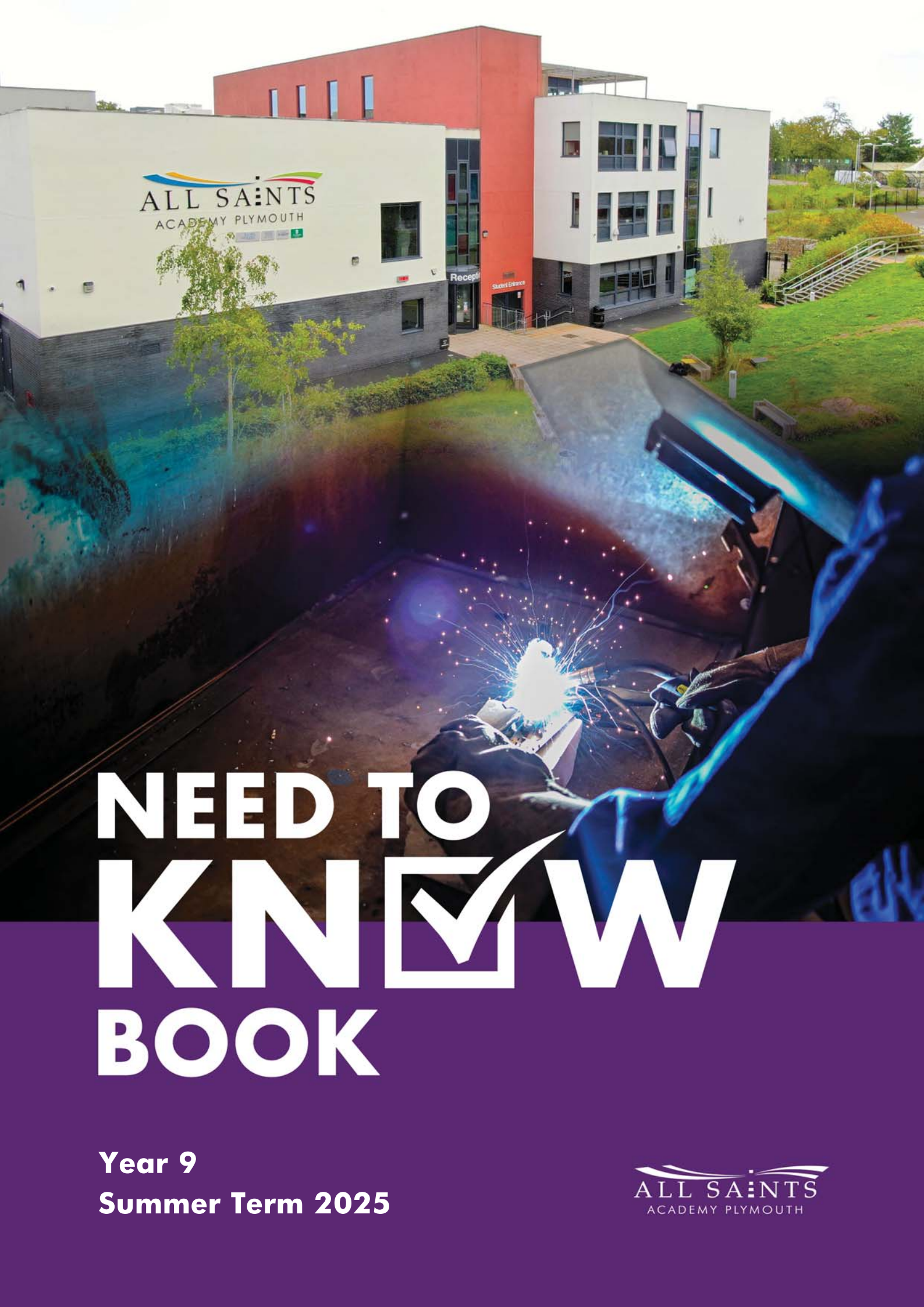


The background of the cover features a photograph of All Saints Academy Plymouth, a modern school building with white and red walls. In the foreground, there is a close-up of a person welding, with bright sparks flying from the welding torch. The bottom half of the cover has a solid purple background.

ALL SAINTS
ACADEMY PLYMOUTH

NEED TO KNEW BOOK

Year 9
Summer Term 2025

ALL SAINTS
ACADEMY PLYMOUTH

Table of Contents

Timetable	2
Homework Expectations	3
Reflection Sheet	4
Improving Your Long Term Memory	6
Careers and Aspirations	7
<i>Need to Know Booklets</i>	
Art & Design	8
Design and Technology	10
English	12
Food Technology	13
French	15
Geography	17
History	19
ICT	21
Mathematics	22
Physical Education	24
Religious Studies	25
Science	27
Need to Know Dictionary	36

Timetable

Week A

Period	Monday	Tuesday	Wednesday	Thursday	Friday
1					
Breaktime					
2					
3					
Tutor/Lunch					
4					
Extra Curricular					

Week B

Period	Monday	Tuesday	Wednesday	Thursday	Friday
1					
Breaktime					
2					
3					
Tutor/Lunch					
4					
Extra Curricular					

Homework Expectations

You are expected to complete up to 1 hour of Homework per night. This is split into 3 subjects at 20mins each.

	3 x 20 Minute Sessions		
	Subject 1 20 mins	Subject 2 20 mins	Subject 3 20 mins
Monday	Sparx Reader	Science	Science
Tuesday	Sparx Reader	Geography	French
Wednesday	Sparx Reader	Maths : Sparx	History
Thursday	Sparx Reader	Maths : Sparx	RE
Friday	Sparx Reader	Maths : Sparx	

Where is my homework?

Maths



Your maths homework is found at www.sparxmaths.uk. You will complete your Compulsory Homework on a Monday. If you have completed over 80% and are stuck on your last few questions, your teacher will help you on Tuesday.

Sparx Reader

Sparx Reader

Your Sparx reader homework is found at www.sparxreader.com. You will complete 20 minutes of reading every day Tuesday – Friday. You can, of course, complete more if you like!

Science



Educake

Your Science homework can be found at www.educake.co.uk. You will answer a series of questions once a week. When it comes to revising, you will have the option of picking a topic, reading an overview, and taking a quiz.

English, History, French and RE

Homework for these subjects will be found in your Google Classroom in the form of a quiz. These quizzes are to test that you have learned the knowledge in your Need to Know booklet. We have high expectations of you and expect students to try their best and achieve the best possible marks. We will give rewards for excellent attainment and we will help everyone achieve by using after school interventions to make sure no one falls behind.



At All Saints, we are organised and don't make excuses for ourselves. If we know we have evening plans, we complete our homework the night before to make sure we are free to go to our planned event. We always want the best for ourselves and my teachers want the same.

Reflection Sheet

Name:

Tutor:

Year:

Use this reflection sheet to track your progress and attitude to learning score after each progress check. This sheet will be used in your parent evening meetings with your teachers to discuss your areas of strengths, weaknesses and ways to improve. If your average attitude score is below a certain average your parents will be called in for a meeting with your Head of house and SLT member.

ATL SCORES	What will I get at GCSE?
0-1	Students who achieve an average of 1 or below usually leave school with no GCSEs.
1-2	Students who achieve an average of 1-2 usually leave with 1s or 2s (E or F) at GCSE
2-3	Students who achieve an average of 2-3 usually leave with 2s or 3s (D or E) at GCSE
3-4	Students who achieve an average of 3-4 usually leave with 3/4/5s (C or D) at GCSE
4-5	Students who achieve an average of 4-5 usually leave with 6/7/8s at GCSE

Average attitude to learning score	Term 1	Term 2	Term 3	Term 4

Subject rank	Subject Maths	Subject English	Subject Science	Subject	Subject	Subject	Subject	Subject	Subject	Subject
Term 1	/	/	/	/	/	/	/	/	/	/
Term 2										
Term 3										

Term 1 - Reflection (Answer the questions by filling in the boxes in blue or black pen)

Are you happy with your rank scores and ATL?	What subjects do you need to improve?	How will you get there?

Reflection Sheet

Term 2 - Reflection

Has your rank scores and ATL improved from term 1? If no, why not?	What subjects do you need to improve in?	How will you get there?

Term 3- Reflection

Has your rank scores and ATL improved from term 2? If no, why not?	What subjects do you need to improve in?	How will you get there?

Signed _____
signature _____

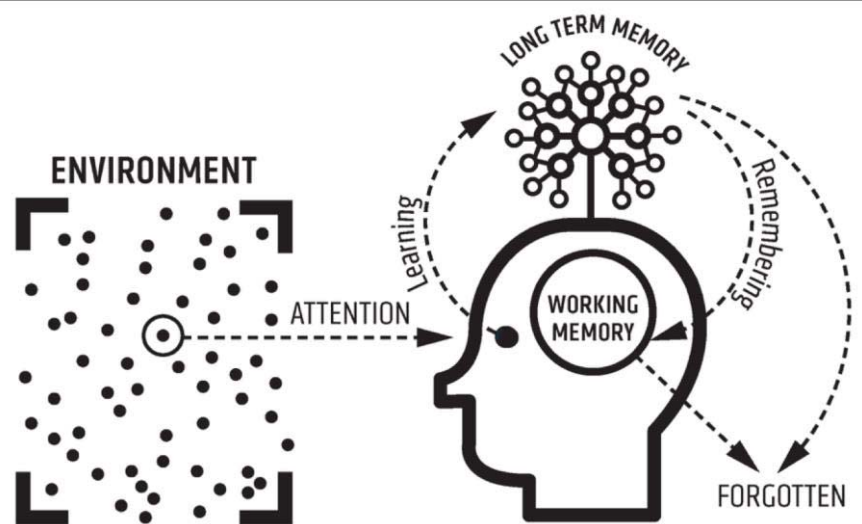
Tutor

Improving Your Long Term Memory

Memory

Your memory is split into two parts: the working-memory and the long-term memory. Everybody's working-memory is limited, and can therefore become easily overwhelmed. Your long-term memory, on the other hand, is effectively limitless.

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

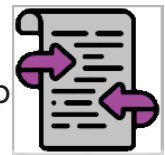


Need to know booklets are a key way to help you learn. Each booklet has the key information that needs to be memorised to help you master your subject and be successful in lessons.

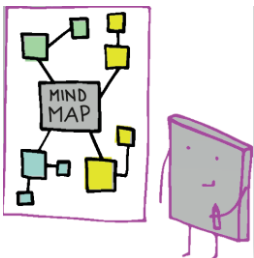
There is strong scientific evidence from cognitive psychology that shows the benefits of **self-quizzing** in promoting **retrieval strength**. This is your ability to quickly recall key facts related to your subject or topic

How should I self-quiz and how often?

There are lots of different ways to learn the material in your need to know booklet



You could:



Draw a mind map, jotting down everything that you can remember from the need to know booklet.



Cover up one section of the need to know booklet and try and write out as much as you can from memory.



Make flash cards based on the need to know booklet and ask someone to quiz you.

SENTENCES.
HAND
ARTICULATE.
PROJECT
Eye contact

Make up mnemonics to help you remember key facts, then write these out from memory.

Making revision notes and self-quizzing will help you be a more successful learner.

BOLD steps to your **BRIGHT** future



www.ASAPaspirations.co.uk

Post 16 pathways of Plymouth — Sixth forms — Apprenticeships — Employment — Resources

Support — Opportunities — Choosing a career — Parents guide — Writing a CV — Employability skills

The Formal Elements: The Formal Elements of Art are the parts used to make a piece of art work. It is impossible to create a piece of art, even if it is only a doodle, without using some or all of them. The art elements are Line, shape, form, tone, texture, pattern, colour and composition. They are often used together and how they are organised in a piece of art determines what the finished piece

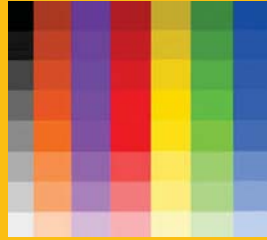
Line

A line is a path, left by a moving point. E.G. a pencil, or a paintbrush dipped in paint. A line can take on many forms. E.g. Horizontal, diagonal or curved. A line can be used



Tone

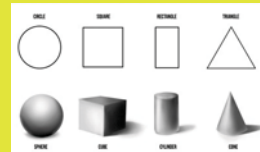
Tone means the lightness and darkness of something. This could be a shape and/or how dark or light a colour appears.



Shape & Form

A shape is an area enclosed by a line. It could be just an outline or it could be shaded in.

Form is a three dimensional shape such as a sphere, a cube or a cone.



Texture

Texture is the surface quality of something, the way something feels or looks like it feels. There are two types of texture, actual texture and visual texture.

Actual Texture: really exists so you can feel it or touch it.

Visual Texture: Created by using different marks to create the impression

Colour

There are three primary colours:

Red, Yellow, Blue

By mixing any two primary colours together, you get secondary colours.

Orange, Green and

Pattern

Pattern is a design that is create by repeating lines, shapes and tones or colours.

Patterns can be manmade such as a design on fabric or natural like the print on animal fur.



COLOR THEORY
Color is an element of art.

Everytime I use color, I am creating a color scheme.

This is a color wheel.

The most common color schemes are listed below.

Primary.... {I can make all the other colors by mixing different amounts of primary colors.}

Secondary.... {I can mix two primary colors to make a secondary color.}

Warm.... {Yellow and all the colors with red and orange tones are warm.}

Cool.... {Violet and all the colors with blue and green tones are cool.}

Complementary.... {Opposites on the color wheel are complementary.}

Analogous.... {Colors that are close neighbors on the color wheel are analogous.}

Rainbow.... {Using primary and secondary colors placed in order from the color wheel, I can make a rainbow.}

Intermediate.... is a color term I need to know. It is the color in between the primary and secondary colors on the color wheel.

Art & Design

Wayne Thiebaud

Thiebaud was an American painter known for his colourful works depicting commonplace objects—pies, lipsticks, paint cans, ice cream cones, pastries, and hot dogs. He was associated with the Pop Art movement because of his interest in objects of mass culture. Thiebaud used heavy pigment and exaggerated colours to depict his subjects, and the well-defined shadows characteristic of advertisements are almost always included in his work.



