The Trafalgar School at Downton

Knowledge Organiser

Year 9

2026/2027

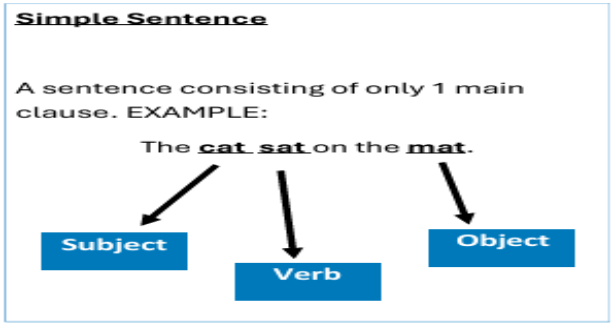
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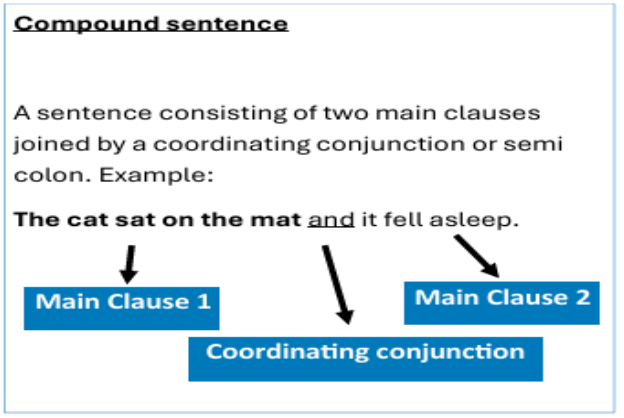
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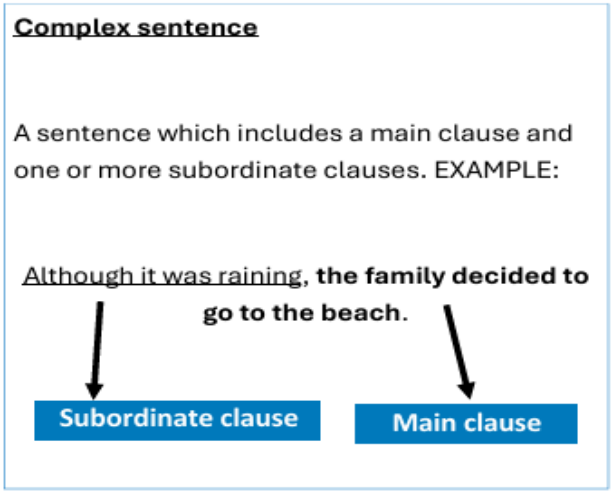
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Sentence Construction	
Capital letters	Used at the beginning of sentences and for proper nouns.
Main clause	A clause that makes sense on its own.
Subordinate clause	A clause that does not make sense on its own.
Subordinating conjunction **(I SAW A WUBUB)**	Introduces a subordinate clause e.g. If, since, as, when, although, while, after, before, until, because (not an exhaustive list).
Coordinating Conjunctions **(FANBOYS)**	A word that connects mains clauses or phrases e.g. for, and, nor, but, or, yet, so.
Declarative sentence	Makes a statement.
Imperative sentence	A command or an instruction.
Interrogative sentence	Asks a question.
Exclamatory sentence	Expresses strong emotion and ends with an exclamation mark.
Fragment	A 'sentence' that does not contain a verb and/or subject.
Simple sentence	A sentence consisting of only one main clause.
Compound sentence	A sentence which includes two main clauses joined by a semi-colon or coordinating conjunction.
Complex sentence	A sentence which includes a main clause and one or more subordinate clauses.







Punctuation	
Full stops	Used to mark the end of a sentence.
Commas	• To separate main and subordinate clauses • To separate items in a list. • After introductory clauses, phrases, discourse markers.
Apostrophes	Used to show omission or possession.
Semi-colon	• Used between two main clauses that are closely related. • Used in-between item of a list that are already complex due to the inclusion of extra detail.
Colon	• To introduce a list, information, ideas and explanation. • To introduce quoted information.
Dash	• To add extra information. • To signal a change in tone.
Hyphen	Used to combine words into a compound word e.g. well-being
Brackets	• Separates extra information in an informal style (round) • Gives alternatives (round) • Around an ellipsis where words have been omitted from a quotation [square]
Ellipsis	Used to create suspense, show words are missing or show a trailing off thought.

Word Types	
Abstract Noun	An idea or a concept.
Noun	A name, place or thing.
Proper Noun	Names of people and places which need a capital letter.
Adjective	A word that describes a noun.
Verb	An action word (doing word) or a state (be, have)
Adverb	A word that describes a verb. An adverb often ends with –ly.
Modal Verb	A verb that shows necessity, possibility or certainty. e.g. should, could, will, must.
Preposition	Indicates position, time or place.
Personal Pronoun	Used instead of the name for a person/thing. e.g. you, he, I, she
Collective pronoun	Singular – someone, somebody, something etc Plural – they, we, them etc

ENGLISH - LORD OF THE FLIES

Key Vocabulary	Definitions
Allegory	Story with a hidden meaning in which characters and events stand for something symbolic.
Analepsis	A flashback which lets us know previous events.
Anarchy	The total absence of law and order, leading to terrible behaviour.
Antagonist	A person who purposefully works against the protagonist in an opposing or hostile way.
Atavism	Regression to primitive and savage behaviour.
Civilisation	The stage of human social and cultural development and organisation that is considered most advanced.
Democracy	A system in politics where individuals are free to vote and state their views.
Dictatorship	Opposite to a democracy. A leader has complete power and supresses free speech.
Foil	A contrasting character used to highlight the qualities shown be another character.
Foreshadowing	A hint about a future event in a text.
Imagery	Words/phrases used in writing that create images in a reader's mind.

Key Vocabulary	Definitions
Martyr	A person who dies for their beliefs. Typically, these are religious beliefs.
Megalomaniac	A person driven by increasing and obtaining power.
Microcosm	A smaller representation of a larger community/civilisation.
Outsider	A person who is marginalised/ostracised by a group because they are seen as different.
Pathetic fallacy	Where the weather/mature reflect the emotions of a character or the mood of a text.
Protagonist	The main character in a story.
Savagery	Acting in an uncivilised or primitive manner.
Semantic field	A group of words that link together to create a concept/idea.
Symbolism	Using a character or object to represent an important concept or idea.
Taboo	Something shocking and unacceptable to polite society.
Theme	An idea or concept that occurs regularly throughout a text.

ENGLISH - LORD OF THE FLIES

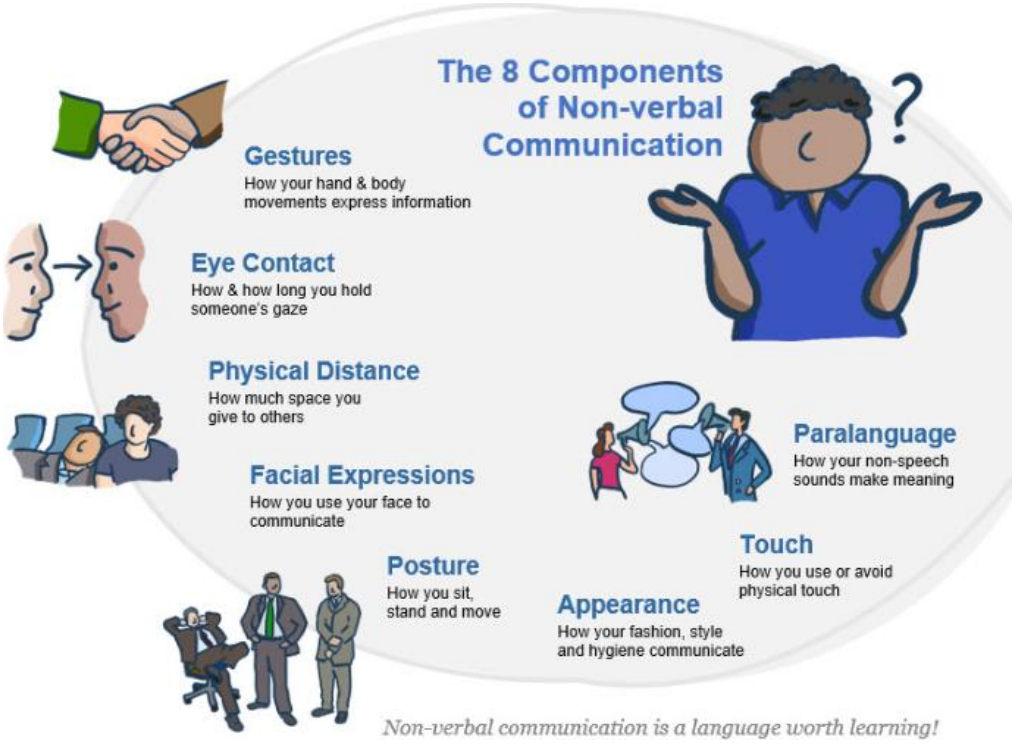
Key characters	
Ralph	The largest and most physically powerful. Wants to plan and follow rules, but even he is sometimes seduced by savagery. **Symbolises: law, government and civil society.**
Piggy	The smartest boy but has asthma and is fat so he is bullied. Has a tendency to lecture and is ridiculed. **Symbolises: science and rationality.**
Jack	Leader of the hunters. Loves to hunt and kill, gets angry when he does not get his own way. Believes a leader should be obeyed. **Symbolises: dominance, power and fear.**
Simon	A dreamy, dark haired boy prone to fits. He recognizes that the beast is within themselves. He is unafraid and he meditates. At one with nature. **Symbolises: religion and spirituality**.
Roger	A quiet and intense boy at first then becomes more and more evil. He tortures SamnEric and likes to inflict pain. **Symbolises: brutality.**

Key contextual information	
The Garden of Eden	God created man and placed him in paradise. Adam was given a companion (Eve). As Eve went against orders and ate from the Tree of Knowledge, God expelled Adam and Eve from the Garden of Eden.
WW2	1939-45. Global conflict. The Allies (UK, France and US) fought against Germany, Japan and Italy.
The Cold War (Soviet Bloc countries v Western Powers between 1945 – 1990)	A state of political hostility between countries characterised by threats, propaganda, and other measures short of open warfare.
William Golding	Golding had been in the military. During WW2, he was shocked at the crimes against humanity. He wrote LOTF after teaching at a boys' school. He wanted to imagine what would happen if authority was absent.
Social Class	A hierarchy separating individuals/groups according to education, wealth, social status and occupation. The class system tends to favour the wealthy, whilst oppressing the poor.

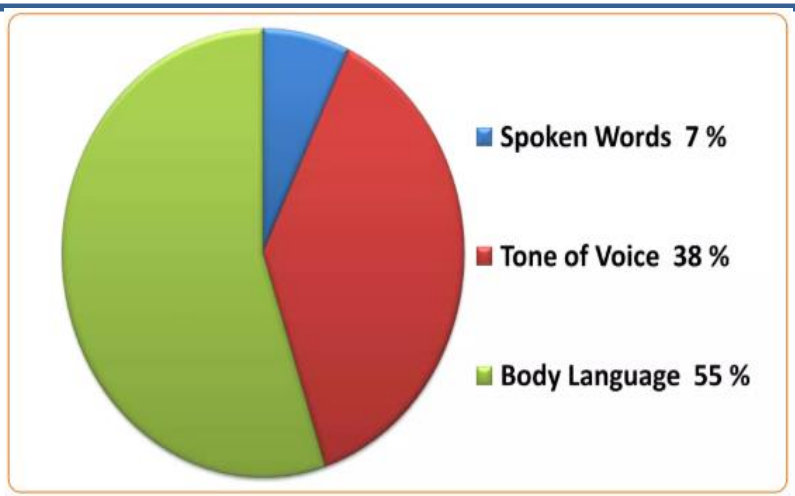
Themes in the text	
Human nature	Violence & death
Civilisation v Savagery	Survival
Loss of innocence	Power
Leadership	Fear & intimidation

Symbols in the text	
Piggy's Glasses	The Fire
The Beast	The Island
The Airman	The Conch
The Lord of the Flies	

Key Vocabulary	Definitions
Anecdote	A short, personal story to emphasise a point.
Pronouns (personal and collective)	Words that are used to address the audience directly and to encourage ideas of togetherness.
Emotive Language	Language used deliberately to gain an emotional response.
Fact	A true statement.
Opinion	Someone's personal beliefs or thoughts.
Repetition	Where something is repeated for impact.
Rhetorical Questions	A question asked by the speaker which does not require an answer. It helps to make the audience think.
Experts	Using a figure of authority/specialist who can support your idea/point.
Statistics	Numerical data that can be used to reinforce your point.
Triple	A group of three words, in a list, used to describe something.
SPIVS	Speed, Pitch, Intonation, Volume, Structure



Is how you say something important?



ENGLISH – CONFLICT POETRY

Language Methods	
Alliteration	The occurrence of the same sound at the beginning of adjacent or closely connected words.
Anaphora	Repetition of words, phrases or clauses.
Antithesis	A figure of speech that juxtaposes two contrasting or opposing ideas.
Colloquial language	Informal, casual language.
Emotive language	Language chosen to have an impact on your feelings.
Hyperbole	Exaggerated statements of claims.
Imagery	Descriptive or figurative language.
Metaphor	A comparison where something is presented as something else.
Oxymoron	A figure of speech where two contradictory ideas are intentionally paired in order to make a point.
Pathetic fallacy	Where the weather is used to mirror the emotions being experienced by a character in a text, or the mood of a text.
Personification	Where an inanimate object is given human characteristics.

Language Methods	
Plosive	Often sounding harsh, aggressive or shocking – harsh consonants such as b, d, k, p, t.
Rhetorical question	A question that does not require an answer (usually because the answer is about to be revealed or is obvious).
Semantic field	Groups of words with similar associations, connections or connotations.
Sibilance	A form of alliteration depending on the consonants that create a hissing sound e.g. c, s, z most commonly.
Simile	A comparison using the words 'like' or 'as'.
Tone	the way a writer / character /narrator speaks -which conveys their attitude toward their subject

Useful vocabulary	
Futile/futility	Infantry
Propaganda	Patriotic
Jingoism/Jingoistic	Trenches
Glorification	Verisimilitude
Fatigue	Morale

Poetic Forms – form means the physical structure of the poem (length of lines, their rhythms, their system of rhymes and repetition)	
Blank verse	Non-rhyming, lines of 10 syllables
Dramatic monologue	An imagined speaker addresses the reader
Elegy	About the death of its subject
Free verse	Non-rhyming, no regular rhythm.
Lyric	Emotional rhyming poem most often describing the emotions caused by a specific event.
Sonnet	14 line poem, usually about love of a person, object or situation.

