clase	Classroom objects
un bolígrafo	a pen
una regla	a ruler
un cuaderno	an exercise book

Question words

Español	Inglés
¿Qué?	what
¿Cómo?	how
¿Por qué?	why
¿Dónde?	where
¿Adónde?	where to
¿De dónde?	where from
¿Cuándo?	when
¿Cuánto/a?	how much
¿Cuántos/as?	how many
¿Cuál?	which
¿Quién?	who
¿A qué hora?	at what time

Phonics - Sound Symbol Correspondence (SSCs)

These sounds never change!

a = cat e = egg i = feet o = hot u = woo

ca - ce - ci - co - cu
Stick your tongue out like the English /th/ for /ce/ and /ci/ and also z, /que/ = ke - /qui/ = key

ga - ge -gi - go - gu
Soft /g/ sound, except for /ge/ and /gi/ these are pronounced like a Spanish /j/ in the back of your throat. Soft /gue/ = get and /gui/ = geese

h = silent, ll = like an English y, v like an English b, ñ = ny, roll your rs if they come at the beginning of a word, or are a double rr

Spanish

Future plans

De vacaciones	On holiday
¿En qué trabajas?	What is your job?
El año que viene	Next year
Los fines de semana	At weekends
Soy / es	I am / he/she is
Me gustaría ser	I would like to be
Me interesa ser	I'm interested in being
cantante	singer
Escritor(a)	writer
Amo/a de casa	House wife/ husband
Médico	doctor
policía	Police officer
1.	
2.	
3.	

Higher education

Un anuncio de trabajo	A job advert
Enseñanza superior	Higher education
Un puesto de trabajo	A job / position
En paro	Unemployment
Experiencia laboral	Work experience (general)
Prácticas laborales	Work experience (via school)
Formación	Training
Carta	letter
Un anuncio de trabajo	A job advert

Essential verbs

¿Qué hiciste?	What did you do?
fui	I went
fue	it was
vi	I saw
tuve	I had
hice	I did
lo pasé bomba	I had a blast
lo pasé mal	I had a bad time
me divertí	I had fun
había	there was/were

Work experience

El verano pasado	Last summer
El año pasado	Last year
Hice	I did
Trabajé en	I worked in
Una granja	A farm
Una fábrica	A factory
Una tienda benéfica	A charity shop
La empresa de mi madre	My mum's company
Un taller	A workshop
Mi jefe / jefa era	My boss was
Mis compañeros eran	My colleagues were
Aprendí a	I learned to
trabajar en equipo	work in a team
usar	use

Key verbs

Suelo	I tend to
solía	I tended to
Debo	I must
Hace falta	It's necessary
Tengo que	I have to
Tenía que	I had to
Tendré que	I will have to
trabajar	To work
ser	To be
ayudar	To help
aprender	To learn
cuidar	To look after
enseñar	To teach
preparar	To prepare
Servir (1236)	To serve
cortar	To cut
vender	To sell
empezar	To start
terminar	To finish
pasear	To (take for a)walk
hacer	To do / make
solicitar	To apply
llegar	To arrive
Salir	To leave
llevar	To wear

Part time jobs

¿Tienes un trabajo a tiempo parcial?	Do you have a part-time job?
¿Qué haces para ganar dinero?	What do you do to earn money?
Trabajo de	I work as
Paso la aspiradora	I do the hoovering
Es un trabajo	It's a job
Con responsabilidad	With responsibility
Contestar llamadas	Answer the phone
Cuidar las plantas	Look af terh plants
Hacer entrevistas	Do interviews
Preparar platos	Prepare dishes
Servir comida	Serve food
Vender ropa	Sell clothing
De marca	designer

What type of person are you?

Creo que soy	I think that I am
Fuerte	Strong
Trabajador(a)	hardworking

Key adverbs

a menudo	often
a veces	sometimes
demasiado	too
en seguida	straight away
más	more
menos	less
no obstante	nevertheless

Spanish

Learning languages

¿Por qué aprender idiomas?	Why learn languages?
Aumenta tu confianza	It increases your confidence
Mejora	It improves
Te abre la mente	It opens your mind
Te ayunda a...	It helps you to...
Te permite...	It allows you to...
Conocer a mucha gente distinta	Meet lots of different people
Encontrar un trabajo	Find a job
Descubrir nuevas culturas	Discover new cultures
Hacer nuevos amigos	Make new friends
Mejorar tu lengua materna	Improve you first language
Trabajar en el extranjero	Work abroad
Me hace falta saber hablar	I need to know how to speak
Idiomas extranajeros	Foreign languages
Hablo un poco de...	I speak a bit of...