Claes Oldenburg

Claes Oldenburg (born January 28, 1929) is a Swedish-born American sculptor, best known for his public art installations typically featuring large replicas of everyday objects. Another theme in his work is soft sculpture versions of everyday objects.



Key Words

Composition	The position and layout of shapes on the paper
Line	Defines shape, the outer edges of something.
Tone	How dark or light a shape is.
Shape	The outline of objects.
Form	Appearing three-dimensional.
Pattern	A repeated shape or line.
Texture	The feel or appearance of a surface, how rough or smooth it is.
Proportion	The size and shape of one object in comparison to another.
Pigment	colour (something) with or as if with pigment.
Depicting	Represented something in a drawing, painting, or other art form.
Still Life	a painting or drawing of an arrangement of objects, typically including fruit and flowers and objects contrasting with these in texture, such as bowls and glassware.
Sculpture	The art of making two- or three-dimensional representative or abstract forms, especially by carving stone or wood or by casting metal or plaster.
Popular Culture	Popular culture is generally recognised by members of a society as a set of the practices, beliefs, and objects that are dominant or prevalent in a society at a given point in time.
Refine	To develop and improve your artwork.

Art and Design Assessment Objectives:

DEVELOP

Artist Research.
Explore Ideas.
Be Inspired.
Personal comments and opinions.

EXPERIMENT

Explore different materials
Explore different techniques
Refine your work

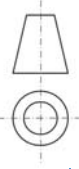
RECORD

Observational drawings
Collecting image
Taking photos
Annotating your work

PRESENT

Produce a final piece
Link to prep work from project.

Week	I will need to know:	So that I can:
1 Design Process	The first stage of the design process is where the client will give the designer a design brief . This is an explanation of the type of product that the designer must design, their task if you like. The designer will then need to analyse this brief and explore opportunities for design and problem solving. They will carry out market research so that they can become an expert on the target market's needs and wants but also other competitor products that are already available. Designers often carry out a product analysis or product disassembly to help them learn more about the products they will be competing against.	Design quality products that meet the requirements of a client and target market.
2 Design process continued	After market research, designers will create a design specification , this is a list of specific criteria for the success of the product . Usually consisting of a range of 'it must' or 'it should' statements. Next the designer will generate a wide range of design ideas , select the best ones to develop further and gradually and with the help of the client, narrow this down to one idea which they will take to the next stage. Designers will now often create prototypes of the design, testing elements and continuously improving the design. This will usually lead to the detailed design phase, often referred to as DFMA (Design For Manufacture and Assembly) . This leads to the manufacture of the product and the evaluation of the final product, often leading to continued design activity.	Design quality products that meet the requirements of a client and target market.
3 Past and present designers	Philippe Starck is a French industrial designer who has designed a huge variety of products ranging from luxury yachts to hotels and kitchen equipment. He spent much of his career working for the Italian brand Alessi who specialise in quirky kitchen and home products. Alessi's products very often have aesthetics (visual appeal) as the priority, their goal is to design products that meet the consumer's needs and requirements while at the same time making the consumer happier. Many of their products have a character or cartoon like appearance. This styling has had a big influence on the work of many other designers. Many Alessi products are collectors items and are known as iconic products (well recognised/famous/influential).	Design products with the influence of successful past and present designers.
4 Prototype	Prototypes are models of a design, these are created so that a concept can be tested. Prototypes can be virtual or physical . Virtual prototypes are creating on a computer using CAD. These can be tested in simulations, for example a virtual aeroplane wing can be tested against stresses virtually before spending thousands making a physical model. Physical prototypes are made often from card, foam or even clay. Prototypes are carefully tested to see if they function as intended, look appealing to the target market, fit with other components, are strong enough and more.	Develop my ideas and ensure they are as developed as possible before manufacture.
5 Ethical consideration in designing	It is important for a designer to consider the impact of their product on society, people from different cultures and the planet . Designing a hand gun toy for a child may be fun to play with but the effect of children playing with toy guns should be considered. Designing a bike that is aimed at people who wish to cycle to work will have a positive effect of people's health and the environment. Consider the possible effects of these: A sweet designed to look like a cigarette, a T-shirt with a swear word on, a computer game where the baddies are from a particular country, an electric vehicle, smiley face car sticker.	Consider the wider impact of our products.
6 Inclusive design	A successful design should also ensure a variety of end users can use the product safely and effectively. They might make adaptations with accessibility in mind, for example: a braille keyboard for those with sight difficulties, a long shoe horn to allow an elderly person to put a shoe on without having to bend down or fastenings such as Velcro for small children to use on a shoe. As people get older it is important that products are designed in a way that help people not lose their independence. Tasks such as changing batteries in a TV remote may seem simple but someone suffering from arthritis may find this extremely hard. Designer will therefore aim to design products that are ergonomic and user friendly for all. This is inclusive design .	Ensure our designs do not exclude anybody where possible.
7 Sustainable design The 6 Rs	Considered when designing any product and will help the designer create a more sustainable product . Remember this means an environmentally friendly product. Recycle (can materials be recycled?), Re-use (can parts be used again?), Reduce (can less material or energy be used?), Re-think (can the design be changed? Can we step back to the original problem and find a radically new way to solve it with less environmental impact?), Refuse (refuse to use harmful materials or processes), Repair (make spare parts available and make it easy to repair and maintain so its life will be longer and not need replacing so quickly.)	Be responsible and protect our planet through my design decisions.

Topic	I will need to know:	So that I can:
1 Engineering Drawings	An engineering drawing is a type of drawing that is used to communicate information about an object. It will show an object from multiple angles, and will give dimensions. It will also contain other information such as the materials the object is made from, who created the engineering drawing, the date the drawing was made and the tolerance.	Work from Engineering Drawings to produce accurate virtual prototypes.
2 Line types	Outline/drawing line—represents the visible edges or outlines of an object. Hidden detail line—indicates features that are not visible in the current view but are present on the object. Centre line—shows the centre or axis of symmetry of a cylindrical or symmetrical object. Dimension line—specifies the size of objects or features within the drawing. Construction line—temporary lines used for layout or alignment purposes, not included in the final design.	Understand the different line types used in Engineering Drawing.
3 Orthographic drawings	Third angle orthographic drawings are technical drawings used in engineering to represent objects in three dimensions. In this method, the object is imagined to be enclosed within a transparent box, with each face projected onto a separate plane. The front, top, and side views are drawn, showing the object from different perspectives. Third angle projection is used in engineering and manufacturing because it provides clear and accurate representations of objects for design and production purposes. In an engineering drawing, this symbol will be used in the Title Block to represent a third angle orthographic drawing. 	Present my design ideas in different angles.
4 Plastics	When designing and manufacturing new products, excessive use of plastics leads to vast amounts of non-biodegradable waste, which often ends up in landfills or oceans, emitting harmful greenhouse gases when incinerated. Additionally, the production of plastic materials requires fossil fuels, contributing to carbon emissions. Sustainable product design seeks alternatives to plastic, reducing waste and mitigating its environmental impact to combat the climate crisis. We use the 6 R's to help us consider sustainability when designing and manufacturing new products.	Consider the ethical implications of my design choices.
5 Technology Push and Market Pull	In engineering design, two approaches guide innovation: technology push and market pull. Technology push occurs when new technologies inspire product development, driving engineers to create solutions based on emerging advancements. Market pull responds to consumer demands and market needs, prompting engineers to develop products that fulfil specific requirements. By understanding both, engineers can balance innovation and practicality, ensuring their designs meet the needs of both emerging technologies and consumer preferences.	Understand what inspires innovation in the design of new products.
6 Anthropometric data and ergonomics	Anthropometric data and ergonomics are vital in engineering design. Anthropometric data involves measuring and analysing human body dimensions, like height and reach. Ergonomics focuses on designing products that fit human capabilities and limitations to enhance comfort and efficiency. Understanding these principles ensures that products are user-friendly and accessible to a wide range of people. By considering anthropometric data and ergonomics, engineers can create designs that optimise usability and minimise the risk of injury or discomfort for users.	Design products that are comfortable and easy to use.

Romeo and Juliet

Context – The play was written by William Shakespeare, and was first performed around 1594.

Shakespeare's Time – Shakespeare wrote his plays at the time of several monarchs: Queen Elizabeth I and James I. *Romeo and Juliet* was written relatively early in Shakespeare's career (the bulk of his tragedies were written in the 17th century) yet was extremely popular in his lifetime, as it is now. Shakespeare borrowed heavily from two texts: *The Tragedy of Romeo and Juliet* (1562) and *Plague of Pleasure* (1567).

Religion – The heavy religious presence is evident across several parts of *Romeo and Juliet*. This is reflective of a society across Europe that was deeply religious (predominantly catholic or protestant). Several characters demonstrate their commitment to the church, such as Romeo and Juliet who choose to marry rather than fornicate, and the Capulets, who are quick to contemplate that Juliet is in a better place (heaven) after she is found 'dead'.

Autocracy the supernatural – At the time of Shakespeare, the belief in both autocracy and the supernatural was far more prominent than in society today. The reference to 'star-cross'd lovers' demonstrates the large role of horoscopes and planetary positions in being used to predict fate. Also, Romeo and Juliet make reference to the fact that they feel they are being guided by a supernatural force (e.g. 'fortune's fool').

Elizabethan England and Italy – Shakespeare frequently engaged with Italy in his plays, leading many to believe that he travelled there between the late 1540s and early 1550s. Italy was a place that Shakespeare's contemporaries would have had a keen interest in: it was already an advanced and beautiful place for travel. Shakespeare's depictions of many areas of Italian life at the time are deemed largely accurate.

Patriarchal society – Society throughout the Middle Ages and at Shakespeare's time was patriarchal – women were considered inferior to men. This was also the case in much of Europe, including Italy. Women belonged to their fathers (or brothers if their fathers had died) and then their husbands, so Juliet would be expected to obey her father. Women were not permitted to own land or enter most professions. They were instead expected to bear children, be gentle and womanly.

Healthcare and medicine – Healthcare and medicine were not as advanced in Shakespeare's age as they are today – there were numerous ailments and diseases that were not yet understood. This makes it much more believable for both the Capulets and Romeo that Juliet could have died so suddenly and so young. The high death count in the play would seem slightly more common in those days!

Main Characters – Consider what Shakespeare intended through his characterisation of each of the below...

Romeo – The son and heir of Lord and Lady Montague. Romeo is handsome and intelligent, yet he is also impulsive and extremely sensitive. Romeo is a peaceful character, and is not interested in the violence that goes on around him, choosing instead to focus his energies on love. Although Romeo's love seems fickle (he loves Rosaline at the outset) his commitment can't be debated in the end!

First scene: Act I Scene II **Final scene: Act V Scene III**
Prince Escalus – The most powerful character in the play, with the authority to govern the other characters and administer sentences. He is also a kinsman to Mercutio and Paris. As the seat of Verona, his main concern throughout most of his appearances are in relation to ensuring that the peace is kept. He is marvellous in banishing Romeo for the death of Tybalt, as opposed to sentencing him to death.

First scene: Act I Scene I **Final scene: Act V Scene III**
Montague and Capulet – The patriarchs of the Montague and Capulet families, who have held a long and violent feud with one another from some time before the play begins. Both seem to deeply love their respective child, yet do not always seem appropriately aware of their emotional wellbeing. For example, Romeo chooses to walk the streets in melancholy rather than share his feelings with his father, and Capulet feels the best thing for Juliet would be a marriage with Paris.

Juliet – The daughter of Capulet and Lady Capulet, Juliet is a beautiful young girl (13 years old at the start of the play). Juliet is caring, compassionate, and at times demonstrates courage (she defies her parents in order to marry Romeo, and drinks the contents of the vial without fully trusting its effects). At times, she shows great intelligence and wit, particularly in conversations with her mother.

First scene: Act I Scene III **Final scene: Act V Scene III**
Mercutio – A kinsman to the prince and one of Romeo's closest friends. Mercutio is an extraordinary character in that he has a sparkling wit and a vivid imagination. Much of Mercutio's speeches deal in puns and word-play. He appears to see himself as being above the vices of love, choosing instead to view it as misplaced sexual appetite. His hot-headedness is eventually his downfall.

First scene: Act I Scene IV **Final scene: Act III Scene I**
Friar Laurence and the Nurse – Both Friar Laurence and the Nurse act as guidance counsel for Romeo and Juliet. They appear to be the two people that Romeo and Juliet trust more than any others in the world, as they are the two that they confide in. Friar Laurence is kind and fair-minded (believing the marriage may heal the feud), whilst the Nurse is kind and sentimental (yet at times vulgar). She seems as though she is more of a mother to Juliet than Lady Capulet has ever been.

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

Love – In *Romeo and Juliet*, love is an extremely overpowering force that supersedes all other values, emotions, and loyalties. Through their love, Romeo and Juliet conspire to go against the forces of their entire social world. Romeo returns to visit Juliet at points, even though he is well aware of the threat of death. At times, love is presented as fickle (Mercutio's speeches, Romeo's Rosaline).

Individual vs Society – Romeo and Juliet are forced to undermine the oppressive rules of society at the time. For example, rules of the patriarchal family force Juliet to be subservient to her parents, rules of religion mean that they must marry in haste, and rules of masculinity force Romeo into conflict with Tybalt.

Violence – Extreme violence takes place sporadically throughout the play. The feud between the two families is so bitter that the mere sight of each other can be the cause of a fight to the death. Unchecked violence is personified through the character of Tybalt. The violence culminates in Act 3 Scene 1, in which both Mercutio and Tybalt are murdered.

Fate – In the first address to the audience, the Chorus states that Romeo and Juliet are 'star-cross'd' lovers, meaning that fate had intended for their paths to cross, and that fate controls their actions. A series of unfortunate accidents towards the end of the play thwart Friar Laurence's plan and eventually manifest in both Romeo and Juliet committing suicide, thus adding to the sense of fate.