Key concepts	
The glory and honour of war vs the reality of war.	The irrationality of war sacrifices made by men and families.
Conflict between humans and the natural world.	The long-term effects of war (PTSD, mental health, physical injuries etc)
The vulnerability of humans	The futility of war

Structural methods	
Caesura /s	Pause/s in a poem indicated by a form of punctuation, usually within lines. This helps to slow the pace, change the tone, or help it to focus on particular ideas.
Enjambment	Occurs when a phrase, clause, or sentence in a poem doesn't finish at the end of a line. Instead, it runs over into the next line.
End-stopped	A line of poetry that ends with some form of punctuation, such as a comma or full stop.
Refrain	A line or section of a poem that is repeated like a chorus. This helps to emphasise a particular idea.
Rhyme	Close similarity in the final sounds of two or more words or lines of writing.
Volta	The sudden turn of thought or change in tone. This is found in various types of poetry but common in sonnets.
Juxtaposition	When a writer places two things side by side in order to highlight their differences.
Stanza	A verse or section of a poem. These can be different lengths.

ENGLISH – UNSEEN TEXTS

Component 1 is worth 40% of your English Language GCSE

Section A

Reading: Fiction

- 1 piece of unseen prose.
- Between 60-100 lines of text.
- 5 questions, increasing in complexity.

20% - 40 marks

Section B

Writing

Narrative based on choice of 4 titles. 1 question covering AO5, communicate clearly and imaginatively and AO6 communicate with clarity, purpose and effect. Aim to write 3 sides of A4.

20% - 40 marks

Question 1: 5 marks – 5 mins

- Read the contextual information in the box above the extract.
- Read Q1. Rule off indicated lines.
- Read the lines. Highlight ideas related to the question. Ensure highlighted text is specific.
- Paraphrase the evidence you selected or embed evidence.
- Inference is *not* required-stick to the facts in the text.
- Write 5-7 bulleted answers.

Question 2: 5 marks – 10 mins

- Read Q2. Rule off indicated lines.
- Read the relevant lines thoroughly.
- As you read, track the text with pen.
- Select 3-5 quotations that answer the question.
- Ensure that quotes are selected chronologically.
- Write 3-5 Track-Quote-Comment paragraphs.

Question 3: 10 marks – 15 mins

- Read Q3.Identify the focus in the question. Highlight the focus.
- Highlight or "box out" the relevant lines. Then read thoroughly: track text with a pen and highlight relevant ideas related to the focus of the question.
- Select 7-10 quotations that answer the questions.
- Ensure that quotes are selected chronologically.
- Write 7 Track-Quote-Comment paragraphs as a minimum. You're aiming to write 10 of these analytical sentences in total.
- Inference is key here: be sure to offer insight into how your evidence is proof of the focus in the question and how it influences the reaction of the reader.

Answer structure

TRACK – your answers should follow the chronology of the text. State briefly where the ideas have come from and say a little about the focus of the question.

QUOTE – select the best evidence to answer the question and prove your ideas using direct evidence from the text.

COMMENT – make one, specific, insightful comment about each quote. Focus on the meanings and infer what the writer is telling is. This is where the mark is awarded.

Key vocabulary

Sequencing adverbials:

- At the start
- Next
- Later
- In the middle
- Further on
- Towards the end
- Finally

Analytical verbs:

- Implies
- Suggests
- Indicates
- Presents
- Shows
- Portrays
- Demonstrates

Question 4: 10 marks – 15 mins

- Read Q4.Identify and highlight the focus in the question.
- Highlight the relevant lines and follow the text with a pen, highlighting relevant ideas and evidence related to the focus of the question.
- Select 7-10 quotations that are related to the focus of the question.
- Read the section and identify quotes in chronological order.
- Write 7 Track-Quote-Comment paragraphs as a minimum. You're aiming to write 10 TQC paragraphs in total.
- Be sure to offer inference. Use analytical verbs to offer insight into why the author's choice of language relates to the focus in the question.

Question 5: 10 marks – 15 mins

- Read Q5 carefully. It differs from Q2-4 as it may ask you to refer to the end of the extract and the whole text OR the whole text.
- Identify and highlight the focus in the question.
- Highlight the relevant lines in the question and track the text with a pen, highlighting evidence related to the focus of the question.
- Select 7-10 quotations that you will be able to analyse to answer the focus.
- Ensure that your evidence is from the part of the text the question specifies.
- Write 7 Track-Quote-Comment paragraphs as a minimum. You're aiming to write 10 TQC paragraphs in total.

Mathematics - Straight Line Graphs, Forming Equations

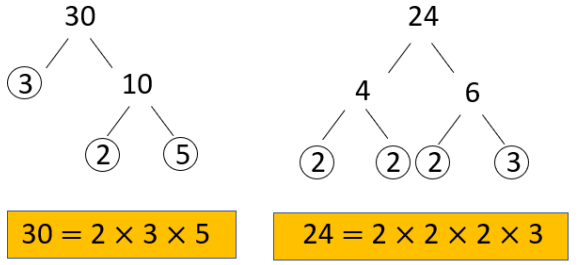
Key Vocabulary	Linear Graphs - Definitions
Straight line graph (SLG)	A line graph with no bend or kink. The equation of any SLG can be written in the form $y = mx + c$
Equation Linear Equation	A mathematical statement showing 2 expressions are equal. A linear equation $(y = mx + c)$ creates a SLG.
Horizontal Vertical Diagonal	Horizontal line - parallel to x-axis. Equation: $y = number$ Vertical line - parallel to y-axis. Equation: $x = number$ A sloping line. Equation: $y = mx + c$
$y = mx + c$	The equation of a SLG where "m" is the gradient of the line and c is the y-intercept
Graph	A diagram that shows the relationship between values
Co-ordinates	A pair of values (x, y) that gives the position of a point. An equation is the rule linking the x- and the y-coordinates
Parallel	Lines that remain the same distance apart and never meet. Equations with the same gradient will be parallel lines.
Perpendicular	Lines that meet at 90° (a right angle) Perpendicular lines have gradients that are negative reciprocals.
Negative Reciprocal	Numbers found by turning a fraction upside down and changing its sign. The product of a gradient and its negative reciprocal is -1. This proves lines are perpendicular.
Positive Gradient Negative Gradient	Read from left to right – the line slopes up Read from left to right – the line slopes down
y-intercept	Where a graph crosses the y-axis. The coordinate is (0,c)
Table of values	A table containing input and output values that can be written as coordinates and used to draw a graph.
Function	A rule that gives exactly one output (y) for each input (x) $y = mx + c$: $x\ coordinate \rightarrow \times m \rightarrow +c \rightarrow y\ coordinate$
Direct proportion graph	A SLG that passes through the origin such that one value (y, output) is a constant multiple of the other (x, input)

Key Vocabulary	Definitions
Unknown, Variable	Value that has not yet been found, often represented by a letter. A variable is a value that can change.
Equation Formula	A mathematical statement showing that two expressions have the same value. An equation may be solved if it has only one variable. A formula is an equation which includes more than one variable (and so cannot be solved without further information).
Inequality	A statement comparing values using symbols: $<$ less than; $\leq$ less than or equal to; $>$ greater than; $\geq$ greater than or equal to
Solve, solution	To find the value (solution) or values (solutions) that make the equation or inequality true.
Satisfy	To make or show a mathematical statement is true
Inverse, Inverse operations	An operation that reverses another operation e.g. add ↔ subtract; multiply ↔ divide; square ↔ square root
Coefficient	A number multiplying a variable; "$5x$" the coefficient is 5
Expand; Multiply out	To remove brackets by multiplying every term inside them. eg $2x(3x + 4) \equiv 6x^2 + 8x$ *or* $(x + 3)(x - 2) \equiv x^2 + x - 6$
Identity	Two expressions that are identical but written in different forms. In the above examples, the identity symbol, ≡ , indicates the two expressions are equivalent for every value of x
Balance	To keep both sides of an equation equal by performing the same operation on each side.
Substitute	To replace a letter with an known number or another expression
Form an equation	To write an equation using information given in a problem
Subject of an equation	The variable that is alone on one side of an equation or formula. For the formula $y = mx + c$, "y" is the subject.
Rearrange	Equations or formula may be re-written so a different variable is the subject. $y = mx + c$ *becomes* $x = \frac{y-c}{m}$

Mathematics - Testing Conjectures

Key Vocabulary	Definitions
Factor	A whole number that divides exactly into another number. Factors come in pairs, if one is known the other can be worked out.
Multiple	A number found by multiplying a given number by a whole number e.g. 70 is the 7th multiple of 10 (7 x 10 = 70)
Prime	A number greater than 1 with exactly two factors: 1 and itself. The first 10 prime numbers are: 2, 3, 5, 7, 11, 13, 17 ,19, 23, 29
Prime factors	The prime numbers that multiply together to make a number The prime factor decomposition of 70 is 2 x 5 x 7
Common	Shared by two or more numbers The only common factors of 10 and 15 are 1 and 5 The first 3 common multiples of 10 and 15 are 30, 60, 90, ...
Odd, Even	Even numbers are divisible by 2; Odd numbers are not. 2n represents an even number; 2n+1 represents an odd number.
Express	To write or represent something in a particular mathematical form. 70 expressed as the product of its prime factors is 2 x 5 x 7
Conjecture	A mathematical statement believed to be true after noticing a pattern but not yet proved.
Counter-example	Example that shows a conjecture or statement is not always true.
Demonstrate	To show clearly how or why something works.
Prove	To use a logical mathematical argument to show that a statement must always be true.
Expression	A mathematical phrase containing numbers, variables and operations but no equal sign.
Binomial	An algebraic expression containing two terms e.g. $25x + 6$
Factorise	To rewrite an expression as a product usually by putting factors outside a bracket. It is the reverse of expanding a bracket.
Simplify	To write an expression in an equivalent but shorter or clearer form.

All numbers can be written as the **product of prime factors.**



Conjecture: Prime numbers are always odd
Counter example: 2 is a prime number

Proof and algebra

Given: n is an integer

Therefore: $2n$ is an even number
(because 2 is a factor)

Therefore : $2n + 1$ is an odd number
(because any even number +1 is odd)

$(2n + 1)$ and $(2n + 3)$ are consecutive odd numbers

Proven: the sum of two consecutive numbers is always even as 2 is a factor:

$$2n + 1 + 2n + 3 = 4n + 4 = 2(2n + 2)$$

Mathematics - 3D Shapes, Constructions and Congruency

Key Vocabulary	3D Shapes - Definitions
Dimensions	Measurements describing size eg. length, width, height
Prism	A 3D shape with the same cross-section along all its length e.g triangular prism, cuboid, cylinder
Pyramid	A 3D shape has a polygon as its base and faces meeting at one point (vertex) e.g. cone, square based pyramid.
Face	A flat or curved surface of a 3D shape.
Edge	A line where two faces of a 3D shape meet
Vertex, Vertices	A corner where edges meet. 1 vertex, 2+ vertices.
Cross-section	The 2D shape seen when a 3D object is sliced straight through.
Constant cross-section	A cross-section that keeps the same shape and size throughout a solid.
Net	A flat 2D platter than can be folded to make a 3D shape
Plan	2D drawing of a 3D object as viewed from above - Bird's eye view.
Elevation	2D drawing showing a 3D object directly from the front or side.
Area	The amount of space inside a 2D shape measured in square units.
Surface Area	The total area of all outside faces or surfaces of a 3D shape
Volume	Amount of 3D space inside an object measured in cubic units.
Solid	A 3D shape that has length, width and height.
Polygon	A closed 2D shape created only from straight lines.
Perpendicular height	The shortest distance from a base of a shape to the opposite point or side measured at 90°.
Compound shape	A shape made by joining two or more simpler shapes.
Circumference	The distance all the way round a circle: $C = \pi d$ where d is the diameter (distance through the centre across the circle).

Key Vocabulary	Construction & Congruency – Definitions
Acute angle	An angle greater than 0° but less than 90°.
Obtuse angle	An angle greater than 90° but less than 180°.
Reflex angle	An angle greater than 180° but less than 360°.
Right angle	An angle of exactly 90°. The lines creating a 90° angle are perpendicular lines.
Protractor	A tool used to measure or draw angles.
Scale drawing	A drawing in which every length has been enlarged or reduced using the same scale.
Locus of a point	The path or set of all points that follow a given rule
Equidistant	The same distance from two or more points, lines or objects.
Construct	To draw a shape or angle accurately using geometric tools and rules.
Construction lines	Light working lines and arcs that show how a geometric construction was made.
Arc	Part of the circumference of a circle.
Perpendicular bisector	A line that cuts another line segment exactly in half at 90°.
Angle bisector	A line that divides an angle into two equal angles
Triangles	A 3 sided polygon. • Equilateral – triangle with 3 equal sides and 3 equal angles (60°) • Scalene – triangle with all sides and angles of different sizes • Isosceles – A triangle with two equal sides and two equal (base) angles. The equal angles are at the "base" of the 2 equal sides
Congruent	Exactly the same shape and side even if one shape has been turned (rotated), moved (translated) or flipped (reflected).
SSS, SAS, ASA, RHS	Side (S) and angle (A) properties to prove congruency in triangles

Mathematics - Number, Percentages, Money

Key Vocabulary	Working with Number - Definitions
Integer	A whole number that may be positive, negative or zero.
Rational number	A number that can be written as a fraction of two integers with a non-zero denominator.
Irrational number	A number that cannot be written as a fraction of two integers; its decimal representation does not terminate or recur.
Real number	Any number that can be represented on the number line, including rational and irrational numbers.
Surd	An irrational root written exactly, such as the square root of 2.
Directed number	A positive or negative number considered with its sign.
Highest common factor (HCF)	The greatest factor shared by two or more numbers.
Lowest common multiple (LCM)	The smallest positive number that is a multiple of two or more given numbers.
Fraction	A number that can represent part of a whole, a proportion or a division.
Numerator	The number above the fraction line.
Denominator	The number below the fraction line.
Reciprocal	The multiplicative inverse of a non-zero number; multiplying a number by its reciprocal gives 1.
Standard form	A way of writing a number as A x 10^n, where 1 <= A < 10 and n is an integer.