Superlatives

lo bueno	the good thing
lo malo	the bad thing
lo mejor	the best thing
lo peor	the worst thing

Personalisation
1.
2.
3.
4.

The role play - questions

cuánto tiempo	How much time / how long?
a qué hora	At what time
cuándo	when
cuál(es)	Which
a dónde	Where to
cuánto	How much
con quién	Who with
con qué frecuencia	How often
por cuánto tiempo	For how long
¿qué hacía cuando...?	What were you doing when..
describe lo que pasó	Describe what happened
háblame de la última vez	Talk about the last time...
háblame sobre	Talk to me about ...

Where

aquí	Here
allí	there

Personalisation
1.
2.
3.
4.
5.
6.

The role play - verbs

empezar/comenzar	To start
terminar/ acabar	To finish
pagar	To pay
venir	To come
volver	To return
devolver	To become
cerrar	To close
abrir	To open
abre	It opens
cierra	It closes
quedarse/alojarse	To stay
se queda/se aloja	He / she stays
has hecho/ ha hecho	Have you done..
me recomienda	Recommend to me ..

When

mañana	Tomorrow
la mañana	The morning
último	Last
ya	already
hasta ahora	until now
hora de almuerzo	lunch time

The role play - vocab

razón	Reason
tipo	Type
precio	Price
tamaño	Size
lengua	Language
reserva	Reservatino
intercambio escolar	School exchange
viaje	Journey
nombre	Name
número	Number
datos de contacto	Contact details
instalaciones	facilities
excursiones	Trips / excursions
fecha	date
mesa	table
salida	exit
llegada	arrival
billete	ticket
entrada	ticket
tarjeta	card
destino	destination
recorrido	journey
almuerzo/comida	snack / lunch
cena	dinner
paga	pay

Sports – Basketball

Key Knowledge, Skills and Tactics

1. Advanced shooting skills – combining all shooting skills to become more advanced and allow for more creativity in shooting to be used. Shooting from varieties of angles and distances.
2. Offensive skills - using skills such as passing, receiving, dribbling, rebounding and shooting (all forms) to maximize the effectiveness of offensive skills.
3. Creating space and movement – being able to work collectively as a team, both on and off the ball, to create space around the basket for your team to travel into, creating scoring opportunities
4. Attacking and defensive plays – creating plays both attacking and defending that will work effectively. These patterns of play will be rehearsed and understood by all members of the team so that they work smoothly.
5. Officiating - being able to take a role as an official to run your own match enforcing the laws of the game you have learnt through your basketball lessons throughout school
6. Defensive strategies - tactics created by the squad/team regarding how they will go about defending the basket, regaining possession of the ball and stopping the opposition from shooting.
7. Offensive strategies - tactics created by the squad/team regarding how they are going to work opportunities to shoot towards and score through the basket and outwitting the defenders.
8. Peer evaluation and coaching – being able to take a step back and observe your peers and then give feedback (both positive and negative) to help construct your peer's performance.

Key Vocabulary

Hook shot
Confidently perform
Give and go
Incorporate

Man to man defence
Defensive strategies
Roles and responsibilities of each position

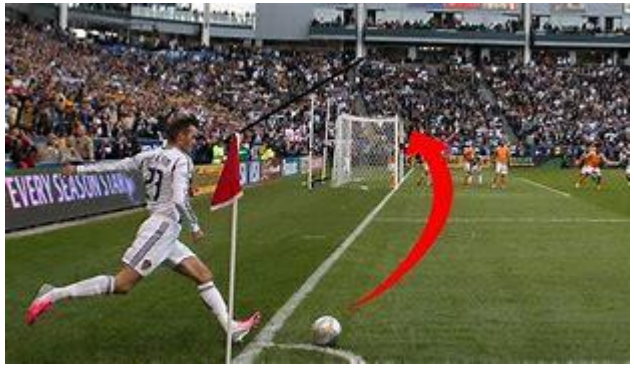
Sports – Football

Key Knowledge, Skills and Tactics

1. Defending strategies and skills (jockey, closing down) – creating and mastering ways in which you and your team can defend against an opposition, win the ball back, and prevent them from scoring. Jockeying the attackers by standing them up and not committing to a change of direction. Closing down the angle so that they have less of an option in terms of passing and shooting angles, reducing options when you're on the ball.
2. Attacking strategies and skills - creating and mastering ways in which your team can attack against an opposition, to create and clinically complete scoring opportunities.
3. Free kicks (set plays) - creating routines for free kicks, corner kicks and throw ins, that will enable scoring opportunities to be produced.
4. Games (full-sided) - beginning to implement skills, techniques and tactics into full sized games that enable all knowledge learned in KS3 to be drawn together and applied in real-life, competitive examples.
5. Formations - setting up your team in a structured formation and shape with each individual having roles within the team.
6. Officiating – understanding rules learned in KS3 to begin officiating matches being played by peers. Applying laws of the game with confidence