Scene-by-Scene Summary – Table note of the key quotations from each scene.

	Prologue		
	The Chorus speaks of an ancient grudge between two households, from which two 'star-crossed lovers' appear. A pair of star-crossed lovers take their life... To old Fire-town, our common judgment place. Once more, on pain of death, all men depart.		From forth the fatal loins of these two foes A pair of star-crossed lovers take their life... To old Fire-town, our common judgment place. Once more, on pain of death, all men depart.
Act 1 Scene 1	Paris speaks of his desire to marry Juliet to Capulet. They arrange a masquerade ball so that he can begin to woo her. Peter accidentally invites Romeo and Benvolio.		One fairer than my love? The all-seeing sun Ne'er saw her match since first the world began.
Act 1 Scene 2	Lord Capulet discusses the prospect of Juliet getting married to Paris. She dutifully says that she will look upon him.		It look to like? Looking living move! But no more deep will I endite mine eye than your content gives strength to make it fly.
Act 1 Scene 3	Before the ball, Mercutio mocks Romeo. He gives his 'Queen Mab' speech. Romeo fears the night will set him in motion.		O, then I see Queen Mab has been with you... She is the fairer maid... If I profane with my unworthiest hand This holy shrine, the gentle air is this: My lips, two blushing pilgrims, stand To smooth that rough touch with a tender kiss. But passion lends them power, time means, to meet.
Act 1 Scene 4	Romeo and Juliet meet at the ball. They immediately fall for each other. Romeo uses metaphor to compare her to a pilgrim. Tybalt spots Romeo and wants to kill him, but Capulet stops him.		Go then, for 'tis in vain To seek him here that means not to be found. If that thy bent of love be honorable, Thy purpose marriage, send me word tomorrow, By one that I'll procure to come to thee, Thy love did read by rote that could not spell. But come, young waverer, come go with me, The sovereignty will fall upon Macbeth.
Act 1 Scene 5	Romeo and Juliet learn that they are from warring families. The chorus returns and delivers a sonnet about the new love.		But her dear love's Some means to come to shrift this afternoon. And there she'll shroud her love's cell. Be shrined and married! But come what sorrow can, it cannot counteract the exchange of joy. That one short minute gives me in her sight. "A plague o' both your houses!" "As for me tomorrow, and I you shall find me a grave man!" O nature, what hast thou to do in hell? When thou dost bow the gentle of a star in many passions, when sweet faint There is no world without Verona walls But purgatory, torture, hell itself! Hence, banished! Be banished from the world! Hence, banished! Be banished from the world! I tell thee what: get thee to church o' Thursday, Take thou this vial, being then in bed, And this distilled liquor drink thou off. Romeo, Romeo! Here's I drink to thee.
Act 2 Prologue	Benvolio and Mercutio search for Romeo, who has escaped them in the hope of re-finding Juliet.		Romeo, Romeo! Here's I drink to thee. O me, O me! My child, my only life, Rejoice, look up, or I will die with thee! Well, Juliet! I will lie with thee tonight. Let's see for means. O mischief, thou art swift. Unhappy fortune! By my brotherhood, The letter was not free but full of charge, For never was a story of more woe Than this of Juliet and her Romeo.
Act 2 Scene 1	The famous 'balcony scene'. Romeo decides that he cannot go home without seeing Juliet again. He trespasses into her garden, where she appears at a window. They decide that they will wed.		
Act 2 Scene 2	Romeo visits Friar Laurence to ask if he will wed him to Juliet. Whilst shocked at how fickle Romeo's love is, he agrees.		
Act 2 Scene 3	Romeo arrives, and Mercutio makes fun of the Nurse. When Mercutio leaves, Romeo arranges with the Nurse for Juliet to meet him at Friar Laurence's chamber.		
Act 2 Scene 4	The Nurse sends Juliet to Friar Laurence's cell, where they are married. The Nurse warns them to be moderately, Tybalt duels Mercutio. Romeo tries to make peace, but Tybalt slays Mercutio dead under Romeo's arm. In rage, Romeo kills Tybalt. The Prince arrives and calls Romeo a villain.		
Act 2 Scene 5	The Nurse tells Juliet of the fight. Juliet is traumatised by the idea of an exiled Romeo. The Nurse says she knows where he is hiding. Romeo despairs at hearing of being banished. The Nurse makes a plan for him to visit Juliet before leaving. Elsewhere, Capulet contacts Paris and arranges for Juliet to marry him.		
Act 3 Scene 1	Romeo reluctantly leaves Juliet. Her mother then tells of the marriage to Paris. She rejects it. Capulet threatens to disown her. Juliet meets Friar Laurence, saying that she would rather kill herself than marry Paris. Friar Laurence proposes the sleeping potion plan. She agrees, return to her parents, and repents.		
Act 3 Scene 2	Juliet is scared, but drinks the contents of the vial.		
Act 3 Scene 3	The Nurse finds Juliet dead on her wedding morning. The family are distraught, but agree to make the funeral arrangements. Romeo is told of the death by Balthazar. Romeo decides that he will return to Verona to kill himself. Before doing so, he purchases poison from an apothecary.		
Act 3 Scene 4	Friar Laurence learns that Romeo has not received his letter informing him of the plan, and is worried. He doesn't know that Romeo now thinks that Juliet is dead.		
Act 3 Scene 5	Romeo finds Juliet's body and kills himself. She awakens and kills herself. Montague and Capulet commit to revenge.		

Dramatic Devices in Romeo and Juliet

Dramatic Irony	Mercutio and Benvolio think Romeo is still pining over Rosaline, but the audience knows he has moved on to Juliet. A2 S1	Features of a Tragedy in Romeo and Juliet Tragic Hero – A main character cursed by fate and possessed of a tragic flaw (Romeo, and to an extent Juliet).
soliloquy	Juliet's opening speech in A3 S2 in which she pours her heart out over her love for Romeo.	Hamartia – The fatal character flaw of the tragic hero (his passion and impulsiveness).
Aside	Juliet secretly hopes for the 'villain' Romeo: Villain and he be many miles asunder. God pardon him! A3 S5.	Catharsis – The release of the audience's emotions through empathy with the characters.
Foreshadowing	Friar Laurence: These violent delights have violent ends. And in their triumph die, like fire and powder. A2 S6	Internal Conflict – The struggle the hero engages in with his/her fatal flaw.

Health, Safety and Hygiene

Health, safety and hygiene.

- ◆ Always listen to the teacher and follow instructions.
- ◆ Do not run in the food room.
- ◆ Do not leave bags and blazers where they can get in the way and cause a tripping hazard.
- ◆ Walk sensibly around the room when carrying equipment especially knives.
- ◆ Always return equipment once its finished with and cleaned especially knives. These will be counted in at the end of every lesson.
- ◆ Always listen carefully when the teacher is demonstrating how to use equipment. Make sure you ask questions if you do not understand.
- ◆ Take your blazers off and roll up your sleeves when doing a practical lesson.
- ◆ Tie your hair back.
- ◆ Always wash your hands thoroughly when preparing foods.
- ◆ Always use hot soapy water to wash your equipment.
- ◆ Make sure all spillages are cleaned up immediately.
- ◆ **Always** use an oven cloth when taking food from the oven.

The Eatwell Guide

Fruits and vegetables.

Eat at least 5 portions of a variety of fruits and vegetables a day.



Drinks.

6-8 glasses a day. Water, lower fat milk, sugar free drinks including tea and coffee count.

Potatoes, bread, rice, pasta and other starchy carbohydrates.

Choose wholegrain or higher fibre versions with less added salt, sugar and fat.

Beans, pulses, fish, eggs meat and alternatives (protein).

Eat more beans and pulses, 2 portions of sustainably sourced fish per week, one of which is oily. Eat less red and

Dairy and alternatives.

Choose lower fat and lower sugar options.

Oils and spreads (fats).

Choose unsaturated oils and use in small amounts.

Foods high in fats and sugars.

Eat less often and in small amounts.



Preparation Skills and Techniques

Chopping, Slicing, Dicing and Peeling Skills



Bridge Hold

Claw Hold

Peeling

What could happen?

Cake and Pastry Making Methods

Rubbing -in Method

Used for pastry and cakes that **do not have a large amount of fat** compared to flour

- ◇ Fat is **cut into chunks** (block margarine is best)
- ◇ Air is trapped when sieving the flour and by lightly **rubbing the fat in to the flour**
- ◇ Any optional ingredients (e.g. sultanas) are **added before the liquid or egg** that binds the crumb together



Creaming Method

Used for cakes containing **more fat and sugar** compared to flour

- ◇ The fat and sugar are **creamed together** using a **wooden or plastic spoon**. Air is **trapped** by **creaming** the sugar and fat together
- ◇ Soft margarine is better as it is **easier to cream**
- ◇ **Caster sugar** has **smaller crystals** than **granulated** so it **traps more air** and mixes better
- ◇ **Self raising flour** is used to make the cakes rise



Melting Method

- Fat is melted with the sugars and syrup
- Dry ingredients added
- Liquids bind all ingredients together



Year 9 French - Cycle 3

	French	English
Week 1	La difficulté de la recherche est claire.	The difficulty of the research is clear.
Week 2	Le coût à payer est de 100 euros, n'oublie pas de le payer !	The cost to pay is 100 euros, don't forget to pay it!
Week 3	J'essaie de décider si je dois voler à Paris.	I'm trying to decide if I should fly to Paris.
Week 4	Il est interdit de faire la bise pendant la pandémie.	It's not allowed to kiss on the cheek during the pandemic.
Week 5	L'armée réussit dans le nord.	The army is succeeding in the North.
Week 6	Je me réveille puis je me lave.	I wake up then I wash myself.
Week 7	Elle se demande quand elle va se lever.	She wonders when she will get up.
Week 9	Pendant que vous dînez dans la salle à manger, nous parlons dans le salon.	While you have dinner in the dining room, we talk in the lounge.
Week 10	L'écrivain me surprend quand il raconte une histoire.	The writer surprises me when he tells a story.

Each week you will need to practise and learn your **Sentence of the Week** as well as your **Vocabulary of the Week**. For your **Vocabulary of the Week** also pay attention to which type of words they are:

Verbs are in VIOLET
Feminine nouns are in PINK
Masculine nouns are in BLUE
Adjectives are in AMBER

Week 1		Week 2		Week 3		Week 4		Week 5	
encourager	to encourage, encouraging	livrer	to deliver, delivering	annuler	to cancel, cancelling	la bise	kiss on the cheek	établir	to establish, establishing
obliger	to force, forcing	oublier	to forget, forgetting	arriver à	to manage to, managing to	faire la bise	to kiss on the cheek, kissing on the cheek	fournir	to provide, providing
me/m'	me (obj)	payer	to pay, paying	continuer	to continue, continuing	l'isolement (m)	isolation	grandir	to enlarge, enlarging
te/t'	you (obj)	le ² /l' ²	it (m), the (m)	continuer de	to continue to, continuing to	le masque	face mask	réussir	to succeed, succeeding
la difficulté	difficulty	la ² /l' ²	it (f), the (f)	décider	to decide, deciding	la pandémie	pandemic	sentir	to feel, feeling
l'objectif (m)	objective	le coût	cost	décider de	to decide, deciding	le vol	theft, flight	l'armée	army
la recherche	research	le client	customer	essayer	to try, trying	impossible	impossible	le début	beginning
le résultat	result	la marque	brand	essayer de	to try to, trying to	interdit	not allowed	l'état (m)	state
clair	clear	la mode	fashion	voler	to steal, to fly	mondial	global	l'ouest	west
presque	almost	cent	hundred			nécessaire	necessary	le sud	south
supplémentaire	extra	mille	thousand					l'est	east
		quatre-vingt	eighty					le nord	north
		quatre-vingt-dix	ninety					le soldat	soldier
		soixante-dix	seventy					la fin	end
Week 6		Week 7		Week 8		Week 9		Week 10	
laver	to wash, washing	se sentir	to feel, feeling	dîner	to have dinner, having dinner	couler	to flow, flowing	raconter	to tell (a story), telling (a story)
se laver	to wash oneself, washing oneself	se lever	to get up, to stand up	voir	to see, seeing	surprendre	to surprise, surprising	la banlieue	suburbs
appeler	to call	s'organiser	to get organised, to organise oneself	le vois	I see, I am seeing	le cou	neck	l'écrivain (m.)	writer
s'appeler	to be called, being called	se trouver	to be located, to find oneself	tu vois	you see, you are seeing	l'immeuble (m.)	apartment block	la tour	tower
présenter	to present	se demander	to ask oneself, to wonder	il voit	he sees, he is seeing	doux	soft (m.)	douce	soft (f.)
se présenter	introduce oneself	se loger	to stay, staying	elle voit	she sees, she is seeing	le salon	dining room	la cave	cellar
réveiller	to wake, wake	l'Afghanistan	Afghanistan	la pièce	room	la salle à manger	dining room	la cave	cellar
se réveiller	to wake (oneself) up, waking (oneself) up	conflit	conflict (m)	le téléphone	telephone	la cave	cellar	quand	when
l'accord	agreement	crise	crisis (f)	l'escalier	stairs	pendant que	while		
la journée	day (duration)	association	association (f)	le salon	lounge				
le member	member	afghan	Afghan (m)	la salle à manger	dining room				
la paix	peace	afghane	Afghan (f)	la cave	cellar				
efficace	effective	grave	serious						
fier	proud	actuel	current						
officiel	official (adjective)								