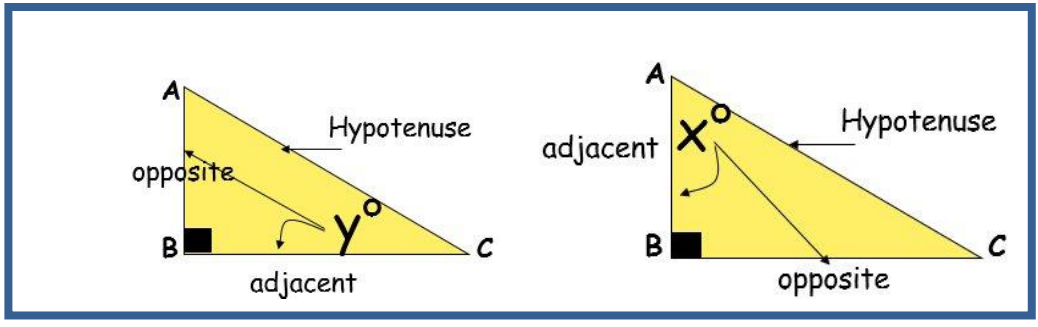
Key Vocabulary	Percentages - Definitions
Percentage	A proportion expressed as a number of parts per hundred.
Equivalent fractions	Fractions that have the same value even though they are written differently.
Percentage increase	An increase expressed as a percentage of the original amount.
Percentage decrease	A decrease expressed as a percentage of the original amount.
Percentage change	The change as a percentage of the original value.
Percentage multiplier	A multiplier used to increase or decrease an amount by a percentage.
Reverse percentage	Finding an original amount when a value after a percentage change is known.
Repeated percentage change	Applying a percentage multiplier successively to a quantity.
Growth	An increase in a quantity over time, often modelled using a multiplier.
Decay	A decrease in a quantity over time, often modelled using a multiplier.

Key Vocabulary	Money – Definitions
Bill	A statement showing money owed for goods or services.
Bank statement	A record of transactions and the balance of a bank account over a stated period.
Interest	Money added to savings or charged on borrowing, usually expressed as a percentage.

Mathematics - Money, Geometric Reasoning and Deduction

Key Vocabulary	Money continued - Definitions
Interest rate	The percentage used to calculate interest over a stated period.
Principal	The original amount of money saved, invested or borrowed.
Simple interest	Interest calculated only on the original amount for each time period.
Compound interest	Interest calculated on the original amount and on interest already added.
Balance	The amount of money in an account at a particular time.
Value Added Tax (VAT)	A tax added to the price of many goods and services.
Wage	Money paid for work, often based on hours worked or an agreed rate.
Tax	Money charged by a government on income, purchases or other transactions.
Exchange rate	A rate showing the value of one currency in terms of another.
Unit price	The cost for one unit of a product or quantity.
Best buy	The option that gives the greatest value for money after quantities have been compared on an equivalent basis.
Profit	The amount by which income from a transaction exceeds its costs.
Loss	The amount by which the costs of a transaction exceed its income.

Key Vocabulary	Geometry - Definitions
Alternate angles	Angles on opposite sides of a transversal; alternate interior angles are equal when the lines are parallel.
Co-interior angles	Interior angles on the same side of a transversal; when the lines are parallel, they sum to 180 degrees.
Vertically opposite angles	Opposite angles formed when two straight lines cross; they are equal.
Chain of reasoning	A sequence of connected logical steps used to reach a mathematical conclusion.
Deduction	A conclusion reached logically from known facts, definitions or previously established results.
Geometric proof	A logical argument that uses geometrical facts and reasoning to establish that a statement must be true.
Assumption	A statement accepted as true for the purpose of solving or modelling a problem.
Conclusion	A statement reached from evidence, calculation or logical reasoning.



Mathematics - Transformations and Similarity

Key Vocabulary	Transformations - Definitions
Transformation	A process that changes the position, size or orientation of a shape according to a rule.
Rotational symmetry	A property where a shape maps onto itself after a rotation of less than 360 degrees about its centre.
Order of rotational symmetry	The number of times a shape maps onto itself during a full turn of 360 degrees.
Line symmetry	A property where a shape can be reflected in a line so that it maps exactly onto itself.
Rotation	A transformation that turns a shape about a fixed point.
Centre of rotation	The fixed point about which a shape is rotated.
Angle of rotation	The size and direction of the turn in a rotation.
Translation	A transformation that moves every point the same distance in the same direction.
Vector	A quantity with both magnitude and direction, often used to describe a translation.
Column vector	A pair of numbers written vertically that describes horizontal and vertical movement.
Reflection	A transformation that maps each point to the opposite side of a mirror line at the same perpendicular distance.
Object	The original shape before a transformation.
Image	The resulting shape after a transformation.
Series of transformations	Two or more transformations applied one after another.

Key Vocabulary	Enlargement and Similarity - Definitions
Enlargement	A transformation that changes the size of a shape by a scale factor from a centre of enlargement.
Similarity	The property of shapes that have equal corresponding angles and proportional corresponding side lengths.
Scale factor	The multiplier connecting corresponding lengths in an enlargement or in similar shapes.
Centre of enlargement	The fixed point from which an enlargement is made.
Positive scale factor	A scale factor greater than zero.
Fractional scale factor	A non-integer scale factor written as a fraction or decimal.
Negative scale factor	A scale factor less than zero; in an enlargement the image lies on the opposite side of the centre of enlargement from the object.
Similar triangles	Triangles with equal corresponding angles and proportional corresponding side lengths.
Linear scale factor	The multiplier connecting corresponding lengths in similar shapes.
Area scale factor	The multiplier connecting corresponding areas of similar shapes; it is the square of the linear scale factor.
Volume scale factor	The multiplier connecting corresponding volumes of similar solids; it is the cube of the linear scale factor.

Mathematics - Pythagoras, Ratio & Proportion, Rates

Key Vocabulary	Pythagoras Definitions
Square number	A number that can be written as an integer multiplied by itself.
Square root	A number that, when multiplied by itself, gives the original number.
Right-angled triangle	A triangle containing one angle of 90 degrees.
Pythagoras theorem	In a right-angled triangle, the square of the hypotenuse equals the sum of the squares of the other two sides.
Hypotenuse	The side opposite the right angle in a right-angled triangle; it is the longest side.
Exact value	A value written without rounding, for example using a fraction, pi or a surd where appropriate.

Key Vocabulary	Ratio - Definitions
Ratio	A multiplicative comparison of two or more quantities.
Proportion	A relationship in which quantities are connected multiplicatively.
Direct proportion	A relationship in which two quantities change in the same ratio.
Conversion graph	A graph used to convert between two related measures or quantities.
Ratio problem	A problem involving quantities compared or shared in a given ratio.
Part-to-part ratio	A ratio comparing one part with another part.
Part-to-whole ratio	A ratio comparing one part with the total amount.

Key Vocabulary	Ration & Proportion – Definitions
Proportional reasoning	Using multiplicative relationships to compare quantities and solve proportion problems.
Unitary method	A method that first finds the value corresponding to one unit and then scales to the required amount.

Key Vocabulary	Rates – Definitions
Rate	A comparison of two quantities measured in different units.
Rate of change	How quickly one quantity changes in relation to another quantity.
Compound measure	A measure formed by combining two or more different units, such as speed or density.
Speed	Distance travelled per unit of time.
Distance-time graph	A graph showing how distance changes with time; its gradient represents speed.
Density	Mass per unit volume.
Mass	A measure of the amount of matter in an object, commonly measured in grams or kilograms.
Flow rate	The quantity of a substance passing a point per unit of time.
Compound unit	A unit formed by combining two or more different units, such as km/h or $kg/m^{3.}$
Average speed	Total distance travelled divided by total time taken.

Mathematics - Probability, Algebraic Representation

Key Vocabulary	Probability - Definitions
Probability	A numerical measure of how likely an event is to happen, from 0 to 1.
Outcome	A possible result of an experiment or trial.
Event	One or more outcomes of a probability experiment.
Single event probability	The probability that one specified event occurs.
Relative frequency	The number of times an outcome occurs divided by the total number of trials.
Convergence	The tendency of relative frequency to approach theoretical probability as the number of trials increases.
Expected frequency	The number of times an outcome is expected to occur, found by multiplying its probability by the number of trials.
Independent events	Events for which the occurrence of one does not change the probability of the other.
Dependent events	Events for which the occurrence of one changes the probability of the other.
Tree diagram	A branching diagram used to organise possible outcomes of successive events and their probabilities.
Without replacement	A situation where a selected item is not returned before the next selection, so probabilities may change.
Sample space diagram	A diagram or table showing all possible combined outcomes of an experiment.

Key Vocabulary	Probability - Definitions
Combined event	An event formed from two or more events considered together.
Product rule for counting	A counting rule stating that if one choice can be made in m ways and a second in n ways, the combined choices can be made in m x n ways.

Key Vocabulary	Quadratic - Definitions
Quadratic expression	An algebraic expression in which the highest power of the variable is 2.
Quadratic function	A function that can be written in the form ax^2 + bx + c, where a is not zero.
Quadratic graph	The graph of a quadratic function; its shape is a parabola.
Parabola	The U-shaped or inverted U-shaped curve formed by the graph of a quadratic function.
Reciprocal graph	A graph of a reciprocal relationship, for example y = 1/x.
Piecewise graph	A graph made from different rules or sections over different intervals.
Simultaneous equations	Two or more equations involving the same variables that must be satisfied at the same time.
Graphical solution	A solution found from the point or points where graphs meet or where a graph reaches a specified value.
Represent an inequality	To show the values satisfying an inequality using symbols, a number line, a graph or another suitable representation.

Science – B16 Adaptations, interdependence and competition

Key Vocabulary	Definitions
Ecosystem	The interaction of a **community** of living organisms with the non-living (**abiotic**) parts of their environment.
Biotic factors	Living components of an **ecosystem**. e.g. availability of food, new predators/pathogens/competitors.
Abiotic factors	Non-living factors that affect living organisms e.g. light intensity, temperature, moisture levels, soil pH, wind intensity and direction, CO_2 for plants, O_2 for aquatic animals.
Community	Organisms that interact with each other in an **ecosystem**.
Interdependence	The network of relationships between different organisms within a **community** e.g. each species depends on other species for food, shelter, pollination etc.
Adaptations	Features that enable organisms to survive in the conditions in which they normally live.
Quadrat	A sample area used for measuring the **abundance** and **distribution** of organisms in the field.
Abundance	A measure for how common or rare a particular type of organism is in a given environment.
Distribution	Where particular types of organisms are found within an environment.
Transect	A measured line or area along which ecological measurements are made.
Extremophiles	Organisms that live in environments that are very extreme e.g. high temperature, pressure or salt concentration e.g. bacteria living in dead sea vents are extremophiles.

Required practical: Measure the population size of a common species in a habitat



<u>Random sampling using quadrats:</u>
Sampling of the area you are studying must be random. It must show no bias – for instance, choosing to sample where there are lots of plants.

When you have chosen a sampling area, first divide it up into a grid for example using tape measures on each side.

Use a suitable method – you could draw numbers out of a hat – to generate a pair of random coordinates on your grid.

Place the first quadrat on your grid using these coordinates.

Count the number of different species within this quadrat (the species richness).

Repeat steps 1-4 so that you have a total of at least 10 counts.

<u>Use sampling techniques to investigate the effect of a factor on the distribution of species.</u>
Lay a tape measure along the transect (between two points).
At regular intervals use a quadrat to sample the organisms and measure any abiotic factors e.g. use a light meter.
Repeat steps 1 and 2 along a different transect between the two points

Science – C1 Atomic structure

Key Vocabulary	Definitions
Atom	The smallest part of an element that can exist. All substances are made of atoms. No overall electrical charge. Very small, radius of 0.1nm.
Element	An element contains only one type of atom. Found on the Periodic Table. There are 118 elements.
Compound	Two or more elements chemically bonded with each other. Can only be separated into the elements through chemical reactions.
Mixture	Contains two or more elements or compounds not chemically bonded. Can be separated using physical methods e.g. by filtration, crystallisation, distillation and chromatography.
Ion	Charged particles that are formed when atoms loose or gain electrons
Filtration	A process that separates mixtures of insoluble solids and liquids.
Crystallisation	A process that separates dissolved solids from liquids by evaporating the liquid to leave crystals.
Distillation	A process that separates a mixture of liquids based on their boiling points.
Chromatography	A process that separates mixtures by how quickly they move through a stationary phase (e.g. paper)
Isotope	An atom of the same element with different numbers of neutrons.
Relative atomic mass	An average value of mass that takes account of the abundance of the isotopes of the element.

Properties of Sub-Atomic Particles

Sub-atomic particle	Mass	Charge	Position in Atom
Proton	1	+1	Nucleus
Neutron	1	0	Nucleus
Electron	Very small	-1	Orbiting in shells

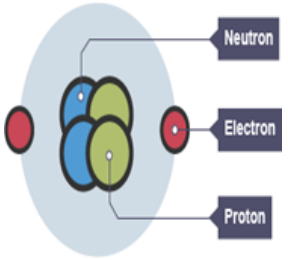
Development of Atomic Model

Plum Pudding



The plum pudding model shows that the atom is a ball of positive charge with negative electrons embedded in it. This was incorrect.

Nuclear Model



Rutherford's scattering experiment found a central area of positive charge.
The nuclear model has a positive nucleus and electrons in shells.

Chadwick later discovered neutrons.
Bohr discovered the arrangement of electrons in shells.

Calculating numbers of subatomic particles

The symbol for an atom shows its mass number at the top, and its atomic number at the bottom.
To calculate the numbers of subatomic particles in an atom, use its atomic number and mass number:

- number of protons = atomic number
- number of electrons = atomic number
- number of neutrons = mass number - atomic number

$^{23}_{11}Na$

PHYSICS P6 MOLECULES & MATTER

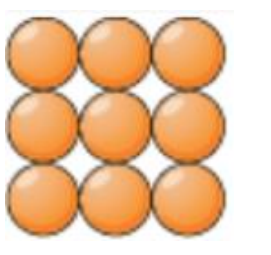
Key Vocabulary	Definitions
boiling point	temperature at which a pure substance boils or condenses
Boyle's law	for a fixed mass of gas at constant temp., *pressure x volume = constant*
density	mass per unit volume of a substance
internal energy	the total kinetic energy & potential energy of all particles (atoms and molecules) that make up a system
latent heat	the energy transferred to or from a substance when it changes state
melting point	temperature at which a pure substance melts or freezes (solidifies)
physical change	A change where a material will regain its original properties if the change is reversed e.g. water freezing
pressure	Pressure is caused by the force exerted by particles in a gas when they collide with the walls of a container
specific latent heat of fusion	Energy needed to melt 1kg of a substance with no change in temp.
specific latent heat of vaporisation	Energy needed to vaporise 1kg of a substance with no change in temp.