Key Vocabulary

Accurately replicate
Jockeying
Channelling play
Goal side
Tracking
Angled running
Direct and indirect free kicks
Set plays
Defensive strategies
Tactics
Formations
Officate
Evaluate
Analyse
Observe
Leading
Rules



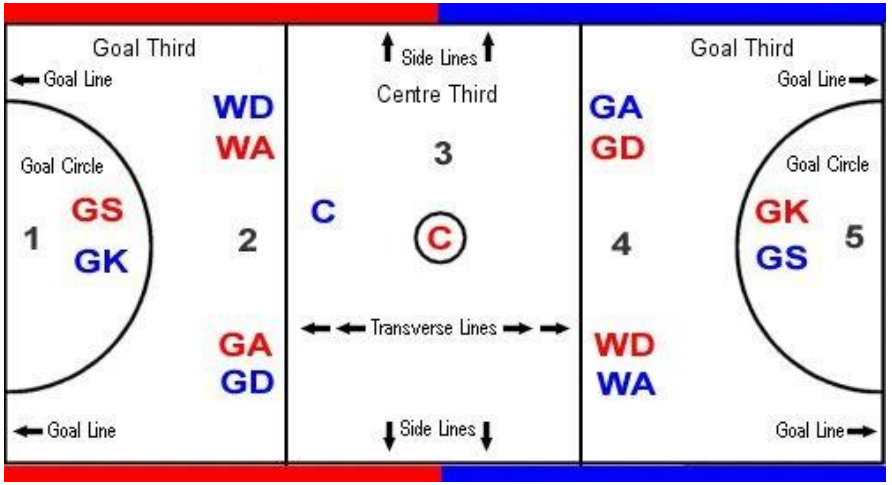
Sports – Netball

Key Knowledge, Skills and Tactics

1. Games – being able to apply all the skills learned through years 7-10 into matches that closely replicate a high-standard netball game. These could begin of a small-sided nature (5-a-side = losing the wing positions)
2. Full-Sided Games – including all positions into matches, to again apply skills into games replicating a professional structure.
3. Peer Performance observation and Coaching with Full-Sided Games - Watching matches being played by peers and offering your knowledge and understanding you have acquired during years
4. Competition – playing games in a competition format to add an extra sense of motivation and opportunity for reward for successful skill application in games.
5. Defensive Strategies and Games – understanding, creating and applying defensive strategies in an attempt to keep the opposition away from the shooting zone and hoop. By being able to work together effectively, you will reduce the number of goals scored by the opponents and therefore reduce the task on hand for your attack to outscore the opposition.
6. Offensive strategies – creating and performing attacking set plays or strategies that will allow for more shooting opportunities to be afforded. This will give your attacking players more chances to shoot and be successful and put your team in an advantageous position in the match.
7. Officiating and coaching – using your knowledge of the rules to officiate a game by following the laws, and ensuring the game is played fairly and safely. Using tactical awareness and your knowledge and understanding to act as a coach, to take control of a team and instruct them to complete strategies and techniques that will lead to success.

Key Vocabulary

Officiating
Coaching
Strategies
Tactics
Offensive strategies
Peer observation
Coaching skills
Technique and tactic skills
Competition



Sports – Rugby

Key Knowledge, Skills and Tactics

1. Forwards and backs (roles and responsibilities) - understanding the difference between a forward and a back and the responsibilities for these players within the team. A back will require kicks and open field play skills more often, whereas a forward will engage in the scrums and ground play.
2. Attacking plays – creating attacking tactics that can afford greater opportunities for you to create scoring chances. By working on these as a team you can all be on the same wavelength and make them more effective.
3. Strategies and Set Pieces within game situations – applying strategies that have been spoken about and created into game situations so that they can be rehearsed and evaluated.
4. Competition – adding skills into competitive environments.
5. Set Play – working on the break downs, when set plays can be used to restart play or create future plays in the game. Understanding how to attack and defend set plays.
6. Officiating – learning the rules of the game and being able to enforce them as an official when peers play in small sided games.

Key Vocabulary

Competition
Confidently perform
Phases
Attacking play
Positional responsibilities
Open play
Defence
Evaluate
Analyse
Officiate
Tactics