Revision of cycle 1
and cycle 2
vocabulary

Geography

Week 1	Week 2
Urban Growth and Megacities Urbanisation is the increase in the proportion of people living in towns and cities. Over half of the world (55%) live in urban settings. The UN estimates this milestone event – when the number of people in urban areas overtook the number in rural settings – occurred in 2007. A global city is well connected to other places by the process of globalisation. For example, London is connected to other places by transport as Heathrow airport. Today they are mostly found in HICs and NICs but in the future more global cities will be found in Africa. A megacity is a place with a population of over 10 million people eg. Tokyo.	Causes of urban growth The pattern of urban growth is not the same around the world. Cities in Europe and North America reached the peak of their growth in the 1950s or earlier. Urbanisation is currently much more rapid in NICs and LICs. Cities in Asia and Africa have now overtaken HICs in terms of population size. PUSH factors are reasons for leaving the countryside/villages e.g. lack of jobs. PULL factors are reasons for moving to the towns and cities e.g. more services. Mumbai is experiencing rapid rural-urban migration which is the movement of people from the countryside to the cities.
Week 3	Week 4
Consequences of rapid urban growth Mumbai in India has experienced rapid urban growth which has resulted in the creation of informal settlements. The standard of living in these informal settlements can be a lot lower than other parts of the city where people lack access to basic sanitation, often sharing 1 toilet per 500 people. Families live in units known as chawls, which are apartments and families share 1 room. The number of children living on the streets is also high and they pay rent to the criminals who 'own' them. The transport system in Mumbai is overwhelmed and overcrowded with the city's 22 million residents.	Dharavi (informal settlement in Mumbai) More than 650,000 people are spread over 2.5 sq km. Homes and factories coexist in single buildings lining the narrow lanes. Challenges: Eight to 10 people live together in 100 sq ft. Most people are informal daily-wage workers. dwellings. About 80% of the residents use community toilets. Opportunities: 120,000 rag-pickers collect waste and help to recycle - 80% of waste is recycled compared to 20% in the UK. There is a strong sense of family. The businesses in Dharavi generate between \$885 million to \$1 billion annually.
Week 5	Week 6
Re-generating Dharavi Top-down development: wholesale clearance: The old buildings would be demolished and the new homes (high rise flats) will improve the quality of life and remove polluting industries from the area. There will also be schools and parks, and will cost around \$2.3 billion to create. Bottom-up development: self-help schemes: They use appropriate technology suited to local conditions, e.g. using motorised rickshaws to deliver concrete as lorries would not fit in the narrow streets. The concrete can then be used to improve people's homes.	Why has Sydney grown? Sydney is a global city in Australia, a high income country (HIC). It is connected to other parts of the world by international migration, finance and trade. Sydney has grown due to international migration. Up until the 1970s, people came from Europe but since the 1970s more people have arrived from Vietnam and other Pacific countries. Within Sydney some parts are richer than others, e.g. Manly is wealthier while Cabramatta is poorer. International migrants from Vietnam have moved to the poorer parts of Sydney.

Week 7	Week 8
What challenges does Sydney face? Poverty and deprivation- The wealthiest areas are in the east of Sydney – 20% of all income goes to 1% of the population. Waste disposal -Landfill sites close to the city are running out of space as the population has grown. Transport and infrastructure - Sydney is a large, sprawling city. About 80% of all journeys in Sydney are made by car. People living in the suburbs to the west and southwest have few public transport options, so most are forced to drive. Housing provision and quality- Sydney is in the top ten least affordable cities in the world	Sustainable Sydney In 2018 the Government began a four-year scheme to improve the transport infrastructure. AU\$55.6 billion will be invested by 2022. The money will be spent on improving motorways and roads, as well as a new tram system, Sydney Light Rail. It will connect the city center to the southeast suburbs and will be able to carry 13,500 passengers an hour. Sydney's 10 targets for 2030 include: The city will reduce greenhouse gas emissions by 50% compared to 1990 levels, 100% of electricity demand and 10% of water demand will be met by local production, 48,000 additional dwellings and 7.5 per cent of all city housing will be social housing, and 7.5 per cent will be affordable housing.
Week 9	Week 10
Do all global cities face the same challenges? Mumbai (NIC): Squatter settlement (Dharavi) is built next to a river so there is a risk of flooding. There is a lack of sanitation from the informal buildings and no piped water. 62% of people in Mumbai don't have access to clean water/basic services. This is as a result of rural-urban migration happening at such a fast pace. vs London (HIC): However only 1% of people in London are homeless – due to more well paid formal jobs in London fewer people have challenges with housing. Although housing prices are high there is more housing available (London is not growing as quickly).	Sinking Jakarta Jakarta is located in Indonesia, on the island of Java. It is located in Asia. It is a megacity. Jakarta is home to about 10 million people and has three times that number in the greater metropolitan area. It has been described as the world's most rapidly sinking city, and at the current rate, it is estimated that one-third of the city could be submerged by 2050. The main cause is uncontrolled groundwater extraction, but it has been exacerbated by the rising Java Sea due to climate change.
Week 11	Week 12
Sustainable Cities Features of a sustainable city include: Solar or wind energy creates electricity, lots of well-paid jobs, lots of green, open space, electric public transport, people and businesses recycle their waste and good quality, affordable homes are built. Sustainable means the meeting of today's needs without compromising future generations to meet their own needs. Masdar City is a planned city project in Abu Dhabi, in the United Arab Emirates. Masdar City is one of the world's most sustainable urban communities, a low-carbon development made up of a rapidly growing clean-tech cluster, business free zone and residential neighbourhood with restaurants, shops and public green spaces.	

Why was the world on the brink of destruction in the second half of the 20th Century?

Why did the USA and USSR become enemies?

- After the Second World War ended, the USA and Britain wanted to make the world free, democratic, able to trade, and capitalist.
- However the USSR (Russia) wanted to make the world equal and communist. They didn't care about democracy or freedom.
- In 1949, the USSR tested its first nuclear weapon and, as a result, the USA started to see the USSR as an enemy and the Cold War began.

Why was it called the "Cold War"?

- The USA and USSR began an arms race with each other: each of the countries trying to build more nuclear weapons than the other to prove they were best.
- Eventually they developed rocket technology and ICBMs so the USSR and USA could attack each other from the other side of the world with the push of a button.
- If one side fired their missiles, then the other side would detect them and fire theirs—both sides would be destroyed from the system known as M.A.D.
- Because of MAD, the two superpowers never went to war directly and it became a "Cold War". Instead they had to compete through other countries, sporting events, space technology, and through cultural achievements.

How did the Cuban Missile Crisis affect the Cold War?

- In 1962, the world came close to nuclear war during the Cuban Missile Crisis.
- The USSR had placed missiles in Cuba which was very close to the USA.
- The USA blockaded Cuba and the USSR threatened to launch their missiles.
- In the end the USSR backed down and the two superpowers set up a phone hotline because they realised they had to communicate to avoid a nuclear war.
- A nuclear war could end human civilisation because the nuclear explosions would kill millions of people and the fallout would stop plants growing for years.

What problems did the USA have at home during the Cold War?

- The USA fought a long war in Vietnam to try and stop it becoming communist but with the USSR and China's help, the Vietnamese won.
- The American people became tired of the war and began to protest against it.
- The Vietnam War was seen as wrong because most of the Americans that fought in the war were young, poor, and black. Also the US military injured and killed many civilians while trying to fight the enemy soldiers.
- Although the USA were the first nation to put a man on the moon, the President that promised the moon landing was assassinated in Texas in 1963.
- The Cold War highlighted many social problems such as sexism and racism, and the younger generation protested for change.

HISTORIAN SKILLS

Knowledge
Explanation
Using Sources
Interpretation

KEYWORDS

Capitalism = money controls everything
Communism = society free of money
Fallout = radioactive dust and ash in the sky that blocks sunlight
ICBM = Intercontinental ballistic missile
MAD = Mutually assured destruction
Nuclear weapons = warheads that use the power of splitting or joining atoms
Superpowers = countries that are so powerful they can control world events
USSR = Union of Soviet Socialist Republics

IMPORTANT DATES

1945 = Second World War ends
1949 = USSR tests a nuclear bomb
1949 = The communist revolution in China
1957 = USSR develops long range missile technology for ICBMs
1957 = USSR launches its Sputnik satellite
1960 = Birth control pill available
1962 = Cuban Missile Crisis
1963 = American President JFK assassinated
1964 = Civil Rights Act passed in the USA
1969 = Moon landing
1975 = Vietnam War ends
1976 = Race Relations Act passed in Britain

FAMOUS SOURCE

Nature = a cartoon

Origin = published in a British newspaper 29th October 1962

Purpose = to show how close the world had got to nuclear war
The Source shows the leaders of the USSR and USA (Khrushchev on the left and Kennedy on the right). Both men are sitting on nuclear missiles and are arm wrestling. President Kennedy appears more composed and the USSR leader Khrushchev is sweating. Both men have their fingers over the detonation button.



What questions do historians ask and how do they answer them?

1. Why did the Second World War begin?

- The British people and the government didn't want another war, the First World War had cost 1 million lives and injured 1 million more men.
- However, Germany had been so badly ruined that they had voted for a new, angry, powerful leader called Adolf Hitler and he wanted more land.
- The British Prime Minister gave into Hitler's requests for land and gave him parts of the modern day Czech Republic. This policy was called "appeasement" but it didn't work, Hitler wanted more land in Poland.

2. Why did the British people suffer so much during the Second World War?

- Britain declared war in 1939 against Germany and their ally Japan. The Second World War had begun.
- The new and most scary weapons were aeroplanes and the bombs they could drop.
- Soon British cities were being bombed from the air and civilians were being killed.
- The British Navy and Royal Air Force were very important during the Second World War. They had to protect Britain's skies from bombers and try to keep supplies coming in by sea.
- Britain was alone against Germany after France was defeated in 1940 but the people held on. The British public had to eat less, sleep in bomb shelters, help their communities and even separate their families during the war.

3. Write down three questions that you can answer using the paragraph below.

- Eventually, with the help of Russia (USSR) and the USA, Britain was able to fight back the enemy in Africa, Burma and mainland Europe.
- As the British Army pushed back the Germans, they found terrible camps where innocent civilians had been locked up and forced to work, some were even designed as death camps.
- Both Japan and Germany did not respect human rights for everyone.
- By April 1945, the German Army was in full retreat and the Russians reached Berlin—Adolf Hitler killed himself in his underground bunker.
- Japan surrendered after the USA dropped two atomic bombs on two cities.
- Both Germany and Japan surrendered in 1945.

4. How do historians find out the "truth" about what happened in the war?

- Historians have worked out what happened during the Second World War from researching contemporary sources (evidence from the time) and writing interpretations.
- Later historians (like us) can then compare these interpretations, look at the original sources, and try to work out what actually happened.
- This cross-referencing of evidence is vital to finding the "truth" of what happened.

HISTORIAN SKILLS

Knowledge
Explanation
Using Sources
Interpretation

KEYWORDS

Interpretations = a version of events based on research
Cross-reference = comparing different evidence on the same event
Contemporary = from the time of the event
Source = a piece of evidence
Research = finding information on an event
Biased = one-sided

IMPORTANT DATES

1938 = Munich conference to appease Hitler
1939 = Second World War begins
1940 = Germany defeats France using blitzkrieg tactics
1940 = Battle of Britain.
Children evacuated to the countryside
1941 = Germany invades Russia (USSR)
1941 = Japan attacks the USA at Pearl Harbour
1942 = Battle of Midway
1943 = Battle of Kursk
1944 = D-Day
1945 = Germany surrenders.
VE Day 8th May 1945
1945 = Atomic bombs dropped on Hiroshima and Nagasaki, Japan surrenders.
VJ Day 15th August 1945

FAMOUS SOURCE

Nature = a poster

Origin = designed in 1939 by the government

Purpose = to make people feel better after air raids

The Source shows us what the government wanted people to think during the war, but it does not tell us how the public actually felt. The poster is an example of propaganda. Although 2.5 million were made, only around 20 were ever put up during the war! One was found in the year 2000 and it became very popular again.

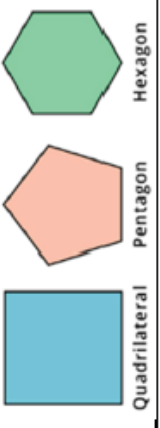
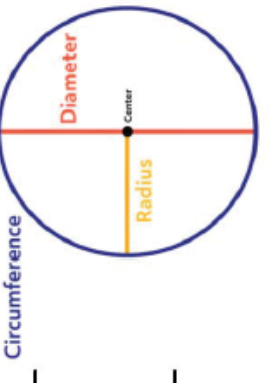


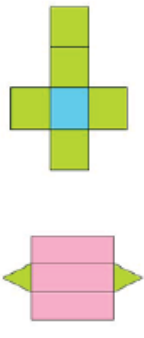
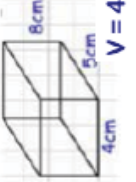
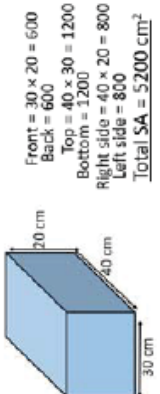
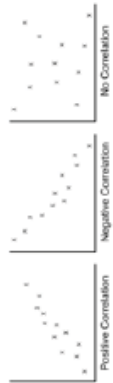
KEEP
CALM
AND
CARRY
ON

Creating Interactive Digital Media

Interactive digital media products are found across the media industry in games, websites and apps, learning platforms, simulations and in commerce. The content of these products have been designed to create an immersive and engaging environment which can promote, educate, entertain, inform or influence. Digital design skills will enable students to design and create interactive digital media products that meet a given client brief and appeal to an identified target audience whilst developing industry standard IT skills.