Equations:

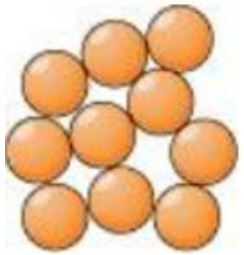
density = $\frac{\text{mass}}{\text{volume}}$ $\quad \rho = \frac{m}{V}$

energy for change of state = mass × specific latent heat $E = m L$

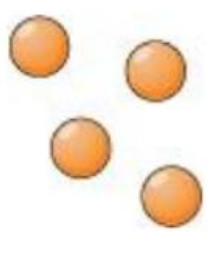
For gases: pressure × volume = constant $\quad p V = \text{constant}$



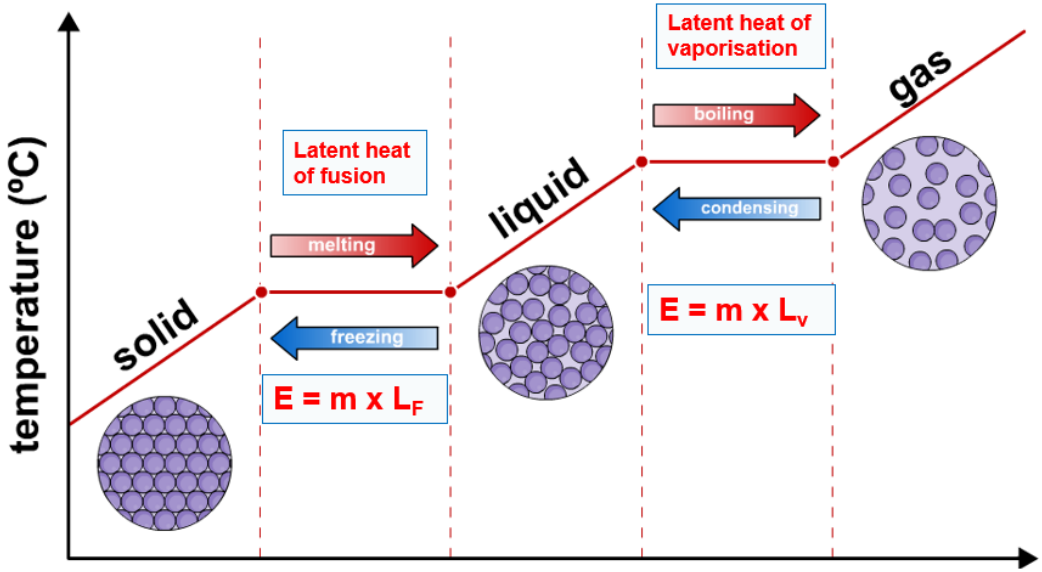
Solids
Have strong forces between the particles so keep their shape
Particles are tightly packed together so they cannot be compressed



Liquids
Particles can move so they flow and take the shape of the container
Particles are still tightly packed together so they cannot be compressed



Gases
Almost no force between particles so they can spread out and fill the space
Particles are far apart so they can easily be compressed



Key Vocabulary	Definitions
Atomic number	Number of protons in an atom.
Mass number	Number of protons plus neutrons in an atom.
Relative atomic mass	The average mass of atoms of an element taking into account the mass and amount of each isotope it contains. RAM = Total mass of atoms / total number of atoms
Ion	An electrically charged particle formed when an atom looses or gains electrons
Group	The name given to each column in the periodic table.
Element	A substance containing only one type of atom.
Period	The name given to a row in the periodic table.
Alkali metals	The elements in Group 1 of the periodic table.
Noble gases	The elements in Group 0 of the periodic table.
Halogens	The elements in Group 7 of the periodic table.
Transition element	Element from the central block of the periodic table
Diatomic Molecule	A molecule containing 2 atoms.
Halides	Compounds made from Group 7 elements.

All the different elements are arranged in a chart called the periodic table. A Russian scientist called Dmitri Mendeleev produced one of the first practical periodic tables in the 19th century. The modern periodic table is based closely on the ideas he used:

- the elements are arranged in order of increasing atomic number
- the horizontal rows are called periods
- the vertical columns are called groups
- elements in the same group are similar to each other

1	2											3	4	5	6	7	0
							1 H hydrogen 1										4 He helium 2
7 Li lithium 3	9 Be beryllium 4		Key: relative atomic mass; atomic symbol; name; atomic (proton) number									11 B boron 5	12 C carbon 6	14 N nitrogen 7	16 O oxygen 8	19 F fluorine 9	20 Ne neon 10
23 Na sodium 11	24 Mg magnesium 12											27 Al aluminium 13	28 Si silicon 14	31 P phosphorus 15	32 S sulfur 16	35.5 Cl chlorine 17	40 Ar argon 18
39 K potassium 19	40 Ca calcium 20	45 Sc scandium 21	48 Ti titanium 22	51 V vanadium 23	52 Cr chromium 24	55 Mn manganese 25	56 Fe iron 26	59 Co cobalt 27	59 Ni nickel 28	63.5 Cu copper 29	65 Zn zinc 30	70 Ga gallium 31	73 Ge germanium 32	75 As arsenic 33	79 Se selenium 34	80 Br bromine 35	84 Kr krypton 36
85 Rb rubidium 37	88 Sr strontium 38	89 Y yttrium 39	91 Zr zirconium 40	93 Nb niobium 41	96 Mo molybdenum 42	[98] Tc technetium 43	101 Ru ruthenium 44	103 Rh rhodium 45	106 Pd palladium 46	108 Ag silver 47	112 Cd cadmium 48	115 In indium 49	119 Sn tin 50	122 Sb antimony 51	128 Te tellurium 52	127 I iodine 53	131 Xe xenon 54
133 Cs caesium 55	137 Ba barium 56	139 La* lanthanum 57	178 Hf hafnium 72	181 Ta tantalum 73	184 W tungsten 74	186 Re rhenium 75	190 Os osmium 76	192 Ir iridium 77	195 Pt platinum 78	197 Au gold 79	201 Hg mercury 80	204 Tl thallium 81	207 Pb lead 82	209 Bi bismuth 83	[209] Po polonium 84	[210] At astatine 85	[222] Rn radon 86
[223] Fr francium 87	[226] Ra radium 88	[227] Ac* actinium 89	[261] Rf rutherfordium 104	[262] Db dubnium 105	[266] Sg seaborgium 106	[264] Bh bohrium 107	[277] Hs hassium 108	[268] Mt meitnerium 109	[271] Ds darmstadtium 110	[272] Rg roentgenium 111	[285] Cn copernicium 112	[286] Uut ununtrium 113	[289] Fl flerovium 114	[289] Uup ununpentium 115	[293] Lv livermorium 116	[294] Uus ununseptium 117	[294] Uuo ununoctium 118

* The Lanthanides (atomic numbers 58 – 71) and the Actinides (atomic numbers 90 – 103) have been omitted.

Relative atomic masses for **Cu** and **Cl** have not been rounded to the nearest whole number.

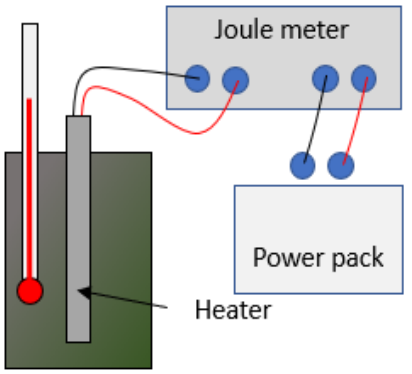
PHYSICS P2 ENERGY TRANSFER BY HEATING

Key Vocabulary	Definitions
Absorption	Taking in (absorbing) radiation.
Blackbody	A body that absorbs all the radiation that hits it
Conduction	The transfer of thermal energy by particles colliding with each other. Metals are good conductors,
Convection	Circulation of a liquid or gas caused by increasing its thermal energy and changing its density
Emission	Giving out (emitting) radiation
Infrared Radiation	Electromagnetic waves between visible light and microwaves in the electromagnetic spectrum
Insulator	Insulators are poor conductors, they often use trapped air in foam, wool or fur. Air is a very poor conductor
Specific heat capacity	The energy needed to raise the temperature of 1kg of a substance by 1°C
Specific latent heat	The energy needed to change the state of 1kg of a substance
Thermal conductivity	The property that determines the energy transferred through a material by conduction
Thermal insulation	Methods we use to reduce the rate of energy transfer from houses e.g. loft insulation, double glazing

Specific Heat Capacity Required Practical

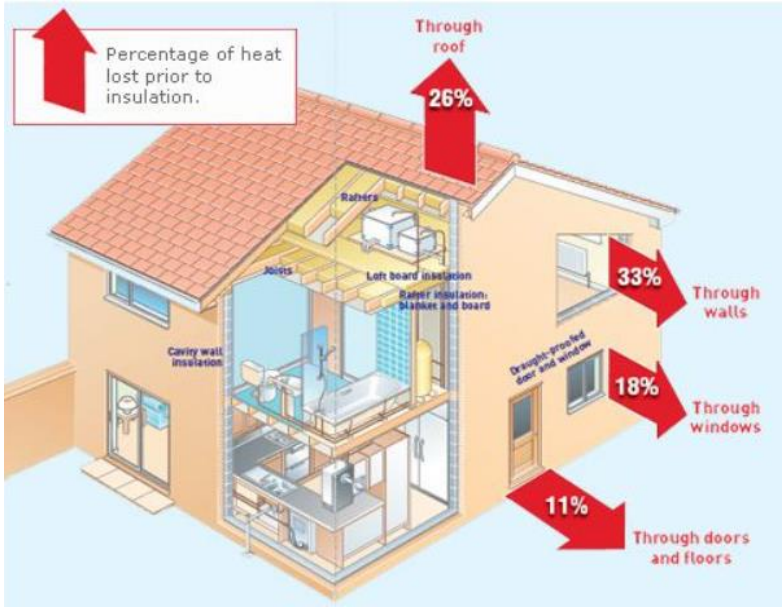
Energy = mass x specific heat capacity x temperature change

$$\Delta E = mc\Delta\theta$$



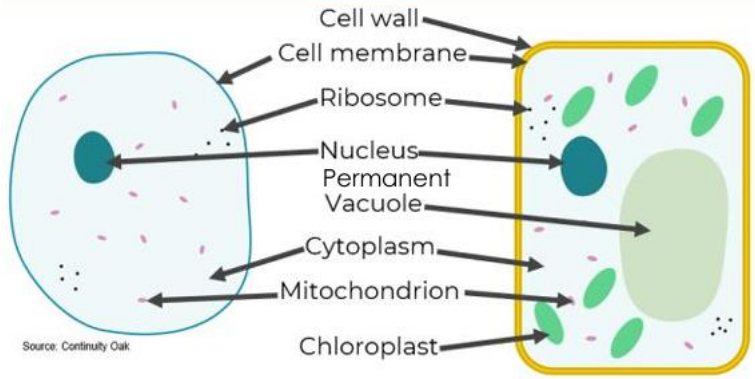
To find the specific heat capacity of a material, use a heater to heat up a 1kg block and record the **temperature change** and **energy transferred.**

Use the **change in energy and the change in temperature to** calculate the specific heat capacity

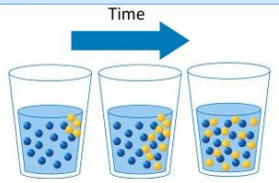
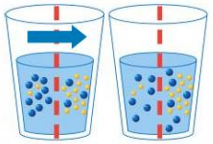
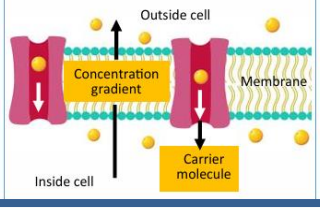


Science - B1 Cellular Biology

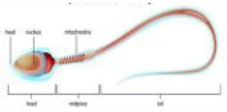
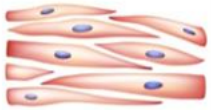
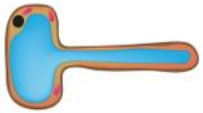
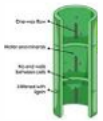
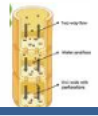
Key Vocabulary	Definitions
Cell	The building blocks for all living organisms.
Tissue	Group of similar cells working together for a particular function.
Cell Membrane	Controls what enters and leaves the cell
Cytoplasm	Jelly like substance where most chemical reactions occur
Mitochondria	Where aerobic respiration takes place
Nucleus	Contains DNA, controls activities of cell
Ribosome	Where proteins are made
Cell Wall	Made of cellulose strengthens and supports the cell
Chloroplast	Where photosynthesis occurs
Permanent Vacuole	Contains cell sap, plant store of starch



Transport across membranes

Process	Definition	Image	Uses
Diffusion	The net movement of particles from an area of higher concentration to an area of lower concentration. Occurs in solutions and gases.		Movement of oxygen and carbon dioxide in gas exchange (lungs - alveoli; leaves – spongy mesophyll and stomata), and of the waste product urea from cells into the blood plasma for excretion in the kidney.
Osmosis	The diffusion of water from a dilute to concentrated solution, across a partially permeable membrane (shown in red).		Movement of water across cell membranes into and out of cells.
Active Transport	The movement of particles from a low concentration to a high concentration, using energy from respiration.		Absorption of mineral ions into plant root hairs from very dilute solutions in the soil. Absorption of sugar molecules from lower concentrations in the gut into the blood which has a higher sugar concentration.

Specialised cells

Specialised cell	Image	How the structure relates to the function
Nerve cell		Elongated axon to transmit electrical impulses over a distance; large dendrites; fatty sheath covering the axon for insulation, to speed up transmission
Sperm cell		Has a long tail to allow it to swim; contains many mitochondria to release lots of energy; streamlined head containing enzymes
Muscle cell		Lots of mitochondria to release energy for muscle contraction; elastic fibres to allow the muscle to contract and relax
Root hair cell		Has a large surface area and thin cell wall for water and mineral absorption
Xylem cell		Strengthened walls by lignin for the transport of water and dissolved ions
Phloem cell		Sieve plates to allow the transport of dissolved sugars

Key Vocabulary	Definitions
Acid	An acid has a pH value of less than 7.
Alkali	Its solution has a pH value more than 7.
Base	A soluble alkali that forms a salt when it reacts with an acid.
Strong Acid	An acid that completely dissociated into ions in solution, e.g. nitric acid.
Weak Acid	An acid that is only partly dissociated in solution, e.g. ethanoic acid.
pH Scale	A scale to tell us how acidic or alkaline an aqueous solution is.
Displacement reaction	When a more reactive metal replaces a less reactive metal in a compound.
Electrolysis	The breakdown of a substance using electricity.
Oxidation	Gain of oxygen or loss of electrons.
Reduction	Loss of oxygen or gain of electrons.
Neutralisation	The reaction of an acid with a base producing salt and water.
Indicator	A substance that changes colour when added to acids or alkalis.
Salts	A compound formed when some of the H^+ in an acid is replaced by a metal.
Soluble	Dissolves in water.
Insoluble	Does not dissolve in water.
Ore	Rock which contains enough metal to make it economically worth extracting.