Topic of Learning	I will need to know:	So that I can:
Types of interactive digital media, content and hardware	There are many different types of interactive digital media products, websites, information points, mobile apps, e-learning products, digital maps and games. The format of the media product is determined by the purpose of the product and the target audience. The content of media products include images, audio, video, animation text, tables, lists, forms, navigational buttons, maps and layers. Different hardware is used to access media products. Examples include computers, games consoles, kiosks, mobile phones, smart TV and tablets.	Identify the purposes of different interactive media products and their target audience.
Features and conventions of interactive digital media	The features of media design includes a graphical user interface (GUI) consistent layout, colour scheme, house style, typography selection and white space. Interface and interaction styles include click, touch, voice control, motion, drag, drop and feedback. Conventions of digital media include non-linear navigation, user friendly intuitive interfaces and accessibility for target audiences.	Understand what makes an effective GUI in order to create different types of interface when creating digital media products.
Resources required to create interactive digital media	The hardware used to create digital media, includes computer, mouse, stylus, monitor, graphics tablet, touch screen, microphone and digital camera. Software used to create digital media, includes web authoring software, app creation, video editing, image editing and animation software.	Identify the most appropriate hardware/software to use when creating digital media products.
Planning documentation and techniques	Before creating a digital product, the product needs to be planned. Pre-production documents created are wire frames, storyboards, navigation diagrams, mind maps, mood boards, master page templates and interactivity designs.	Understand the importance of planning a digital media product before it is created.
Technical skills needed to create digital media products	There are many technical skills required to create digital media products. Skills include, advanced searching, selecting appropriate image types eg bitmap or vector, adjusting image size, canvas size, applying filters, retouching and layering. When repurposing video, tools used include cut, split, trim, extend, optimise file size, volume editing, enhancing sounds. When creating animations, tools used will include frames, onion skinning and motion tween.	Use a range of technical skills to create effective digital media products.

Word	Used in context	Definition	Example
Parallel	A square is made up of two sets of parallel lines	Lines that do not meet or cross and are always the same distance apart	
Perpendicular	Two sides of a square meet at a right angle. Therefore, they are perpendicular	Two lines intersecting to form a right angle	
Transversal	Which of the lines below is the transversal ?	A line that crosses at least two other lines	
Polygon	Square, rectangle, triangle and pentagon are all examples of polygons	A closed shape with straight sides	
Regular Polygon	A pentagon with all sides the same length is a regular polygon	A polygon with all angles equal and all sides the same length	
Circumference	Calculate the circumference of this circle	The perimeter of a circle	
Diameter	Use the diameter to work out the circumference of the circle.	A straight line passing from side to side of a circle, through the centre	
Radius	Use the radius to calculate the area of the circle	A straight line from the centre to the circumference of a circle. Half of the diameter	
Compound Shape	Calculate the area of the compound shape shown in the diagram	A shape made up of two or more geometric shapes	

Word	Used in context	Definition	Example
Net	Show the net of a cube with edges 3cm long	Describes what a 3D shape looks like when opened and laid flat	
Prism	How many faces does this prism have?	A solid object with a constant cross section	
Volume	Calculate the volume of the cuboid	The amount of 3D space an object takes up Volume = length x width x height	
Surface Area	Work out the surface area of this prism	The amount of space covering the outside of a 3D shape	
Scatter graph	The scatter graph shows the heights and weights of ten children	A graph displaying values for two variables for a set of data	
Bivariate data	What type of graph shows bivariate data?	Data that has two (usually related) variables	Weight and height
Correlation	What type of correlation is shown by this scatter graph?	The relationship between two variables	
Probability	What is the probability of flipping a coin and it landing on heads	The likelihood of an event happening	$P(\text{Heads}) = 0.5$
Relative Frequency	Calculate the relative frequency of getting a 6 after the dice was rolled thirty times	The number of times an event happens divided by the number of trials in an experiment	Emma has won ten tennis matches and lost seven. The relative frequency of Emma winning a match is $\frac{10}{17}$

Training Zones

Make sure that you can recall the guidelines for each zone. Can you link to sporting activities that would require training in each zone.

	Aerobic Training Zone	Anaerobic Training Zone
% of Maximum Heart Rate	60-80% of MHR	80-90% of MHR
Intensity of Exercise	Low to moderate intensity	High intensity
Length of Time in Zone	At least 15-20 minutes to have a training effect	15 seconds to 1 minute intervals
Related Training Methods	Continuous, Fartlek, Interval, Circuit	Weight, Interval, Circuit
Fitness Components that can be worked	Cardiovascular and muscular endurance	Speed, Power, Strength Tolerance to lactic acid

Calculating Intensity of Exercise through Heart Rate Zones– Example

A 20 year old joins a local gym and has been set a training programme where they will need to monitor their heart rate, to make sure that they are working hard enough but not overtraining.

Step 1– Calculate maximum heart rate. $220 - 20 = 200$ bpm

Step 2– Aerobic Training Zone (lower threshold) $220 \times 0.6 = 120$ bpm

Step 3– Anaerobic Threshold (upper end of Aerobic Zone/lower end of Anaerobic Zone) $220 \times 0.8 = 160$ bpm

Step 4– Upper End of Anaerobic Zone $220 \times 0.9 = 180$ bpm

Can you calculate training zones for yourself and a member of your family?

Training Methods– Memory Tip– WIFCC

Can you describe training methods and the component of fitness they target. What type of training would different athletes use? Why would it improve their performance? Can you attempt the example sessions.

Training	Description	Example Session
Weight Training	Lifting a resistance to cause adaptation to the muscles. Involves repetitions (the amount of times the movement is performed) and sets (a group of repetitions).	3 sets of 10 repetitions @60% of One Rep Max (the greatest amount you can lift once). Exercises– Bench Press, Leg Press, Shoulder Press, Bicep Curl. Can improve muscular strength, muscular endurance and muscular power.
Interval Training	Training which involves alternating work and rest periods. Can be structured to improve either speed or cardiovascular endurance.	Short Interval Training– 10-15 seconds sprinting with 90 seconds slow jog x 10 sets Long Interval Training– 2 minutes steady
Fartlek Training	Speed play. Working at a range of intensities, varying the speeds with no rest periods. Improves cardiovascular endurance.	5 minutes jog to warm up, then 15 seconds sprint, 45 seconds walk, 30 seconds steady, 15 seconds sprint and so on. Work for 15 minutes.
Continuous Training	Working at a low to moderate intensity for a long period of time with NO rest periods.	20-30 minutes steady jogging @60-80 % of Maximum Heart Rate. Improves cardiovascular endurance.
Circuit Training	Performing a series of exercises at different stations often with a brief rest in between to complete a set Improves muscular and cardiovascular endurance.	30 seconds work– 30 seconds rest Order of exercises– Press Up, Squats, Sit Ups, Shuttle Runs, Tricep Dips, Step Ups, Plank, Skipping

Religious Studies

1: What is a worldview?

- ⇒ A worldview is a collection of attitudes, values, stories and expectations about the world around us, which inform our every thought and action.
- ⇒ Everyone has a unique worldview.
- ⇒ A worldview is based on beliefs.
- ⇒ A worldview influences your actions and thoughts.
- ⇒ It makes up who you are as an individual.

Enquiry task: Look at each of the following beliefs and explain how they could influence someone's worldview.

1. Friends are more important than family.
2. There is NO afterlife.
3. Humans should not eat animals.

Challenge: Write out a different interpretation for each belief.

2. What builds a world view?

- ⇒ A worldview is built by personal experiences and beliefs.
- ⇒ This means worldviews can change over your lifetime as you experience more things in your life.
- ⇒ A sibling who has experienced the same things you have will still have a unique worldview as they will have had different feelings and understood things in their own unique way.
- ⇒ This means there is only one worldview that is the same as yours in the whole world.

Enquiry task: Explain 3 ways of your worldview changing since you were in primary school.

Explain 3 ways your worldview has not changed since primary school.

3. To what extent are beliefs unshakable?

- ⇒ There are many beliefs people have different opinions on.
- ⇒ People as a result of their beliefs have gone to great lengths to protect or show their beliefs publicly.
- ⇒ Some people have boycotted companies (refused to buy things from the company) or participated in marches/protests.
- ⇒ Others have gone to jail for their beliefs.
- ⇒ There are even individuals who have been killed for their own beliefs.



Enquiry task:

“There are some beliefs that should NEVER be supported.”

Evaluate the statement.

In your answer you need to include:

1 paragraph supporting the statement

1 paragraph of a different view

1 conclusion showing your personal view point

4. Different beliefs about God.

There are many beliefs about God throughout all of humanity.

These beliefs can be broken down into 3 main categories:

- ⇒ **Atheist** - A person who disbelieves or lacks belief in the existence of God or gods.
- ⇒ **Agnostic** - A person who believes that nothing is known or can be known of the existence or nature of God.
- ⇒ **Theist** - A person who believes in the existence of a god or gods, specifically of a creator who intervenes in the universe.

The belief about God is part of someone's worldview. This belief for some people never changes during their lives. For others their belief in God may change multiple times in their life time.

Enquiry task: Explain 2 beliefs about God. (4 marks)

5. Atheist verses Humanist worldview

An atheist believes that there is no God. Richard Dawkins is an atheist and he has a strong belief that religious “truths” harm society. He argues that just because something is believed to be true doesn't mean it is true. Instead humans have a duty to believe in something only if there is evidence to support its existence. So humans should be motivated to find out the truth about the world.

A Humanist believes that there is no God. However unlike Dawkins they don't believe the belief in a religious “truth” harms society. Instead humans should be motivated to be good people because there is no life after this one.

Enquiry task: Compare a humanist and a atheist view point.

6. Bonhoeffer—Christian case study

Dietrich Bonhoeffer was a German Christian who lived in Germany during WW2 and apposed Hitler's regimes. The reason he did this was because Hitler's ideals went against his own personal religious world view and the rules he lived his life by.



Dietrich Bonhoeffer followed the Golden rule during Hitler's reign. “Do for others what you want them to do for you” Matthew 7:12. As a result of his belief he planned to assassinate Hitler to stop him from causing anymore pain/hurt to people. Bonhoeffer thought this was the most loving action as a Christian.

Enquiry task: Explain how plotting to kill Hitler was the most loving action.

Explain how Bonhoeffer was still following the Golden rule by plotting to kill Hitler.

8. Nicky Cruz—Conversion Case Study

Nicky Cruz was born in Puerto Rico. When he was 15 his parents sent him to live with his brother in New York City. In the 1950s he became a member of the Brooklyn 'Mau Mau' street gang, and later was selected leader of the gang.

His life revolved around drugs, alcohol and violence. He was arrested many times and a court psychiatrist said that Nicky would be soon 'heading to prison, the electric chair and hell'.

No one could reach Nicky until he met a Christian street preacher called David who was trying to stop the violence by teaching the gang about Christianity.

David showed Nicky something he had never experienced before: love, care and interest.

At a religious meeting David's preaching of the gospel message of Jesus' love and forgiveness got through to him. Nicky felt called to go to the front where he prayed and asked God to forgive him.

After this Nicky became a Christian and left the gang.

Enquiry task: Have you had an experience that changed your life dramatically?

Cruz converted to Christianity. Explain how his worldview changed by meeting David.

. Doss—Christian case study

- ⇒ Desmond was an American Christian during WW2.
- ⇒ Desmond was heavily influenced at a young age by the Sixth Commandment of 'Thou shalt not kill'.
- ⇒ During WW2 Desmond felt it was an honour to serve God and country, but he wanted to do it as a medic, by saving life instead of taking life.
- ⇒ Some of Desmond's fellow soldiers believed he should carry a weapon for protection, but he told them that he would put his trust in God. He said that “they could do the fighting and I would do the patching”
- ⇒ In May 1945, his battalion were sent up on the top of a 400-foot-high cliff named Hacksaw Ridge to fight the Japanese.
- ⇒ In this battle about 75 men were wounded and could not move. Desmond was the only medic and would not leave his men.
- ⇒ He stayed at the top of the cliff and let them down one by one to where they could be taken on down to the aid station.
- ⇒ He kept praying: 'Lord, help me to get one more.' And Desmond felt God did help him that day. He got all the men down safely and did not get a scratch from the bullets that were going past him as he worked to help his fellow men.



Enquiry task: How did Doss' worldview effect his service in during WW2?

How might someone argue that Doss was a war hero.

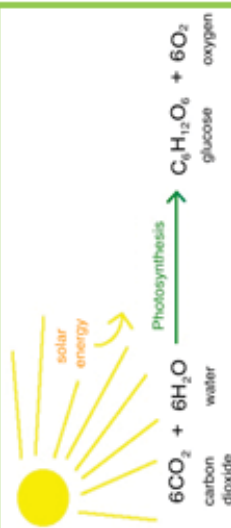
Green plants and algae do not eat food to get their energy. Instead they make their own food by a process called photosynthesis.

Photosynthesis takes place inside plant cells within the chloroplasts.

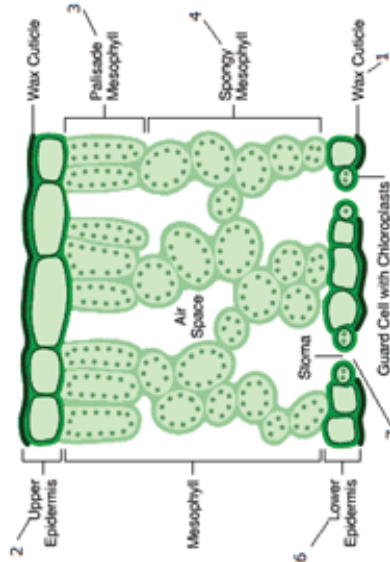
Chloroplasts contain a green pigment called chlorophyll. This absorbs light energy needed for photosynthesis to occur.

Plants use the raw materials; Carbon Dioxide and Water.

With the presence of light energy from the sun, the raw materials are converted into Glucose and Oxygen.



The leaf is an organ that carries out photosynthesis, the tissues work together to make it possible for photosynthesis to take place.



Enquiry Tasks:

1. Produce an overview for gardeners explaining what the optimum conditions would be for growing crops successfully in their greenhouse. Think about what a plant needs to flourish.
2. Produce a guide for gardeners to help them to identify what key nutrients they may be lacking. Think about what the plants would look like if they did not have enough N, P, K Mg

This plant is deficient in nitrate ions. There is poor growth and yellow leaves. Nitrate ions are needed to build proteins and to help the plant grow.



This plant is deficient in phosphate ions. Phosphate ions are needed to ensure good root growth. The leaves are starting to turn purple.



This plant is deficient in Magnesium ions. Yellow leaves start to form, so rate of photosynthesis is reduced. Magnesium ions are needed for photosynthesis.



This plant is deficient in Potassium ions. Potassium ions are needed for making flowers and fruit. The leaves are turning yellow, with dead spots.



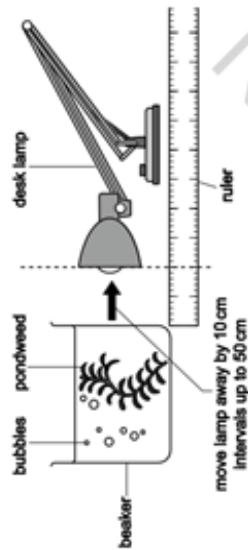
Keyword	Definition
Photosynthesis	Process carried out where plants make their own food. Carbon Dioxide + Water → Glucose + Oxygen
Chlorophyll	Green pigment in chloroplasts of plant cells. It enables photosynthesis to take place.
Chloroplasts	Contain the green pigment chlorophyll; the site of photosynthesis.
Waxy Cuticle	Waxy layer, prevents water loss.
Upper Epidermis	Thin and transparent allowing light to pass through.
Palisade Mesophyll	Main region for photosynthesis. Lots of palisade cells containing lots of chloroplasts.
Spongy Mesophyll	Cells are more loosely packed. Contains air spaces between cells allowing gas exchange.
Lower Epidermis	Contains stomata to regulate the loss of water vapour (transpiration)
Stomata	Each stomata surrounded by a pair of guard cells. Guard cells control whether they're open or closed.

The Aim of the Practical:

To find out what happens to the rate of photosynthesis when we change the light intensity.

Experimental Method:

1. Put a 10cm piece of pondweed into a beaker of water, making sure the cut edge is at the top.
2. Use a ruler to position a light source 1 metre away from the pondweed.
3. Start the stopwatch and count the number of bubbles produced in 1 minute.
4. Repeat 3 times and record results in a table.
5. Move the light source so it is 80cm away from the pondweed and repeat steps 1-4.
6. Repeat for distances 60, 40 and 20cm.



The rate of photosynthesis can be calculated using the following equation:

$$\text{Rate} = \frac{\text{amount of oxygen produced}}{\text{time}}$$

Health & Safety: care with lamps—burns, turn off when not in use. Clean up spills immediately, do not handle electrical items with wet hands or allow water to splash on equipment.

Key Terminology:

Chloroplast: Structure within a plant cell where photosynthesis happens.

Chlorophyll: The chemical inside chloroplasts that allows photosynthesis to happen.

Photosynthesis: when plants use carbon dioxide and water to make glucose (and oxygen). Happens in the chloroplast and needs light energy to happen.

Limiting Factor: A factor that can limit the rate of photosynthesis, for example, availability of light, CO₂, chlorophyll or water.

Variables:

Independent Variable: The distance of the lamp from the plant.

Dependent Variable: The amount of oxygen/bubbles produced.

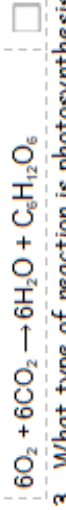
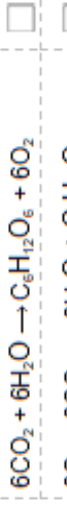
Control Variables: Temperature, pondweed, light source

Enquiry Tasks

1. What is the correct balanced equation for photosynthesis?



2. What is the word equation for photosynthesis?



3. What type of reaction is photosynthesis?

Aerobic ☐

Endothermic ☐

Exothermic ☐

4. What is an endothermic reaction?

5. A student investigated the effect of light intensity on the rate of photosynthesis. The diagram shows the apparatus used.

Sodium hydrogen carbonate solution releases carbon dioxide gas for the pondweed.

This is the method used.

1. Place the pondweed at 5 cm from the light source.

2. Measure the rate of photosynthesis by counting the number of bubbles produced in 1 minute.

3. Repeat with the pondweed at 10 cm and at 20 cm from the light source.

Counting the number of bubbles produced in 1 minute is not an accurate way to measure the rate of photosynthesis.

Suggest two ways the method could be improved to measure the rate of photosynthesis more accurately.

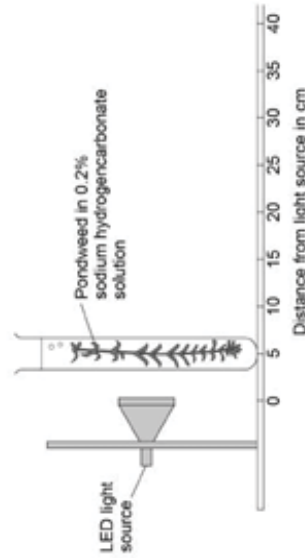
1. _____ 2. _____

6. The LED light source does **not** get hot.

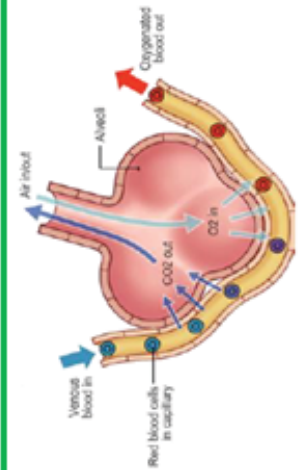
Explain why it is important that the pondweed remains at a constant temperature.

7. Describe how the student could change the method to investigate the effect of carbon dioxide concentration on the rate of photosynthesis. You should include:

- how to change the independent variable
- two control variables.



Keyword	Definition
Respiration	Process in living things which oxygen is used to release the energy from food. $\text{Glucose} + \text{Oxygen} \rightarrow \text{Carbon Dioxide} + \text{Water} (+\text{energy})$
Aerobic Respiration	Respiration that requires oxygen.
Anaerobic Respiration	Respiration without oxygen.
Lactic Acid	A chemical produced during anaerobic respiration
Mitochondria	Structures in the cytoplasm of all cells where aerobic respiration takes place.
Oxygen Debt	The amount of extra oxygen required by the body for recovery after vigorous exercise.
Alveoli	Tiny air sacs in the lungs, where gas is exchanged during breathing.
Bronchi	Branches off the trachea that distribute air to both lungs.
Bronchioles	Branches of the bronchi, that distribute the inhaled air throughout all of the lungs.
Diaphragm	Expands and moves down so lungs have room to fill with air – inhalation. Contracts and moves upwards to force air out of the lungs (exhalation).
Lung	Soft organ that inflates to draw in oxygenated air and deflates to expel air.
Trachea	Windpipe, air passes between mouth and lungs.



Aerobic Respiration

Respiration is a series of reactions that takes place in the cells of animals and plants. Energy is released in the reaction. The mitochondria, found in the cell cytoplasm, is where respiration happens.



'Energy' is in brackets because it is not a substance. This type of respiration, where oxygen is used, is known as aerobic respiration. Oxygen (from breathing) is carried from the lungs to all the cells of the body in the blood. The waste products (carbon dioxide and water) are taken away from the cells by the blood and breathed out from the lungs.

Anaerobic Respiration

Although anaerobic respiration does release some energy, it does not release as much as aerobic respiration does.



The lactic acid produced during anaerobic respiration builds up in muscles. This can be felt as an aching in muscles during or after exercise.

Anaerobic Respiration In Microbes

Enquiry Task:

Identify commercial uses of anaerobic respiration, explain how anaerobic respiration is used to make the product.



Anaerobic respiration happens in microorganisms such as bacteria because they need to release energy from glucose.

Yeast (unicellular fungi), carry out a process called fermentation. The ethanol (alcohol) is useful for brewers, and carbon dioxide is useful to bakers because it helps their bread rise.

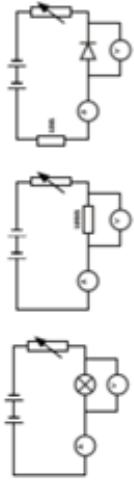
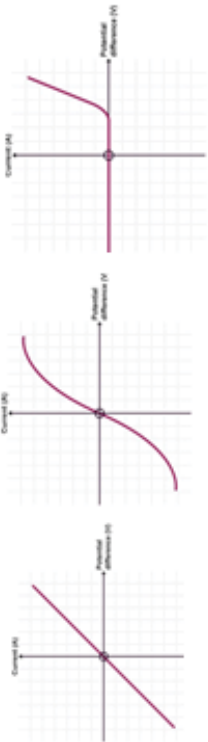
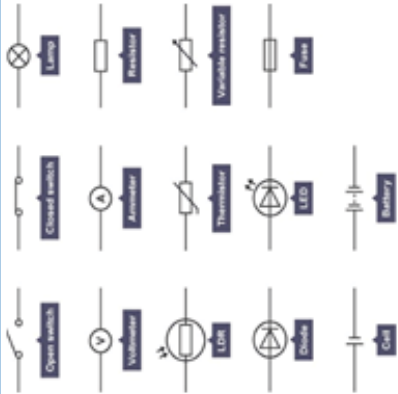
The alveoli are adapted to make gas exchange in the lungs happen easily and efficiently.

- Alveoli give the lungs a large surface area.
- Alveoli have thick cell walls (just one cell thick, this gives a short diffusion distance)
- Alveoli are surrounded by lots of blood capillaries, giving them a really good continuous blood supply. The gases move by diffusion from where they have a high concentration to a lower concentration. The concentration gradient is maintained by the moving blood.

Oxygen diffuses from the air in the alveoli into the blood. Carbon dioxide diffuses from the blood into the air in the alveoli.



Enquiry Task: Compare different exchange surfaces (gills, intestines etc.) how are they all similar?

Equations & Maths	Required Practical Activities	Resistance
<u>Equations:</u> Charge: $C = It$ Potential Difference = $V = IR$ Energy Transferred = $E = Pt$ Energy Transferred = $E = QV$ Power = $P = VI$ Power = $P = I^2R$	1. Investigating Resistance in a Wire <u>Independent Variable:</u> length of wire <u>Dependent Variable:</u> resistance <u>Control Variables:</u> type of metal, diameter of the wire. <u>Experimental Conclusion:</u> As the length of the wire increases, the resistance of the wire also increases. 2. Investigating Series & Parallel Circuits with Resistors <u>Independent Variable:</u> circuit type (series or parallel) <u>Dependent Variable:</u> Resistance <u>Control Variables:</u> number of resistors, type of power source <u>Experimental Conclusion:</u> adding resistors in series increases the total resistance of the circuit. In a parallel circuit, the more resistors you add, the smaller the resistance. 3. Investigating I-V Relationships in Circuits (using a filament bulb, ohmic conductor, diode) <u>Independent Variable:</u> potential difference/volts <u>Dependent Variable:</u> current (A) <u>Control Variable:</u> number of components (e.g. 1 filament bulb, 1 resistor), type of power source. Set up the circuits shown below and measure the current and potential difference.  Draw graphs of the results.	Voltage (V) = current (A) x Resistance (Ω) V=IR  $V = I \times R$ $I = \frac{V}{R}$ $R = \frac{V}{I}$ <u>Graphs of I-V Characteristics for Components in a Circuit</u> <u>Ohmic conductor:</u> the current is directly proportional to the potential difference—it is a straight line (at a constant temperature) <u>Filament lamp:</u> as the current increases, so does the temperature. This makes it harder for current to flow. The graph becomes less steep. <u>Diode:</u> current only flows in one direction. The resistance is very high in the other direction which  Current & Circuit Symbols  <u>Current:</u> the flow of electrical charge <u>Potential difference (voltage):</u> the push of electrical charge <u>Resistance:</u> slows down the flow of energy
Charge Electric current is the flow of electric charge. It only flows when the circuit is complete. The charge is the current flowing past a point in a given time. Charge is measured in coulombs. <u>Calculating charge</u> Charge flow (C) = current (A) x time (s) $Q = It$  $Q = C \times V$ $C = \frac{Q}{V}$ $V = \frac{Q}{C}$ Potential difference = current x resistance $V (V) = I (A) \times R (\Omega)$  $V = I \times R$ $I = \frac{V}{R}$ $R = \frac{V}{I}$		

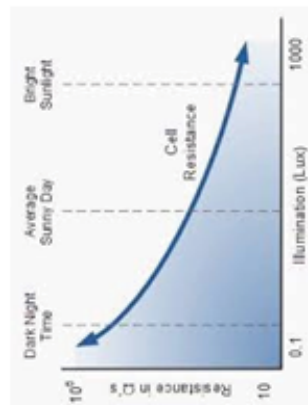
Circuit Devices

LDR—Light Dependent Resistor



An LDR is dependent on light intensity. In bright light the resistance falls and in the dark the resistance is higher.

Uses of LDRs: Outdoor night lights, burglar detectors.



Thermistor



A thermistor is a temperature dependent resistor. If it is hot, then the resistance is less. If it becomes cold, then the resistance increases.

Uses

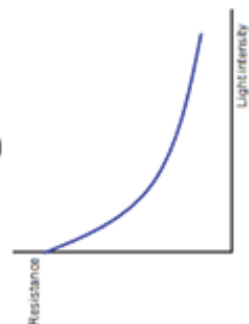


Figure 1

Series & Parallel Circuits

Series Circuits: Once one of the components is broken then all the components will stop working.

Potential difference: the total p.d. of the supply is shared between all the components.

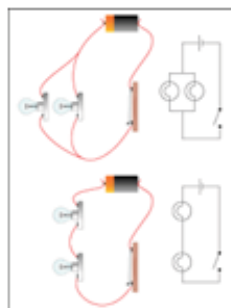
$$V_{\text{total}} = V_1 + V_2$$

Current: wherever the ammeter is placed in a series circuit the reading is the same.

$$I_1 = I_2 = I_3$$

Resistance: In a series circuit, the resistance will add up to make the total resistance.

$$R_{\text{total}} = R_1 + R_2$$



Parallel Circuits: they are much more common—if one component stops working, it will not affect the others. This means they are more useful.