Making Salts

Acid + metal → salt + hydrogen
Acid + base → salt + water
Acid + alkali → salt + water
Acid + metal carbonate → salt + water + carbon dioxide

The Reactivity Series and Extraction



sodium
calcium
magnesium
aluminium

Metals above carbon in the reactivity series must be extracted using electrolysis.

(carbon)

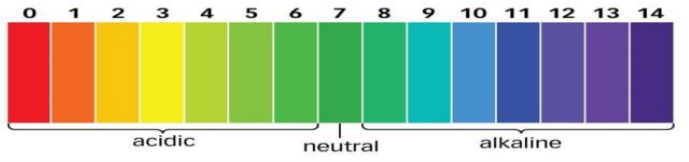
zinc
iron
lead

Metals less reactive than carbon can be extracted from their ores by reduction.

(hydrogen)

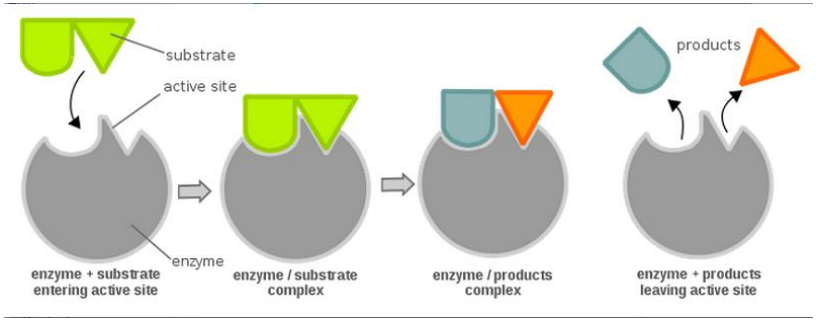
copper
silver
gold
platinum

Copper, silver, gold and platinum can occur native and do not need to be extracted. Sometimes copper needs to be extracted from an ore.



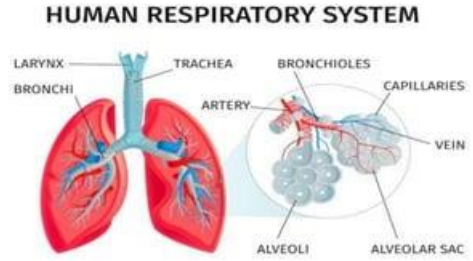
Biology – B3 Organisation of living organisms

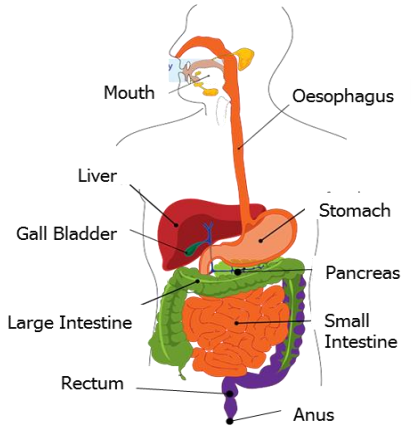
Key Vocabulary	Definitions
Active site	The part of the enzyme that helps break down the substrate
Bile	Alkaline substance produced in the liver and stored in the gall bladder. It neutralises stomach acid and breaks down fats into small droplets
Catalyst	A molecule/chemical that speeds up the rate of reaction
Denatured	When the active site of an enzyme changes shape and the substrate can no longer fit in. Can be caused by pH or temperature
Emulsification	Mixing two liquids such as oil and water that would not normally mix
Enzyme	Protein with an active site of a specific shape which speeds up reactions
Lock and key mechanism	Only one type of substrate can fit into the active site of an enzyme, like a key fits into a lock.
pH	How acidic or alkaline a substance is. Enzymes are very sensitive to pH.
Substrate	The specific molecule that binds to an enzyme's active site
Villi	Finger like projections in the small intestine that increase surface area, helping with absorption



Molecule	What is it made from?	Chemical Test	Positive results looks like
Sugar	Carbohydrates with one or two sugar units	Benedict's reagent and heat	Small amount = green Large amount = brick red
Starch	Complex carbohydrate made from long chain of glucose	Iodine	Turns black
Protein	Long chains of amino acids	Biuret reagent	Turns purple
Lipid / Fat	3 fatty acids bonded to a glycerol molecule	Ethanol Sudan III	Cloudy emulsion Red top layer

Digestive Enzyme	Produced	Site of Action	Substrate	Product
Carbohydrase Amylase	Salivary glands, pancreas, small intestine	Mouth and small intestine	Carbohydrates Starch	Simple sugars Glucose
Protease Pepsin	Stomach, pancreas, small intestine	Stomach	Proteins	Amino acids
Lipase	Pancreas, small intestine	Small intestine	Lipids	Glycerol and fatty acids



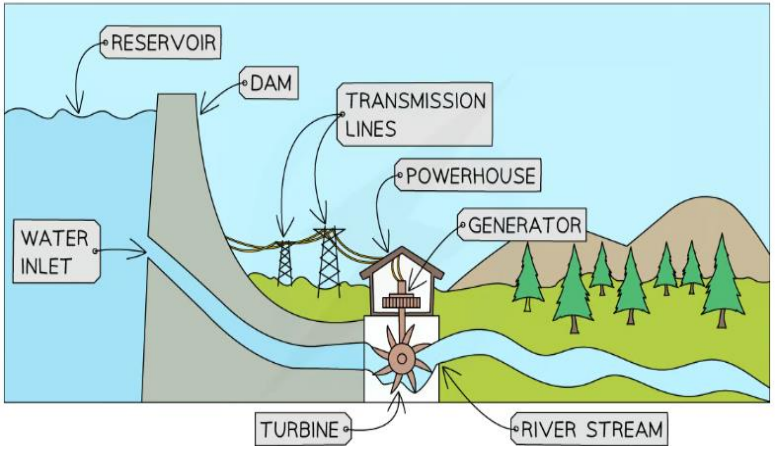


Science P3 - Energy resources

Key Vocabulary	Definitions
Biofuel	A fuel taken from living or recently living material e.g. plants or animal waste
Carbon neutral	A biofuel that absorbs as much CO_2 from the atmosphere as it emits when it is burnt
Energy resources	The resources we use for transport, generating electricity and heating. They include coal, oil, gas, wind, solar, tides, biofuel, the Sun and nuclear.
Fossil fuel	A fuel formed from the remains of living organisms millions of years ago. Coal, oil and gas
Geothermal energy	Energy that is released by radioactive substances deep beneath the Earth's surface
National Grid	The network of cables and transformers that transmits power around the country
Non-renewable energy	An energy source that is finite e.g. coal, oil, gas & nuclear. It is being used at a greater rate than it can be replenished
Nuclear fuel	Substance used in a nuclear reactor to release energy through fission e.g. uranium & plutonium
Reliable	An energy source that produces a continuous and predictable supply of power
Renewable energy	An energy source that can be replenished as it is used

Energy source	Advantages	Disadvantages
Fossil fuels	Reliable, readily available	Produce greenhouse gases, non-renewable
Nuclear fuel	Reliable, does not produce CO_2	Produces dangerous radioactive waste, non-renewable
Wind	Renewable, does not produce CO_2	Expensive to set up, unreliable, visual pollution,
Hydroelectricity	Renewable, does not produce CO_2	Not all areas suitable, set up damages environment
Solar	Does not produce CO_2, can be used in remote locations	Expensive to set up, unreliable
Geothermal	Renewable, does not produce CO_2	Few areas are suitable, expensive to drill so deep
Biofuel	Carbon neutral, reliable, renewable	Can take up a lot of land
Tidal	Renewable, reliable, does not produce CO_2	Expensive to build, disturbs habitats of wading birds
Water waves	Renewable, does not produce CO_2	Dilute source, expensive to set up, unreliable

Electricity is generated in a power station by turning a turbine. The turbine is made to turn by the steam from water heated by fuels (fossil or nuclear) or the turbine is turned directly by flowing water or the wind.



COMPUTER SCIENCE - 1. COMPUTER CRIME & CYBER SECURITY & 2. AI & MACHINE LEARNING

1. COMPUTER CRIME & CYBER SECURITY

Phishing	A **fraudulent attempt**, typically made through **email**, to steal **personal information** by **masquerading** as a **trustworthy entity**.
Hacking	The act of **gaining unauthorised access** to computer systems for the purpose of **stealing** and **corrupting data**.
Malware	**Malicious software** designed to **infiltrate**, **damage**, or **disrupt** computer systems without the user's **informed consent**.
Virus	A **type** of **malware** that **attaches itself** to a **legitimate program** and **replicates** when the program is **executed**, often causing **harm** to the system.
Trojan	A malicious program that **disguises itself** as **legitimate software** but, when **executed**, grants **unauthorised access** or causes **damage** to the system.
Logic Bomb	**Malicious code** inserted into a software system that triggers a **harmful action** when **certain conditions** are met.
Geo-tagging	The process of adding **geographical identification metadata** to various **media**, such as **photos** or **videos**
Data Harvesting	The process of collecting **large sets** of **data** from various **sources**, often without the **consent** of the **individuals** involved.
Cybercrime	**Criminal activities** carried out using **computers** or the **internet**, including **fraud**, **identity theft**, and **unauthorised access** to computer **systems**.
RSI (Repetitive Strain Injury)	A **condition** resulting from **repetitive movements** or **overuse** of **certain muscles**, often affecting **individuals** who spend **prolonged periods** using **computers** without proper **ergonomics**.
Copyright	A **legal right** granted to the **creator** of **original works**, such as **literary**, **artistic**, or **software** creations, providing exclusive **rights** to **use** and **distribute** the work.
E-waste	**Discarded electronic appliances** such as **mobile phones**, **computers**, and **televisions**, which can pose **environmental** hazards if not **disposed** of **properly**.

2. AI & MACHINE LEARNING

Facial Recognition	A **biometric technology** that identifies **individuals** by **analysing** and **comparing facial features** from **images** or **video**.
Fingerprint Recognition	A **biometric method** of **identifying** individuals by analysing the unique **patterns** of their **fingerprints**.
Language Processing	The **computational techniques** involved in **analysing** and **synthesising natural language**, enabling **interactions** between **computers** and **human** languages.
Neural Network	A **computational model** inspired by the **human brain's** interconnected **neuron structure**, used in machine learning to recognise **patterns** & **solve** complex **problems**.
Self-Driving Cars	**Vehicles** equipped with **technology** that allows them to **navigate** and **operate** without **human** intervention by **sensing** their **environment** and **making decisions**.
Sensors	Devices that **detect** and **respond** to **physical inputs** from the **environment**, such as **light**, **temperature**, **motion**, or **pressure**, and convert them into **signals** for **measurement** or **control**.
Embedded	Refers to **computer systems integrated** into other **devices** to perform specific **functions**, often with **real-time** computing **constraints**.
Camera	An **optical** device that **captures images** or **video**, either as a **standalone device** or as part of **another system**.
Push Button	A **simple switch** mechanism for **controlling** some aspect of a **machine** or **process**, activated by **pressing**.
Rules	Defined **guidelines** or **instructions** that **dictate** the **behaviour** of a **system** or **process**, often used in **programming** and **decision-making** algorithms.
Decisions	**Choices** made by a **system** or **algorithm** based on **predefined rules** or **learned patterns** to achieve a **specific outcome**.
Training Data	A **dataset** used to **teach machine learning models** to recognise **patterns** or make **decisions**; the **quality** and **diversity** of this **data** significantly impact the **model's performance**.

COMPUTER SCIENCE - 2. AI & MACHINE LEARNING & 3. PYTHON NEXT STEPS

2. AI & MACHINE LEARNING (CONTD.)

Machine Learning	A **subset** of **artificial intelligence** where systems **learn** from **data** to **improve** their **performance** over **time** without being **explicitly programmed**.
Structured Data	Information **organised** in a **predefined manner**, often in **tabular formats** like **databases** or **spreadsheets**, making it easy to **search** and **analyse**.
Utilitarianism	An **ethical theory** that posits the **best action** is the **one** that **maximizes overall happiness** or **utility**.
Morals	**Beliefs** about what is **right** and **wrong behaviour**, often shaped by **cultural**, **religious**, or **personal** values.
Bias	A tendency to **favour** or **lean** towards a particular **perspective**, **outcome**, or **result**, which can lead to **unfairness** in **decision-making processes**, including in **algorithms** and **data analysis**.
Fuzzy Logic	A form of **logic** used in **computing** and **mathematics** that allows for **reasoning** with **degrees** of **truth** or **uncertainty**, rather than the **traditional true/false binary**.
Intelligence	The ability to **acquire** and **apply knowledge** and **skills**, including **reasoning**, **problem-solving**, and **understanding** complex **ideas**.
IQ (Intelligence Quotient)	A measure of a person's **intellectual abilities** relative to others, typically **assessed** through **standardised testing**.
Turing Test	A **test** proposed by **Alan Turing** to determine a machine's **ability** to exhibit **intelligent behaviour indistinguishable from** that of a **human**.
Captcha	**Completely Automated Public Turing** test to tell **Computers** and **Humans Apart**; a type of **challenge-response** test used to **determine** whether the **user** is **human**, commonly **employed** to **prevent** automated **bots** from **accessing websites**.
Chatbots	**Computer programs** designed to simulate **conversation** with **human users**, especially over the **internet**, using predefined **rules** or **artificial intelligence**.

2. AI & MACHINE LEARNING (CONTD.)

Virtual Assistants	Software **agents** that can **perform tasks** or **services** for an individual based on **commands** or **questions**, utilising **natural language processing** and **machine learning**, such as **Siri** or **Alexa**.
Sentiment Analysis	The process of **computationally identifying** and **categorising opinions** expressed in **text** to **determine** the writer's **attitude** toward a particular **topic**, **product**, etc.
Weightings	Values **assigned** to **variables** or **inputs** in **algorithms** or **models** to signify their **relative importance** or **influence** on the **outcome**.

3. PYTHON NEXT STEPS

Integrated Development Environment (IDE)	A **software application** that provides **comprehensive facilities** to computer **programmers** for **software development**, including a **code editor**, **debugger**, and **build automation** tools.
IDLE (Integrated Development and Learning Environment)	A **simple integrated development environment** for **Python**, designed to be **easy** to **use** and **suitable** for **beginners**.
Variable	A **storage location identified** by a **name** that can hold **data** which may be **modified** during program **execution**.
String	A **sequence** of **characters**, typically used to represent **text** in programming.
Assignment Statement	A **statement** in programming that **assigns** a **value** to a **variable**.
Data Type	An **attribute** of **data** that tells the **compiler** or **interpreter** how the **programmer** intends to **use** the **data**, such as **integer**, **float**, or **string**.
Casting	The process of **converting** a **variable** from one **data type** to **another**.