Potential difference: this is the same for all components

$$V_1 = V_2$$

Current: the total current is the total of all the currents through all the components

$$I_{\text{total}} = I_1 + I_2 + I_3$$

Resistance: adding resistance reduces the total resistance.

Electricity in the Home:

AC—alternating current. Constantly changing direction—UK mains supply is 230V and has a frequency of 50 hertz (Hz).

DC—direct current. Supplied by batteries and only flows in one direction.

Cables—most have 3 wires: live, neutral and earth. They are covered in plastic insulation for safety.

Live Wire—provides the potential difference from the mains.

Neutral Wire—completes the circuit.

Earth Wire—protection. Stops the appliance from becoming live. Carries a current if there is a fault. Touching the live wire can cause the current to flow through your body. This causes an electric shock.

Energy Transferred—this depends on how long the appliance is on for and its power.

$$\text{Energy transferred (J)} = \text{power (W)} \times \text{time (s)} \quad E = Pt$$

Energy is transferred around a circuit when charge moves.

$$\text{Energy transferred (J)} = \text{charge flow (C)} \times \text{potential difference (V)} \quad E = QV$$

$$\text{Power (W)} = \text{potential difference (V)} \times \text{current (A)} \quad P = VI$$

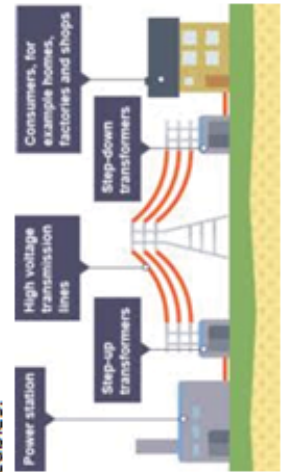
$$\text{Power (W)} = \text{current}^2 (\text{A}) \times \text{resistance } (\Omega) \quad P = I^2 R$$

The National Grid

The national grid is a system of cables and transformers. They transfer electrical power from the power station to where it is needed. Power stations are able to change the amount of electricity that is produced to meet demands. For example, more energy may be needed in the evenings when people come home from work or school. Electricity is transferred at a low current, but high voltage so less energy is lost as it travels through the cables.

Step-up transformers: increase the voltage as the electricity flows through the cables.

Step-down transformers: decrease the potential difference to make it safe.



Draw the circuit symbols for:

- Cell Resistor
- Battery Variable Resistor
- Lamp (bulb) Ammeter
- Fuse Voltmeter
- LED Diode
- LDR Thermistor

What is an electric current?

State the equation that links charge, current and time: _____

Write symbols and units for the following:

Charge: _____

Current: _____

Time: _____

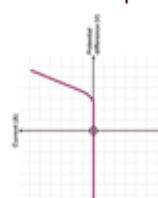
A charge of 12A flows through an electric cooker for 1 hour, how much charge has been used?

State the equation that links current, potential difference and resistance. Remember to include units.

A voltmeter reading is 3V and the resistance is 2Ω . What is the current?

Label the following potential difference/current

graphs:



For a thermistor: as the temperature increases, the resistance _____

Thermistors are used for _____

LDR stands for L _____ D _____ R _____

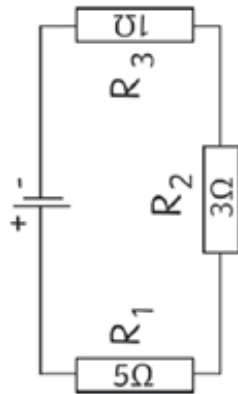
For an LDR: as the light intensity increases, the resistance _____

LDRs are used for _____

In a series circuit is the potential difference shared or the same? _____ is the current shared or the same? _____

In a parallel circuit the potential difference shared or the same? _____ is the current shared or the same? _____

For the circuit below, calculate the total resistance _____



On the diagram, draw where a voltmeter could be positioned to measure the voltage through one of the components.

What is the equation linking energy transferred, power and time?

What are the units for: energy: _____

power: _____ time: _____

State the 2 types of electricity supply:

1. _____ 2. _____

The UK mains supply has an AC supply of _____ V and a frequency of _____ Hz.

Why is energy transferred at such high voltage in cables in the National Grid?

Describe how the following work:

Step-up transformers: _____

Step-down transformers: _____



Relative Formula Mass (M_r)

Calculating the relative formula mass is straightforward.

Compounds have a relative formula mass. If you have a compound like MgCl_2 then it has a relative formula mass, M_r . This is just the relative atomic mass of all of the atoms in the molecular formula added together.

Remember:

A_r = Relative atomic mass (this can be found on the periodic table)

M_r = Relative formula mass (it is the combined relative atomic masses of all of the elements present in the compound).

Example: Find the relative atomic mass of MgCl_2 :

1. Look up the relative atomic masses (A_r) of all the elements in the compound on the periodic table:

A_r of Mg = 24 and the A_r of Cl = 35.5

2. Add up all of the relative atomic masses (A_r) of the atoms in the compound:

$$\text{Mg} + (2 \times \text{Cl}) = 24 + (2 \times 35.5) = 95$$

So the M_r of MgCl_2 = 95

Enquiry Task:

Calculate the M_r of the following compounds:

H_2O CO_2 H_2O_2 NaHCO_3



% Mass

This is really simple, if you learn this formula:

$$\% \text{ mass of an element in a compound} = \frac{A_r \times \text{number of atoms in that element}}{M_r \text{ of the compound}} \times 100$$

Example: Find the % mass of sodium in sodium carbonate, Na_2CO_3

A_r of sodium = 23, A_r of carbon = 12, A_r of oxygen = 16

M_r of Na_2CO_3 = $(2 \times 23) + 12 + (3 \times 16) = 106$

% mass of sodium = $\frac{23 \times 2 \times 100}{106} = 43\%$

Enquiry Task:

1. Find the % mass of hydrogen in H_2O
2. Find the % mass of oxygen in CO_2
3. Find the % mass of carbon in NaHCO_3

A more complicated example:

A mixture contains 20% iron ions by mass. What mass of iron chloride (FeCl_2) would you need to provide the iron ions in 50g of the mixture? A_r of Fe = 56, A_r of Cl = 35.5.

Enquiry Task:

1. Find the mass of iron in the mixture.
The mixture contains 20% iron by mass, so in 50g there will be $50 \times 20 \div 100 = 10\text{g}$ of iron.
2. Calculate the % mass of iron in iron chloride
*Percentage mass of iron = $A_r \times \text{number of atoms of that element} \div M_r \text{ of the compound} \times 100$
Therefore, $56 \div 126 \times 100 = 44.44\%$*
3. Calculate the mass of iron chloride that contains 10g of iron. *Iron chloride contains 44.44% iron by mass, so there will be 10g of iron in $10 \div (44.44 \div 100) = 22.5\text{g}$. So you need 22.5g of iron chloride to provide the iron in 50g of the mixture.*



The Mole

The Mole is simply the name given to an amount of a substance. Chemical amounts are measured in moles. The symbol for the unit mole is mol. The mass of one mole of a substance in grams is numerically equal to its relative formula mass. One mole of a substance contains the same number of the stated particles, atoms, molecules or ions as one mole of any other substance.

The number of atoms, molecules or ions in a mole of a given substance is the Avogadro constant. **Remember this:** the value of the Avogadro constant is 6.02×10^{23} per mole.

We can find out missing information by using the equation:

$$\text{Number of moles} = \frac{\text{mass (g)}}{A_r} \quad \text{or} \quad \frac{\text{mass (g)}}{M_r}$$

Or by rearranging to :

$$\text{Mass (g)} = \text{number of moles} \times A_r$$

or

$$\text{number of moles} = \frac{\text{Mass (g)}}{M_r}$$

Worked example 1:

How many moles of sulfuric acid molecules are there in 4.7g of sulfuric acid (H_2SO_4)? Give your answer to 1 significant figure.

Mass = 4.7 g	so	m	then	4.7 = 0.05 mol	
M_r of H_2SO_4 = 98					M_r 98

Worked example 2:

What is the mass of 7.2×10^3 moles of aluminium sulfate ($Al_2(SO_4)_3$)? Give your answer to 1 decimal place.

$$\text{mol} = 7.2 \times 10^3 \quad \text{so} \quad 7.2 \times 10^3 \times 342 = 2.5 \text{ g}$$

$$M_r \text{ of } Al_2(SO_4)_3 = 342$$

Enquiry Task:

1. How many moles of helium atoms are there in 0.04g of helium?
2. What is the mass of 20 moles of calcium carbonate $CaCO_3$? Answer in kg.
3. Calcium carbonate decomposes to calcium oxide in a kiln in the following reaction: $CaCO_3 = CaO + CO_2$
Calculate the mass of calcium oxide that can be produced when 300 tonnes of calcium carbonate is heated.
4. 0.10g of hydrogen reacts with 3.55g of chlorine to produce 3.65g of hydrogen chloride. Use this information to work out the balancing numbers for hydrogen chloride.



Conservation of Mass

The law of conservation states that no atoms are lost or made during a chemical reaction so the mass of the product equals the mass of the reactants.

Chemical reactions can be represented by symbol equations which are balanced in terms of the numbers of atoms of each element involved on both sides of the equation.

State symbols s, l, g and aq are used in symbol equations.

When hydrogen molecules react with chlorine molecules, they make hydrogen chloride molecules:



This equation shows the reactants and products, but it is not balanced.



This balanced equation shows that **one** hydrogen molecules reacts with **one** chlorine molecule to form **two** molecules of hydrochloric acid.

Enquiry Task:

1. What is the law of conservation of mass?
2. Why might some reactions appear to show a change in mass?
3. Give two examples of a reaction where a change in mass may appear to take place.

Limiting Reactants

In a chemical reaction involving two reactants, it is common to use an excess of one of the reactants to ensure that all the reactant is used up. The reactant that is completely used up is called the **limiting reactant** because it limits the amount of products.

Worked example:

4.8g of magnesium ribbon reacts with 7.3g of HCl.

Which is the limiting reactant?



Remember: Number of moles = $\frac{\text{mass (g)}}{A_r}$ or $\frac{\text{mass (g)}}{M_r}$

A_r : Mg (24) and A_r : Cl (35.5)
 4.8g of Mg = $4.8/24$ moles = 0.2 mol
 7.3g of HCl = $7.3/36.5$ moles = 0.2 mol

From the balanced equation: **1 mole of Mg reacts with 2 moles of HCl**, this is the ratio, therefore **0.2 mol of Mg will need 0.4 mol of HCl** to react completely, there is only 0.2 mol of HCl, so the HCl is the limiting reactant.

Sometimes it is easier to draw a table to help control the information:

Balanced equation	Mg(s)	+	2HCl(aq)	=	MgCl ₂ (aq)	+	H ₂ (g)
Ratio	1		2		1		1
Mass (g)	4.8		7.3				
mol	0.2		0.4				
M_r or A_r	24		35.5				

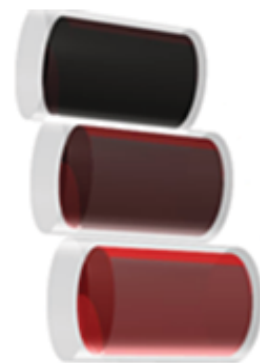
Enquiry Task:

- What is meant by the term 'limiting reactant'?
- If 4.95 g of ethene (C₂H₄) are combusted with 3.25 g of oxygen, what is the limiting reactant?



Concentrations of Solutions

Chemists quote the amount of substance (solute) dissolved in a certain volume of the solution. The units used to express the concentration can be grams per decimetre cubed (g/dm³). A decimetre (1dm³) cubed is equal to 1000cm³.



The blackcurrant juice is getting more concentrated – the darker colour indicates more squash is in the same volume of its solution.

If you know the mass of the solute dissolved in a certain volume of solution, you can work out the concentration using the equation:

$$\text{Concentration} = \frac{\text{amount of solute (g)}}{\text{Volume of solution (dm}^3\text{)}}$$

Remember: if you are using cm³ to multiply the volume by 1000 to convert to dm³

Worked example:

50g of sodium hydroxide is dissolved in water to make up 200cm³. What is the concentration in dm³?

$$\text{Concentration (g/dm}^3\text{)} = \frac{50\text{g}}{200\text{ cm}^3} = 0.25\text{g/cm}^3$$

$$\text{then convert to dm}^3 = 0.25\text{g/cm}^3 \times 1000 = 250\text{g/dm}^3$$

Enquiry Task:

- Calculate the concentration in g/dm³ for 50g of sodium chloride in 2.5 dm³ of water.
- Calculate the concentration in g/dm³ of 1.4g of potassium carbonate in 855cm³ of water.
- A teacher has a solution of lithium fluoride with a concentration of 72.6g/dm³. Calculate the mass of lithium fluoride dissolved in 25.0cm³ of solution.



Need to Know Dictionary: English

Word	Definition
Stanza	A group of lines in a poem. Like a 'paragraph' in a poem.
Rhyme	The repetition of similar sounds.
Enjambment	When the lines of a poem run on without a pause.
Caesura	A pause within the line of a poem.
Metaphor	A metaphor is a word or a phrase used to describe something as if it were something else.
Extended metaphor	A metaphor that is repeated throughout a text.
Alliteration	The repetition of the same letter at the beginning of two or more words.
Tone	The feelings and atmosphere created by language.
Identity	Identity is the qualities, beliefs, personality traits, appearance, and/or expressions that characterise a person or group.
Imagery	Where the writer uses words to paint a picture to help the reader visualise what is being described.