3. PYTHON NEXT STEPS (CONTD.)

Integer	A **whole number** that can be **positive**, **negative**, or **zero**, without any **fractional part**.
Float	A **data type** that represents **numbers** with **fractional parts**, using **floating-point representation**.
Round	A **function** that **approximates** a **number** to its nearest **integer** or to a **specified number** of **decimal places**.
Selection	A **programming construct** that uses **conditional statements** to **execute** different **code paths** based on whether a **condition** is **true** or **false**.
Iteration	The **repetition** of a **block** of **statements** in a computer program for a defined **number** of **times** or until a **condition** is **met**.
Loop	A sequence of **instructions** that **repeats** until a **certain** condition is **met**; a fundamental **concept** in **iteration**.
Syntax Error	An **error** in the **source code** that **violates** the **grammatical rules** of the programming **language**, preventing the program from **compiling** or **running**.
Logic Error	An **error** in a **program** that causes it to **operate incorrectly** but not to **terminate abnormally** (or **crash**).
Debug	The process of **identifying** and **removing errors** from computer **hardware** or **software**.
List	An **ordered** collection of **elements**, which can be of various **data types**, accessible by their position (index) in the sequence.
Array	A **data structure** consisting of a **collection** of **elements**, each identified by an array index or key, typically of the **same** data type.
Index	An **integer value** that indicates the **position** of an **element** within an **array** or **list**.
Procedure	A set of **coded instructions** that perform a **specific task** and can be called within a **program**; also known as a **subroutine**.
Function	A **block** of **organised**, **reusable code** that performs a single **action** and can **return** a **value** to the **caller**.
Call	The **act** of **invoking** a **procedure** or **function** in a **program**.

5. INTRODUCTION TO PYTHON (CONTD.)

Argument	A **value** that is **passed** to a **function** or **procedure** when it is **called**.
Parameter	A **variable** in the **declaration** of a **function** or **procedure** that **accepts** the **value** of an **argument**.
Return Value	The **value** that a **function** or **procedure returns** to the **caller** after **execution**.
Modular Program	A **software design technique** that emphasises separating the **functionality** of a **program** into **independent**, interchangeable **modules**.
Dry Run	The **process** of **manually working through** an **algorithm** or **program** with **test data**, without using a **computer**, to **verify** its **correctness**.

4. ALGORITHMS

Algorithm	A **finite** set of **step-by-step instructions** designed to perform a **specific task** or **solve** a **problem efficiently**.
Sorting Algorithm	A method for **arranging data** in a **specific order**, such as **ascending** or **descending** order. Examples include **Bubble Sort**, **Merge Sort**, and **Quick Sort**.
Bubble Sort	A **simple sorting algorithm** that repeatedly **swaps adjacent elements** if they are in the **wrong order**, **moving** the **largest values** to the **end**, like **bubbles** rising to the **surface**.
Merge Sort	A **divide-and-conquer sorting algorithm** that **splits** a **dataset** into **smaller parts**, **sorts** them, and then **merges** them back into a **fully sorted** sequence.
Brute Force Algorithm	A **method** that tries **every possible solution** to **solve** a **problem**, often **inefficient** but **guaranteed** to **work** if **enough time** is given.
Travelling Salesman Problem	A **famous computational problem** that seeks the **shortest possible route** to visit a **set** of **locations** once and **return** to the **start**.
Matching Algorithm	A type of **algorithm** used to **pair individuals** or **elements** based on given **criteria**, such as **dating apps**, **job matching**, and **organ donor** pairings.

History – Causes of World War One

Causes of World War One	
Militarism	The building-up of armies and navies, fuelling capacity for war
Alliances	· Pacts made by countries to support each other if war broke out · Designed to deter a war from starting
Triple Alliance	· Germany, Austria Hungary & Italy · They were encircled by the Triple Entente
Triple Entente	Great Britain, France & Russia
Arms Race	European countries prioritising military spending to build up their armies
Naval Race	· Britain had a large navy to protect its empire · Kaiser Wilhelm wanted to create a strong German navy · British launched the Dreadnought (new battleship) in 1906
Schlieffen Plan	· Germany felt threatened by France & Russia · They created a plan in 1905 to attack and defeat France before turning to deal with Russia
Imperialism	Desire to build an empire, led to growing tension between European Powers
'Scramble for Africa'	Invasion and colonising of Africa by of European power, further fuelling tension.
Nationalism	Belief in the superiority of your country
The Black Hand	A terrorist organisation set up by Serbian army officers. Provided weapons and training for Gavrilo Princip or assassinated Archduke Franz Ferdinand, heir to the Austro-Hungarian throne

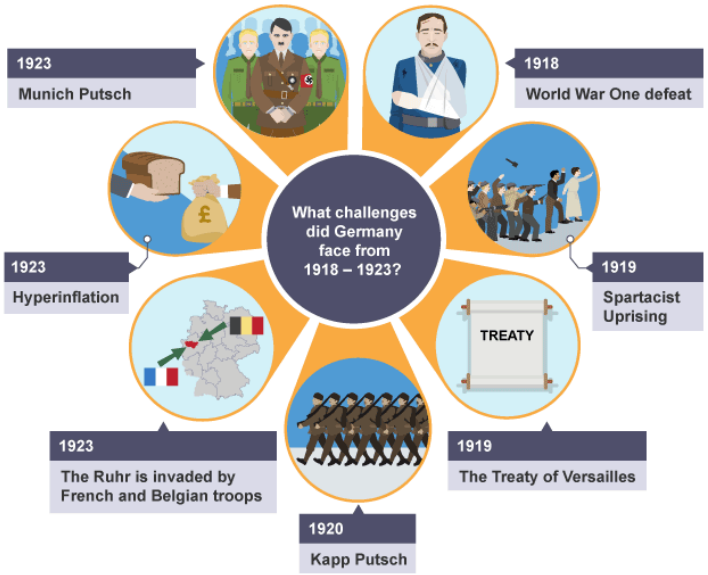
Key Vocabulary	
The BEF	The British Expeditionary Force, Britain's army in 1914
Conscription	Compulsory order for all men 18 to 41 to join the army
Stalemate	A deadlock where no side is able to make progress to win.
No Mans Land	Area separating opposing armies in trench warfare.
Mustard Gas	Poisonous gas used by the Germans, French and British
Artillery	Large guns that fire explosive shells over long distances
Trench Foot	A painful condition of the feet caused by long exposure in cold water or mud, as a result some feet were amputated.
Trench Fever	A disease caused by lice bites which made soldiers very ill in the trenches.
Dugout	Shelter dug into the side of the Trench
Armistice	An agreement made by tin a war to stop fighting.
War effort	How people at war and at home contribute to the war.
Conscientious Objector	Someone who refuses to fight or be involved in war for religious, moral or political reasons, also called 'Conchies'
Munitions	Military weapons and ammunition
David Lloyd George	Prime Minster of Britain during and after WW1
Trench Warfare	Nature of fighting where both sides build deep trenches as a defence against the enemy. These trenches can stretch for many miles and make it nearly impossible for one side to advance.
Western Front	The area of fighting in western Europe in the First World War. A majority of fighting was done in North–Eastern France and Belgium in trenches
War of Attrition	A war based on winning by wearing down the enemies armies, economy and morale.

1882 Triple Alliance Formed	**1907** Triple Entente Formed	**28 Jun 1914** Franz Ferdinand assassinated	**5 July** Germany's offer of unconditional support, the 'Blank Cheque' is sent to A-H	**Jul 1914** Serbia reject ultimatum from Austria-Hungary	**1 August** Germany declares war on Russia	**3 August** Germany declares war on France	**4 August** Britain declares war

History – End of the First World War and the Peace Treaties

Overview of key events of the First World War
8th August 1914 Britain passes DORA (the Defence of the Realm Act) which gives the government powers such as to ration food, control the news and use factories.
April 1915 – Poison gas is used for the first time at the Second Battle of Ypres
February 1916 - The Battle of Verdun begins between France and Germany. This battle will last until December 1916 and will finally result in a French victory.
July 1916 – Battle of the Somme, the largest battle of the war.
Sept 1916 – The ever first tank is used in the Battle of the Somme
January 1917 – Conscription introduced in Britain
31st July – 10th November 1917 – The Battle of Passchendaele.
20th November – 7th December 1917 – The Battle of Cambrai, first large scale use of tanks in battle.
February 1918 – Representation of the People Act, this gives the first time vote to men over 21 and women over 30
21st March – 18th July 1917 – German Spring Offensive, Germans make the largest territorial gains in the war since 1914.
11th November 1918 – An armistice is signed, Germany surrenders and WW1 ends

Impact and Terms of the Peace Treaty	
Armistice	Ceasefire signifying the end of WW1
Treaty of Versailles	Peace treaty that Germany was forced to sign in 1919
Terms of Versailles Treaty	• **Territory** – Germany lost 13% of its land, including all overseas territory. Alsace-Lorraine returned to France • **Reparations**: Germany had to pay compensation to the Allies ($6.6 billion) • **Armaments**: Army limited to 100,000 soldiers, 6 battleships, no submarines, tanks, or air force. Rhineland demilitarised. • **War Guilt**: Germany had to accept complete blame for WW1. • **League of Nations**: Germany unable to join the new peace keeping organisation.
German Reaction to the Treaty	**Dolchstoss**: 'Stab in the Back' - Critics of the treaty said that they had been betrayed by the government **Diktat**: Word used to describe German feelings towards the treaty, a 'dictated peace' that had been forced on them.



History – Rise of Dictators

Democracy	A system of government in which power is held by elected representatives who are freely voted for by the people, or held directly by the people themselves
Communism	An economic and political system in which all property is state owned (Left Wing)
Fascism	A political system that focuses on the strength of the nation (Right Wing)
Government	the group of people with the authority to govern a country or state; a particular ministry in office
Extremism	the holding of extreme political or religious views; fanaticism
Wall Street Crash	a financial crisis that occurred in October 1929, when stock prices on the New York Stock Exchange suddenly and steeply declined.
Great Depression	a period of severe global economic downturn that occurred from 1929 to 1939
Revolution	a forcible overthrow of a government or social order, in favour of a new system.
Cult of personality	is the result of an effort which is made to create an idealized and heroic image of a glorious leader.
Dictator	A single strong leader can do what they want - has complete power
Propaganda	Communications (for example posters and films) designed to mislead people by giving a very biased view
Totalitarian	A form of rule where the government has unlimited power over all parts of society
Purge	To remove a group or people often violently
Bolsheviks	Radical left wing group that seized control of Russia in 1917



Joseph Stalin
Communist dictator of the Soviet Union between 1924-53

1899 – joins a left-wing Marxist group that wants to overthrow the Russian monarchy and cause a workers' revolution.

1917 – Russian Revolution, Lenin takes control of Russia and is supported by Stalin.

1922- Stalin appointed General Secretary of the Communist Party, a powerful position.

1924 – Lenin dies, creates a leadership struggle.

1929- Stalin becomes undisputed leader of the Soviet Union



Adolf Hitler
Fascist dictator of Germany—also known as the Fuhrer between 1933-45

Joined a small nationalist group, German Workers Party in 1919.

Made popular speeches about nationalism, anti-Semitism, and blaming others for Germany's problems.

1923 – Attempted to seize power in Munich, failed and was sentenced to 5 years in prison (released after 9 months).

Became Chancellor in 1933, cracked down on opposition and became Fuhrer (dictator) in 1934



Benito Mussolini
Fascist dictator of Italy
1922 – 1943

1919 – Mussolini forms the Fascist Party. Focuses on nationalism and restoring Italy's power.

1922 – The March on Rome. Mussolini demands power and the King of Italy appoints him Prime Minister.

1925 – Mussolini uses violence, censorship and propaganda to become a dictator

History – Turning Points of World War Two

How did WW2 start?	
Nazi beliefs that helped lead to war	· Wanted to unite all German speakers · Wanted the cancellation of the Treaty of Versailles · Wanted Lebensraum or 'living space'
Hitler encouraged by policy of appeasement	· Germany allowed to re-militarise · No challenge when Germany militarised the Rhineland · The Anschluss: Germany allowed to unite with Austria · Occupation of the Sudetenland (part of Czechoslovakia)
Why did war breakout?	· Nazi invasion of Poland resulted in the French & British declaring war
Axis Powers	· Alliance of Fascist countries (**Germany, Italy & Japan**)
Allied Powers	· **British Empire, Russia** (USSR) & **USA**

Dunkirk - Coastal town in Northern France where British & French armies were forced to evacuate by the Nazis	
Reasons Dunkirk can be seen as an allied defeat	· Victory for the Germans allowing them to occupy France · The British and French left behind important equipment and 68.000 men killed, wounded, or captured.
Reasons Dunkirk can be seen as an allied victory	· 338,000 allied troops rescued · British media reported the heroic spirit of the rescue · Birth of the idea 'Dunkirk Spirit'. A country coming together in a time of adversity

Battle of Britain - Fought in the skies over southern England between the RAF (Royal Air Force) & Luftwaffe (German air force)	
Operation Sea Lion	· Nazi plan to invade Britain · First stage of the plan was to defeat the RAF
Consequences of the Battle of Britain	· British victory · Prevented a German invasion of Britain · Nazis changed tactics and started the bombing of cities (The Blitz) · Hitler turned his attention to the East

Nazi invasion of the USSR	
Operation Barbarossa	· The Nazi invasion of the Soviet Union (Russia) · Nazis invaded to gain land & resources
Stalingrad	· Russian city that suffered a brutal siege by the Germans · Huge casualties on both sides but eventually Germans defeated
Scorched Earth Policy	The Russians retreated and burnt all supplies to starve the German army
Reasons the invasion of USSR was important	· Nazis had to fight on two fronts · German army lost huge numbers in fighting the Russians · Churchill said it 'tore the heart out' of the Germans · Gave the USA & Britain time to prepare Operation Overlord

Pearl Harbour - US military base on island of Hawaii in the Pacific Ocean	
US policies before 1941	· Isolationism — US policy of avoiding involvement in world affairs · Lend Lease — US policy of supplying Britain & USSR before 1941
Reasons for the attack Pearl Harbour	· The Japanese Wanted to secure their empire in the far east · The USA had was enforcing an oil embargo against Japan · Japanese thought a surprise attack would remove the US threat
Consequences of Pearl Harbour	· Brought the powerful US into the war on the allies side · Main US involvement was the D-Day invasions leading to the defeat of Nazi Germany