Need to Know Dictionary: Maths

Word	Definition
quadratic equation	contains terms with powers no higher than two
construct	to draw a shape, line or angle accurately using a compass and straightedge (ruler)
perpendicular	at right angles to the horizon or another object
loci	a set of points that satisfy a particular condition or rule
data	data is a collection of information gathered by observation, questioning or measurement
index (indices)	an index (exponent, power or order) is a small number placed to the upper-right of a base number which shows how many copies of the base number are multiplied together
standard form	standard form is another name for scientific notation, i.e. $876 = 8.76 \times 10^2$
surds	• another name for an irrational number. • a surd is a real number that can be written as a nonrepeating or nonterminating decimal but not as a fraction because the decimal goes on forever without repeating
rational expressions	rational expressions are polynomial fractions
prime factorisation	is finding which prime numbers multiply together to make the original number



Need to Know Dictionary: Science

Word	Definition
Ionic	the electrostatic force of attraction between positively and negatively charged ions
Covalent bond	the bond between two nonmetal atoms that share one or more pairs of electrons
Intermolecular Forces	the attraction between the individual molecules in a covalently bonded substance
Photosynthesis	the process by which plants make food using carbon dioxide, water, and light
Endothermic reaction	a reaction that requires a transfer of energy from the environment
Aerobic Respiration	an exothermic reaction in which glucose is broken down using oxygen to produce carbon dioxide and water and release energy for the cells
Anaerobic respiration	an exothermic reaction in which glucose is broken down in the absence of oxygen to produce lactic acid in animals
Potential Difference	a measure of the work done or energy transferred to the lamp by each coulomb of charge that passes through it. The unit of potential difference is the volt (V)
Resistance	resistance (in ohms, Ω) = potential difference (in volts, V) $\div$ current (in amperes, A)
Electrons	tiny negatively charged particles that move around the nucleus of an atom

Need to Know Dictionary: Geography

Word	Definition
Extreme Environment	A habitat that is considered very hard to survive in due to its considerably extreme conditions such as temperature
Distribution	The way in which something is spread over an area.
Desertification	The process whereby land which once was fertile is gradually turned into a desert.
Inhabitable	An environment that is harsh and difficult to live in.
Greenhouse effect	The build up of certain gases which become trapped in the atmosphere, and are slowing heating up the earth's surface.
Atmospheric Circulation	These are the circular air movements in cells in the atmosphere (air). The cells join together to form global atmospheric circulation.
Primary effects	are caused directly by the natural hazard (a primary effect of an earthquake would be the ground shaking)
Secondary effects	are caused by the primary effects (a secondary effect of an earthquake could be a landslide caused by the shaking ground)
Immediate responses	people reacting straight away. Could include search and rescue, food, water or shelter.
Long term responses	people acting to help people's lives return to normal. This could include rebuilding houses and buildings.
Climate change	changes in the climate which are thought to be caused by human impact
International agreement	when a range of different countries from around the world make an agreement



Need to Know Dictionary: French

- 1 Infinitive (noun)** - The verb in its unchanged state. In French, infinitives end in either -er, -ir or -re. The Latin root word 'fin' means 'end'.
- 2 Preposition (noun)** - A word that tells you where or when something is in relation to something else. In French, some prepositions are followed by de (pronounced 'duh'). From the Latin for 'putting before.'
- 3 Irregular (adjective)** - Not following the usual pattern. It's really important you learn irregular verbs because they don't follow the usual pattern. The prefix 'in' can mean 'opposite of' the Latin root word 'regularis' means 'having rules'.
- 4 Reflexive pronoun (noun)** - Reflexive pronouns are used with reflexive verbs which describe an action that someone does to themselves. Some French verbs have a reflexive pronoun in front of the verb. The French reflexive pronouns are me, te, se, nous, vous, and se.
- 5 Cognate (noun)** - Cognates are words that share similar meaning, spelling and pronunciation. When trying to work out meaning, you should look for cognates. From the Latin word meaning 'of common descent'.
- 6 Auxiliary verb (noun)** - An auxiliary verb (aka a helping verb) is a verb that helps another verb express its tense, mood, or voice. To form the perfect tense, you need an auxiliary and a past participle. The two auxiliary verbs in French are être, which means 'to be,' and avoir, which means 'to have.'
- 7 Imperfect tense (noun)** - Used to describe things in the past. We used the imperfect tense to talk about what used to happen. The prefix 'im' is used to form words with the opposite meaning.
- 8 Abstract noun (noun)** - A noun that refers to a thing that does not exist as a material object. Honesty and loyalty are examples of abstract nouns. Other types of nouns include concrete, proper, and collective.
- 9 Conjugate (verb)** - To change the verb depending on who is performing the action or when the action is taking place. We are now able to conjugate verbs in the present and the perfect tense. The prefix 'con' means to 'join'.
- 10 Tense (noun)** - A set of forms taken by a verb to indicate time. You should use a variety of tenses in your speaking and writing, in order to achieve a higher grade. From the Latin word 'tens' meaning 'time'.

Need to Know Dictionary: History

Word	Definition
1900s	The correct way to write "the nineteen hundreds" as a number.
Century	100 years
Contemporary	At the same time of the event or person
Decade	10 years
Democracy	Leaders selected by a voting system by those that are led.
Election	To vote for something
Morale	A feeling about how well or badly something is going.
Persecution	To treat a person badly over a long period of time.
Propaganda	Information that is designed to alter the way people think.
Racism	Hatred based on race or background of a person



Need to Know Dictionary: Engineering Design

Word	Definition
Design Cycle	A series of four phases that designers will use in order to design effective and successful products. Using this four phased system reduces the likelihood of errors being made and opportunities being missed.
Identify	The first phase of the design cycle, where designers research the design brief, conduct analysis, primary and secondary research and summarise their findings.
Design	The second phase of the design cycle, where designers create a design specification, create a variety of designs and evaluate these to select the best solutions.
Optimise	The third phase of the design cycle, where designers develop the chosen design or designs. This includes prototyping, error proofing and Design for Manufacture and Assembly (DFMA).
Validate	The fourth and final phase of the design cycle, where designers evaluate their final prototypes and consider ways the product could be further developed.
Prototype	A prototype is a model of a product used to explore design alternatives, test theories, confirm performance and ensure the product is safe and user-friendly. Engineers use prototypes to figure out specific unknowns still present in the design.
Error proofing	Part of the optimise phase, this is where designers develop the design to make it harder for the end user or an assembly line worker to use or assemble the product wrongly.
Casting	The process of melting a metal and pouring or injecting it into a mould in order to form a particular shape. We will do this with pewter.
Disassembly	When a designer takes apart a product in order to learn from its design and construction. Companies do this with rival products. Disassembly may also happen at the end of a product's life so that it can be repaired or recycled.
Product analysis	When a product is analysed in detail, so that lessons can be learnt from its design and construction. This may lead to improved designs in the future.

Need to Know Dictionary: Art

Word	Definition
Satire	the use of humour, irony, exaggeration, or ridicule to expose and criticise people's stupidity or vices, particularly in the context of contemporary politics and other topical issues.
Street Art	Street art is a form of artwork that is displayed in public on surrounding buildings, on streets, trains and other publicly viewed surfaces.
Controversial social activist political	Giving rise or likely to give rise to controversy or public disagreement. a person who works to achieve political or social change, especially as a member of an organisation with particular aims. relating to the government or public affairs of a country.
abstract expressionism	Abstract expressionism is the term applied to new forms of abstract art developed by American painters in the 1950s & 1960s. It is often characterised by gestural brush-strokes or mark-making, and the impression of spontaneity
subversive	refers to a process by which the values and principles of a system in place are contradicted or reversed in an attempt to transform the established social order and its structures of power, authority, hierarchy, and social norms.
Epigrams expressionistic	An epigram is a brief, interesting, memorable, and sometimes surprising or satirical statement. Something that's expressionistic uses emotions rather than realism to express an artistic idea.
visual language	The visual language is a system of communication using visual elements.



Need to Know Dictionary: Sports Studies

Word	Definition
Risk assessment	The process of identifying hazards (things which can cause harm) which currently exist or may appear in the activity area.
Emergency procedures	What to do in the event of an accident or other emergency. Often follows procedures (an order) to minimise further risk and chaos, whilst maximising safety.
Safe practice	organising the group and the activities appropriately depending on the space, number of participants and equipment being used.
Timing	considering the length of activities.
Adaptability	making changes to the session if people find it too easy or too hard.
Reliability	turning up when you say you will and running to time.
Leadership style	The leader's main behaviours when directing, motivating, guiding and managing groups of people. These can be autocratic, democratic or laissez-faire.
Communication	The process of sending or receiving information. Can be verbal (spoken) or non-verbal. Should use appropriate language and consider age of participants when providing technical terms.
Positioning	Considering where to be stood in relation to the group when giving demonstrations and explanations.
Creativity	Design of activities to ensure they are relevant for the group and activity, to promote engagement and interest.

Need to Know Dictionary: Religious Studies

Word	Definition
Bioethics	the study of what is right and wrong in biological and medical research.
Euthanasia	painless killing of a patient suffering from an incurable and painful disease or irreversible coma.
Adultery	voluntary sexual intercourse between a married person who is not their spouse.
Cohabitation	a couple living together and having a sexual relationship without being married to one another.
Polygamy	the practice or custom of having more than one wife at the same time.
Procreation	bringing a baby into the world; producing offspring.
Fundamentalist Christians	believe the statements in the Bible are literally true and believe there are certain basic beliefs that are essential to the Christian faith.
Liberal Christians	believe that the Bible's authors were guided by God, but that not everything they wrote is a literal account of what actually happened.
Agape	a selfless and unconditional type of love.
Enslavement	The moment at which a human being receives a soul.



Need to Know Dictionary: Hospitality and Catering

Word	Definition
Climate change	Changes in the earth's temperature that can lead to unusual and extreme weather
Carbon footprint	A measure of how much food production contributes towards the production of greenhouse gases
Food provenance	Where food and the ingredients in them originally come from before they reach the Hospitality and Catering industry
Appetising	Where food is prepared, cooked and served so well that people want to eat it
Organoleptic	The quality of food that people experience with their senses
Senses	The ability of the body to react to things through sight, taste, sound, smell and touch
Mise-en-place	A catering term meaning preparation time before you start to cook. May include preparing self and area, collecting equipment, chopping vegetables etc
Contingencies	What to do if things go wrong. This will be included when creating a production plan for a dish. For example- Do not over rub fat in with the flour. If I do, start again as the pastry will be tough.
Special Points	Things to consider when doing each step of your production plan. For example reference should be made to adjustments in oven temperatures or to check length of cooking time for vegetables to serve hot.
Dovetailing definition	To cook several things at the same time in the most logical order. For example if you are cooking a main and dessert you may need to start part of the dessert off first and then do part of a main course. Whilst the main is cooking you can then go back to finish the dessert. The dishes need to be served together.

Need to Know Dictionary: Creative iMedia

Word	Definition
Target Audience	A specific group of people which a media product is aimed at.
Audience segmentation	A marketing strategy based on identifying subgroups within the target audience in order to deliver more tailored messaging for stronger connections.
Media purposes	The purpose of a media product eg to entertain, educate, advertise, promote, inform.
Client requirements	A document which sets out what the client requires in a media product which would make it suitable for the target audience and the purpose.
Audience consumption	The way in which audiences engage with media products eg viewing a programme, playing an online game, reading a blog.
Brand identity	The association the audience makes with the brand which has been built up over time and reinforced by the advertising campaigns and their placement.
Mind map	Used by media production planning teams to help structure initial ideas for a product.
Mood board	Used by designers to generate design ideas and help create a 'feel' for a media product.
Work Plan	A plan or overview showing the tasks/activities that need to be completed in order to create a media product.
Visual representations	These can include colour, shape, texture, movement, symbols and signs.
Visualisation diagram	A sketch with annotations to show what a final media product will look like.



Need to Know Dictionary: Child Development

Word	Definition
Antibodies	Proteins made by the body that can latch on to foreign viruses and bacteria, making them ineffective.
Immunity	If you have a high enough antibody level to protect you against a particular infection, you are immune.
Colostrum	A yellowish breast milk, rich in antibodies and high in protein, produced from the end of pregnancy through the early days of breastfeeding
Combination feeding	A method which combines two or more feeding types (e.g. breastfed and formula fed, breast fed and bottle fed with expressed milk)
Engorged breasts	An uncomfortable fullness of the breasts, experienced at any time during breastfeeding; most often within the 36 hours after delivery or when mothers first wake up in the morning if their babies don't feed at night.
Expressed breast milk	Squeezed from the breast by hand or pump, which is stored or fed to the baby via a bottle.
Foremilk and Hindmilk	Terms for the milk produced at the beginning (foremilk) and end (hindmilk) of a particular feed. Foremilk is mostly water combined with other nutrients, hindmilk is richer in fat helping a baby to gain weight.
Mastitis	An inflammation of the breast tissue, where the breast becomes swollen, hot and painful. Can result in an infection.
Rooting	An active sign of hunger evident as a baby moves their head around looking for a nipple to latch on to
Tongue Tie	A condition where the tissue connecting the tongue to the floor or the mouth is short and tight, restricting tongue movement and breastfeeding ability.

Need to Know Dictionary: Health and Social Care

Word	Definition
Self-concept	A child begins to develop a sense of self.
Self esteem	It relates to how much you value yourself and feel capable of doing things
Socialisation	This is the process of becoming social by learning social rules and norms with regard to what is appropriate behaviour
Primary socialisation	Attitudes and beliefs are learnt by observing and imitating family members.
Secondary socialisation	Peers are a main source of information about how to act.
Physical Development	Development of the BODY
Intellectual Development	Development of the MIND/BRAIN
Emotional Development	All about our FEELINGS
Social Development	All about RELATIONSHIPS with other people
Motor skills	Movements and actions of the muscles.



Need to Know Dictionary: Business Studies

Word	Definition
Entrepreneur	A person who takes a risk by starting and running a business enterprise.
Capital	Money used to start or develop a business.
Growth	When a business becomes larger, for example by making more products or operating more places where goods and services are sold.
Competitor pricing	When a price is set based on the prices charged by competitor businesses for similar products.
Focus groups	Selected small groups of customers who give their opinion on products.
Innovation	The improvement of an original idea, which will often involve using new processes.
Customer service	The name given to an area of the business that deals with customer enquiries.
Cash flow forecast	A statement showing the expected flow of money in and out of the business over a period of time.
Fixed costs	Costs that stay the same as output changes.
Expenditure	Money that the business pays out.