Dropping of the Atomic Bomb	
End of WW2 in Europe	· D-Day invasion led to the German surrender in May 1945 · 8 May VE (Victory in Europe) Day
Continued war with Japan	· Japanese refused to surrender in May 1945 · US forces had captured the islands of Iwo Jima and Okinawa with heavy casualties on both sides
Manhattan Project	· Code name for the US development of the Atomic Bomb · Atom Bomb was used against the Japanese at Hiroshima and Nagasaki to force Japanese surrender
USA & USSR relations 1945	· USA followed a political system of capitalism · USSR followed a rival political system of communism · USA & USSR were the two superpowers at the end of WW2 · The dropping of the atom bomb could have been the US demonstrating their military strength

1933 Hitler begins to secretly rearm Germany	**Sept 1938** Munich Agreement – Hitler was allowed to occupy Sudetenland	**March 1939** Hitler invades Czechoslovakia	**3 Sept 1939** Britain & France declare war on Germany	**May 1940** Dunkirk	**Jul-Oct 1940** Battle of Britain	**Jun 1941** Operation Barbarossa	**Dec 1941** Pearl Harbour	**Jun 1944** D-Day	**May 1945** German surrender	**Aug 1945** Atom Bombs dropped. Japan surrenders

History – The Persecution of the Jews and the Holocaust

Why were Jews persecuted?	
Antisemitism	Hostile actions and prejudice towards Jewish people
Pogrom	Organised violence against Jewish communities
Stereotype	A widely held belief that is very simplified and often completely untrue
Reasons for historical persecution of Jews	• Christianity was the dominant religion in Europe • Jews were blamed for the death of Jesus • Many money lenders were Jewish so people in debt often disliked them • Jews were seen as an 'inferior' race

Persecution begins under Nazis 1933-8	
Aryan Race	The Nazi belief that white Europeans or 'Aryans' were superior to other ethnic groups
Boycott	People avoiding using certain businesses to make a point. In 1933 the Nazis encouraged Germans to boycott Jewish businesses
Nuremberg Laws	A series of laws passed in 1935 by the Nazis, said that Jews were not German citizens and banned Jews from having relationships with 'Aryans'
Reasons the Nazis disliked the Jews	• Blamed them for losing WW1 • Blamed them for causing economic problems in Germany • Stereotyped them as being anti-German

Violence against Jews and Ghettos 1938-42	
Kristallnacht 9th Nov 1938	• Means the 'Night of broken glass' • Nazi thugs destroyed thousands of Jewish businesses, burned 250 synagogues and arrested 30,000 Jews
Ghetto	• A walled off part of a city where Jews would be forced to live often in terrible living conditions with lots of disease and starvation
Warsaw Ghetto	• Ghetto in Warsaw, Poland with over 400,000 occupants • In 1943 there was an armed uprising led by a Jewish resistance group in response to people being moved to extermination camps
Einsatzgruppen	Nazi killing squads whose job it was to murder Jews in the Soviet Union (Russia)

The Final Solution	
Final Solution	The name given to the Nazi idea of dealing with the 'Jewish problem' - 6,000,000 Jews would be murdered
Wannsee Conference	Meeting held in 1942 where leading Nazis decided to exterminate the Jews under their control
Extermination camps	• Camps designed with the specific purpose of killing, often using Zyklon B gas • The largest of these camps was Auschwitz-Birkenau

1 April 1933 Nazi boycott of Jewish business begins	**15 September 1935** Nuremburg Laws strip German Jews of citizenship and basic rights	**9-10 November 1938** Kristallnacht (Night of Broken Glass): Jewish homes, businesses, and synagogues are attacked across Germany	**1 September 1939** The German invasion of Poland brings large numbers of Jews under Nazi control	**1940** Jews are forced into overcrowded ghettos	**22 June 1941** Germany invades the Soviet Union. Mobile killing squads (Einsatzgruppen) begin mass shootings of Jews	**20 January 1942** Wannsee Conference: Nazi leaders coordinate the 'Final Solution', the plan to murder Europe's Jewish population	**1942-44** Millions of Jews are deported to extermination camps such as Auschwitz-Birkenau, Treblinka, and Sobibor	**19 April – 16 May 1943** Warsaw Ghetto Uprising: Jewish resistance fighters battle Nazi forces.	**27 January 1945** Soviet troops liberate Auschwitz-Birkenau, revealing the scale of Nazi crimes	**8 May 1945** Germany surrenders. World War Two in Europe ends, bringing the Holocaust to an end

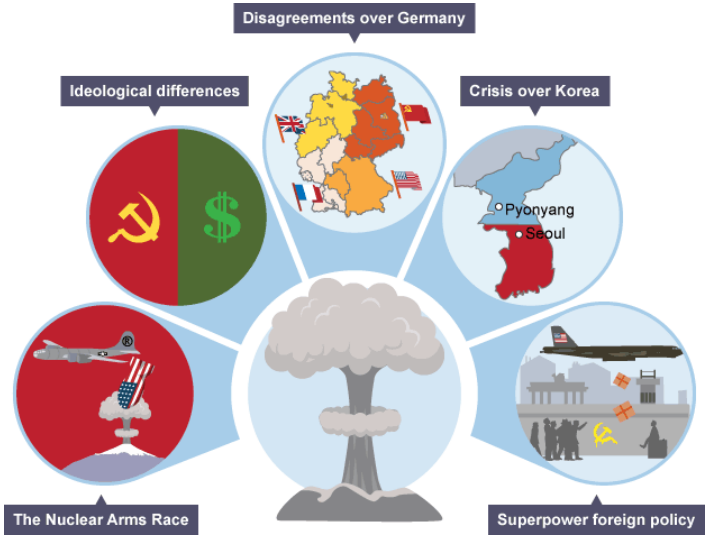
History – The Cold War

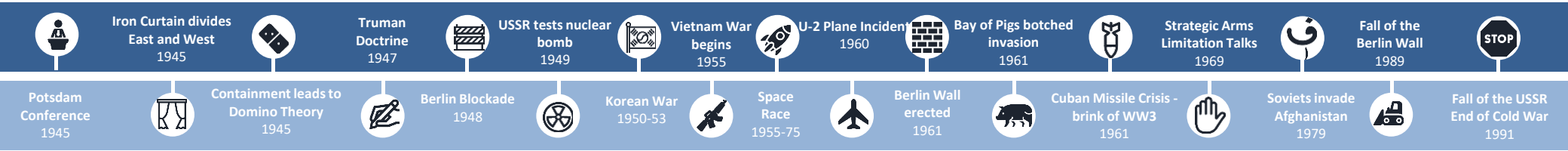
Key Vocabulary	
Capitalism	An economic system based on private ownership
Communism	An economic system based on community ownership
Democracy	A political system where people vote for their representatives
Totalitarianism	A political system where one person holds complete power
Government	A group of people responsible for running a country
Rebellion	Fighting against someone who is in power
Guerrilla Warfare	A method of fighting using ambushes, raids and surprise.
Nuclear Weapon	A weapon of mass destruction powered by a nuclear reaction.
Soviet Union	A communist country comprised of Eastern European republics.
Blockade	Sealing off a place to prevent movement of goods or people.
Domino Theory	A theory that if one country fell to communism, others would follow.
Iron Curtain	The imaginary line dividing free and communist countries in Europe.
Satellite Nations	Nations under the control of the Soviet Union.
Détente	Lessening of military and diplomatic tensions between countries.
M.A.D	Mutually Assured Destruction.
NATO	North Atlantic Treaty Organisation.
Warsaw Pact	A defence pact between the USSR and neighbouring countries
Allies	Countries that are committed to military cooperation and defence.
Brinkmanship	The practice of deliberately pushing a dangerous situation or confrontation to the very limit of safety to force an opponent to back down and make concessions
Proxy Wars	an armed conflict where a major power indirectly supports one or more combatants to fight on its behalf rather than directly engaging in the fighting themselves

At the end of World War II, the world was split into two factions; The **Western Bloc** a group of countries under capitalist rule, comprised of the United States and its allies, some of whom would later become **NATO,** and the **Eastern Bloc** - led by the USSR (known as the Soviet Union) and communist countries, some of whom would later sign the **Warsaw Pact.** An imaginary **Iron Curtain** divided east and west.

These two factions would spend the next 40+ years engaged in a stand-off - both the United States and the USSR had developed nuclear weapons - and knew that attacking the other would lead to **M.A.D. (mutually assured destruction).** There were incidents of **brinkmanship** and **proxy wars** fought in Korea and Vietnam, as the USA became increasingly concerned about a **domino** effect as neighbouring countries would fall to **communist** rule.

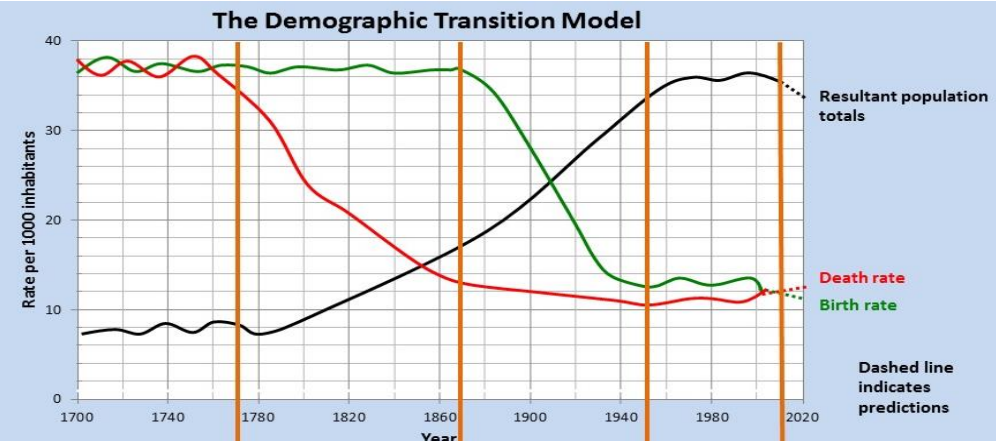
With the fall of the **Berlin Wall** in 1989, and the collapse of the USSR in 1991, the Cold War came to an end, as the world sought a more harmonious approach to co-existence.





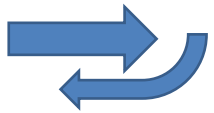
Geography - Factfulness

Key idea	Key knowledge
Distribution of wealth (patterns)	Wealth is not evenly distributed some countries have more than others; some continents tend to be richer or poorer in generally... but even within a country, or city, the spread will still be uneven.
Reasons for different levels of wealth	**War** – destroys a country's infrastructure Diseases –people are less likely to survive illnesses **Education** –cannot get qualifications to get better paid jobs and improve their quality of life **Unfair trade and debt** – Many countries are in a lot of debt and cannot pay it off. This slows development. **Gender inequality** – halving your workforce = half the money.
Development indicators	There are a variety of methods e.g. life expectancy or literacy rates that offer clues as to how developed a country is. Each has its uses, but none are perfect.
Population Pyramids	A graph that allows us to see the gender and age structure of a population. Different shapes tell us different things about the population of the country.



Key terms	Definitions
Bias	Unfair support for one idea or group over another, which can affect how information is presented.
Stereotyping	Making a simple, fixed idea about a group of people, which might not be true for everyone.
Gender Inequality	When people are treated unfairly or have different opportunities based on gender.
Demographic Transition Model	A model showing how birth and death rates change as a country develops over time.
Levels of Development	How rich, advanced, or well-off a country is, based on things like wealth, health, and education.
Birth Rate	Number born for per 1,000 people per year
Death Rate	Number of deaths per 1,000 people per year
Life Expectancy	The average number of years a person is expected to live.
(HDI) Human Development Index	A score that combines life expectancy, education, and income to measure a country's development.
Gross Domestic Product (GDP)	The total value of all goods and services a country produces in one year.
Literacy Rates	The percentage of people in a country who can read and write.
Multiplier Effect	How money spent (like from tourism or investment) creates extra jobs and spending in the local area
Poverty	Not having enough money to meet basic needs like food, shelter, and healthcare.
Diversity	A mix of different people, cultures, or ideas in one place.

Geography - Tectonics

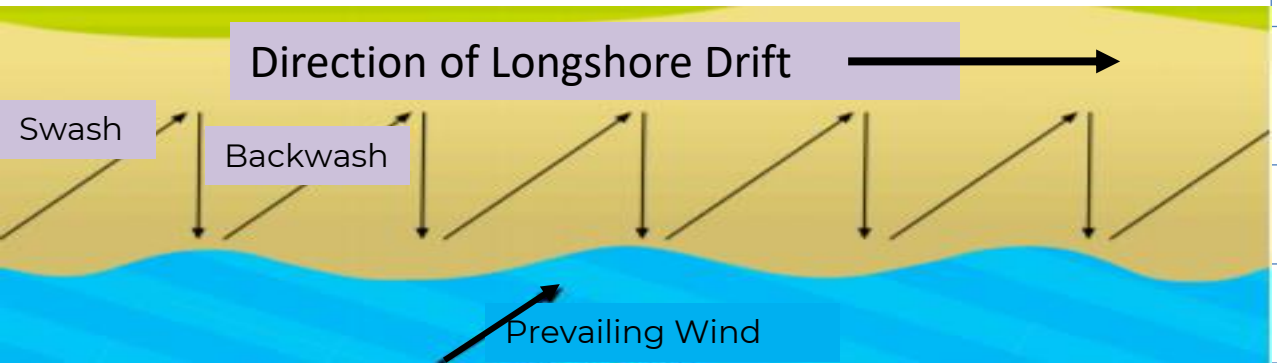
Key idea	Key knowledge
Tectonic theory	Tectonic plates move because the core of the earth is very hot and heats the magma in the mantle, this then rises as it is less dense, before reaching the crust, travelling in each direction underneath it, cooling again which makes it denser, and sinking back towards the core. As this process happens, friction moves the plates with it. Evidence for this includes matching geology and fossils on different continents, from when they were joined.
Types of plates	There are two types of tectonic plate: **Continental plates** are less dense and cannot be destroyed or renewed. The Eurasian, plate is an example. **Oceanic plates** are denser and can be destroyed and renewed at plate boundaries. An example of an oceanic plate is the Pacific plate.
Global distribution	Earthquakes are commonly found in thin narrow belts associated with a plate boundary. Most volcanoes are distributed along the plate boundaries, too, but only constructive and destructive boundaries/margins. Occasionally, volcanoes are found in the middle of plates (e.g. Hawaii). These are called hot spots.
Collision plate boundary	Two plates of equal density collide and buckle to form Fold Mountains. Found in the Himalayas. 
Constructive plate boundary	As 2 plates pull apart, eruptions occur and new crust is formed. Found in the mid-Atlantic ridge. 
Conservative plate boundary	Two plates scrape past each other, causing violent earthquakes. Found in the San Andreas fault. 
Destructive plate boundaries	Two plates of different densities move towards each other. The denser oceanic plate is subducted causing earthquakes, volcanoes and tsunamis. Found in the ring of fire. 

Key terms	Definitions
Tectonic Plates	Massive slabs of Earth's lithosphere whose interactions shape the planet's surface.
Plate boundary	The edge of a plate which interacts with it's neighbour.
Fault Line	A fracture in the Earth's crust along which significant movement has occurred, often associated with earthquakes.
Epicentre	The point on the Earth's surface located directly above the focus (origin) of an earthquake.
Focus	The point within the Earth where the earthquake occurred.
Seismic Waves	Vibrations that travel through the Earth, released by the sudden movement of rock along faults/plate boundaries.
Subduct-ion	The process by which one (denser) tectonic plate moves under another (less dense) plate, often generating intense seismic and volcanic activity.
Richter Scale	A numerical, logarithmic scale for expressing the magnitude of an earthquake on the basis of seismograph oscillations.
Magni-tude	The size of an earthquake measured on the Richter Scale.

Geography - Asia

Key idea	Key knowledge
Asia as a continent	Asia is the largest of the Earth's seven continents, with **4.9 billion** people- roughly **60% of the world's total population.** It is also its most diverse, both physically and culturally.
Physical Geography of Asia	It is bounded on the east by the Pacific Ocean, on the south by the Indian Ocean and on the north by the Arctic Ocean. The highest point in the World, is **Mount Everest** (8,848 m), situated in the Tibetan region of the Himalayas. The longest river in Asia and third longest in the World is the **Yangtze** (6,211 km) which flows through China. The largest desert in Asia is the **Gobi** desert measuring 281,800 km^2.
Human Geography of Asia	Asia is divided into **49 countries;** five of them, where over 2,300 languages are spoken on the continent. The continent has been the birthplace of most of the **world's major religions. The Fertile Crescent** is considered the birthplace of agriculture.
Climatic Zones	There are 8 main climate zones in Asia, ranging from freezing cold **Tundra** in Siberia to the hot and wet **Tropical Rainforests** of equatorial regions, such as Indonesia and much of India, via the **Alpine/Mountain** region of the Himalayas and the Gobi **Desert** of Southern Mongolia. Tropical storms, known as **Typhoons** in the Western Pacific, are a yearly threat to countries in Eastern Asia.
The Silk Road	The Silk Road was a network of trade routes which connected the East to the 'Global' West, and was central to the economic, cultural, political, and religious interactions between these regions.
The Belt and Road Initiative	The BRI is effectively a 21st century 'Silk Road', a **global infrastructure development strategy** adopted by the Chinese government in 2013, to invest in over 70 countries, significantly expanding China's influence.
Mongolia	The country experiences short hot sunny summers and extremely cold and long dry winters. 'Outer Mongolia' is often considered shorthand for the middle of nowhere – a region so remote, wild and unpopulated that it represents all that is 'other' about the world The south of the country is dominated by the vast Gobi Desert, with mountainous regions in the north. 30-40% of Mongolians are nomadic, moving their herds seasonally to find suitable pastures. Ulaanbaatar has become the most polluted city in the world, which causes serious health issues for its population. The city is built in a river valley and surrounding mountains trap smog, as most of the population rely on burning coal to provide heat.

Key idea	Key knowledge
How do waves form?	Waves are created by wind blowing over the surface of the sea. As the wind blows over the sea, friction is created - producing a swell in the water (wave energy).
Constructive waves	These waves build beaches up because they push material onto the shoreline.
Destructive waves	These waves remove beaches material.
The cliffs can be altered	Weathering happens at the cliff top, while erosion undermines cliffs at the base. Together they lead to cliff retreat and mass movement.
Material moves	Energy allows the waves to carry (transport) material depending on it's size.
Deposition	Material is dropped when there is a loss of wave energy.
Features of the coast	A coastline is made up of a series of **erosional** and **depositional landforms (features)**.
Longshore drift	Material is moved along coastlines because of the wind approaching at an angle.
Managing the coast	A variety of methods can be employed to try and stop coastal erosion impacting on human activities. These are grouped into hard and soft engineering strategies.



Key terms	Definitions
Fetch	The distance wind travels over water.
Prevailing wind	The normal wind direction.
Swash	Movement of wave up a beach.
Backwash	Movement of a wave down a beach.
Weathering	Where the weather, plants and chemical reactions affect the cliffs of the coast.
Erosion	The energy of waves removes material from the cliff base.
Transportation	Material is moved.
Mass movement	A large amount of material shifts under gravity down the cliff.
Headlands	Areas of coastline made of harder rock that stick out into the sea.
Bays	Areas of coastline made of softer rocks which cut into the land.
Hard engineering	A man made structure to reduce erosion
Soft engineering	An enhancement of a natural sea defence.

BVT Unit 1: Buddhism

Key Vocabulary	Definitions
Anatta	The belief that **we** are always changing; we hold no permanent identity
Anicca	The belief that everything in life is always changing
Eightfold path	8 principles of doing things morally right to benefit yourself and society
Enlightenment	A state of peace and harmony, where everything is in balance
Five Precepts	5 rules for Buddhists to keep to maintain Right Action
Four Noble Truths	4 truths from Buddha, after his realisation of suffering when seeing the 4 Sights
Four Sights	Buddha saw 4 things that shocked him: elderly man, dead man, sick man and a Holy man.
Karma	The belief that our actions have consequences in life and between lives.
Middle Way	Living a balanced life: Not one of luxury/richness, but not one of poverty and suffering
Nirvana	At the point of enlightenment – when Samsara ends.
Reincarnation	The re-birth based on karma at the end of each life. You can be reincarnated into 6 different realms
Samsara	The belief of birth, death and rebirth (reincarnation). It is about the cycle of life.
Temple	Place of worship, meditation and offering
Tripitaka	Buddhist religious text/scripture
Vihara	Where Buddhist monks live – an area in the temple
Wesak	Buddhist Festival recognising Buddha and his teachings

Beliefs / Practices:

- Buddhism does **NOT** believe in a God.
- **Siddhartha Gautama** became Buddha and started the religion in the 500's BC.
- He lived a sheltered life, but one day saw the **4 Sights** and realised he wanted to find truths about the world and help others.
- Buddhists aim to live to **avoid suffering** for themselves and others; to live a balanced life, following the **Middle Way**.
- They follow the principles within the **Eightfold Path**, including **Right Action** which is to follow the **5 Precepts**.
- After death Buddhists believe in **reincarnation** and **samsara** or the cycle that life continues.
- **Buddhist Practices**: Buddhists worship at a **temple**. Buddhists mediate and chant and leave **offerings** in a **Shrine Room**. Their Holy Book is the **Tripitaka** and the Festival that remembers Buddha is **Wesak**

Key Quotes by Buddha:

"Nothing is impermeable, strive on with awareness"

"Happiness is a choice and suffering is optional"

"Contentment is the greatest wealth"

"Speak well of others, not of their faults"

"Self control is strength"

BVT Unit 2: Human Rights

Key Vocabulary	Definitions
Amnesty International	A charitable global organisation that campaigns for Human Rights
Capital Punishment	The Death Penalty – executing someone for their crime
Civil Rights Campaign	The campaigns or protests to improve peoples' political and social rights in society
Discrimination	Treating someone differently and unfairly / unequally because of who they are
Extremism	Holding extreme religious or political views, which can pose a threat to the safety of others.
Golden Rule	That we treat people how we would want to be treated – a rule in religions and for Humanists
Humanist	A non religious group that uses ethics, reason and compassion for the well-being of humanity and the planet in their life.
Human Rights	The rights a person is entitled to simply because they are human
Islamophobia	Prejudice of hate and fear against Muslims

Key Vocabulary	Definitions
Morals and Ethics	Judging what is right and wrong by society and by using your conscience
Prejudice	Having a negative pre conceived idea or stereotype of someone because of who they are
Radicalisation	When a person is brain-washed or manipulated into thinking extreme thoughts and doing extreme actions
Reformation	Reforming or changing someone's behaviour for the better. Reformation can happen in prison so criminals see the errors of their ways.
Rehabilitation	To change someone's poor behaviour, rehabilitation involves programs such as education to achieve this.
Reoffending	When a criminal comes out of jail and commits another crime.
Retribution	To achieve justice or make right. Can be seen as revenge
Sanctity of Life	Life is precious and special from God and should not be taken

<u>Key Quotes linked with Human Rights / Equality:</u>

"Treat other people as you'd want to be treated in their situation" The Golden Rule (Humanism)

"Think for yourself, Act for everyone" Humanist Motto

"God made man in his image" Bible

"There is neither Jew nor Greek, male nor female, we are all one in Jesus Christ" Bible



Beliefs / Practices of Martin Luther King:

- King was a Christian preacher and **pacifist** (peaceful)
- King used **non-violent** protests such as bus boycotts, sit-ins and peace marches.
- **King's Selma Marches**: 1965 King organised a peaceful march from Selma to Montgomery. This was in protest to **voting** restrictions. At the first march the protestors were attacked; however after trying again support rose to 3,500 people who marched into Montgomery. This put pressure on the President to change the law for voting.

Key Quotes for non violence & forgiveness:

Christianity:
"Non-violence is the answer – the foundation of such a method is love" Martin Luther King
"Turn the other cheek" Jesus
"Lets not love with words or thoughts...but with actions" Bible
"Blessed are the peacemakers" Jesus
"Thou shall not kill" 10 Commandments
"I your God, give life and take it away" Bible

Buddhism:
"Hatred will not cease by hatred but by love alone" Dali Lama
5 Precepts: Do not harm any living thing
Eightfold Path: Right Action and Right Intention

Islam:
"God is most forgiving and merciful" Qur'an
"Do not take a life that God has made sacred" Qur'an

Beliefs / Practices:

- **Human Rights**: In **1948 the United Nations** set out a document for countries to follow, to grant their citizens basic human rights. There are 30 Human rights in this document.
- **Religious Rights**: The right to belong to a religion; to worship freely. The right to express your religion through worship, actions or clothing.
- **Right to racial equality**: Began with the **Civil Rights Movement** led by Martin Luther King. More recent campaigns such as **BLM**.
- **Right to Life**: **Capital Punishment** or the death penalty. This punishment is often used as a **deterrent** for other crimes and to gain **retribution** for a crime. Countries that have the death penalty are: USA in some states, some Middle Eastern countries such as Saudi Arabia and Iran. However China has the highest record for issuing the death penalty. **Amnesty International** campaign against capital punishment.
- Some countries have laws that can stop people from having rights.

Key Quotes for capital punishment:

- "We will show you the truth of what you did" Qur'an
- "An eye for an eye, a tooth for a tooth" Bible
- "A life for life" Qur'an
- "Stand up firmly for justice" Qur'an

BVT Unit 3: Philosophy and Religion

Key Vocabulary	Definitions
Conscience and morality	Human sense and understanding to tell us right and wrong
Design argument	The argument that our existence was designed, because it is so complex to be by chance.
Epicurus	Greek Philosopher to challenge the nature of God
First Cause	The argument that our existence must have been caused as nothing happens without a cause. Therefore something or someone must have caused our existence.
God of the Gaps	The idea that science, knowledge and exploration has filled the gaps where previously we used God to explain.
Immanuel Kant	Philosopher who argued we have inbuilt morals; he theorised these are rules we obey and therefore a ruler maker designed it this way.
Immortality	Living forever, never dying.
Natural Law	The belief that humans are easily tempted and cannot reason because by nature they are weak and sinful
Natural Evil	Acts of evil and suffering which are not caused by humans e.g. volcanoes, hurricanes
Moral Evil	Acts of evil and suffering caused by humans e.g. murder.
Philosophy	The study of questions about existence, knowledge, values, reason, mind, and language.
Resurrection	Rebirth into the afterlife.
Theologian	Person that studies theology or religion
Thomas Aquinas	Christian theologian who came up with First Cause argument.
William Paley	Christian philosopher who argued "existence by design."

Beliefs on Existence of God:

- **Design Argument:** William **Paley's** argument that it seemed extremely unlikely that such a **complex**, life-supporting universe happened **by chance**. It must have been **designed**, and there must be a designer, such as God.
- **First Cause Argument**: Thomas **Aquinas** argued that some things are caused and that anything that's caused, must have been caused by something else (**cause & effect**). Nothing can cause itself - there must be a **first causer, itself uncaused**. This causer was **GOD**.
- **Morality Argument:** Immanuel **Kant** argued as morals seem to be so well established, it seems like they might even be **hardwired** into the human mind by a **rule maker** such as God.
- **God of Gaps:** The idea that science, knowledge and exploration has developed our understanding of the world. What we didn't know previously was very large and often put down to God. As we learn more, the gap of what we account to God is shrinking.

Beliefs on Evil and Suffering:

- Theologian **Irenaeus** said we were not created perfectly by God and suffering is a way we can learn about ourselves and improve ourselves.
- Philosopher **Epicurus** questioned the intention and ability of God to stop evil. He **questioned** whether **God** had any control over evil and our suffering.
- **Saint Augustine** said that suffering comes from evil that is within us all, because it has passed down the generations through **Eve's original sin.**
- **Pope John Paul** said that humans are **tempted** by evil because humans by nature are sinful and weak (Natural Law), thus causing suffering.

Key Vocabulary	Definitions
Quand	When?
Où	Where?
Comment	How?
Combien	Hom much/many?
Qui	Who?
Pourquoi	Why?
Quoi	What?
Qu'est-ce que	What?
Est-ce que	Do ? (Only for a question)
Le / La / Les	The (m) / The (f) / The (pl)
Un / Une / Des	A (m) / A (f) / Some (pl)

L'alphabet

A ah	H ash	O oh	V vay
B bay	I ee	P pay	W doobla-vay
C say	J shee	Q coo	X ix
D day	K car	R air	Y ee-grek
E er	L ell	S ess	Z zed
F eff	M emm	T tay	
G shay	N enn	U ooo	

Pronunciation

- Silent last consonants –**t/d/s**
- **é** - 'ay' café
- **è/ê** - père, fête
- **ç** - soft 's' - français
- **oi** - 'wah' - noir

Essential numbers that can be used to build others

1- un	2- deux	3- trois	4- quatre	5- cinq
6- six	7- sept	8- huit	9- neuf	10- dix
11- onze	12- douze	13- treize	14- quartorze	15- quinze
16- seize	17- dix-sept	18- dix-huit	19- dix-neuf	20- vingt
30- trente	40- quarante	50- cinquante	60- soixante	70- soixante-dix
80- quatre-vingts	90- quatre-vingt-dix	100- cent	71 = 70+11 91 = 90+11	

French Verb Conjugations – Present Tense

Avoir = to have			
J'ai	I have	**Nous avons**	We have
Tu as	You have	**Vous avez**	You all have
Il/elle/on a	He/she/one has	**Ils/elles ont**	They have

Faire = to do			
Je fais	I do	**Nous faisons**	We do
Tu fais	You do	**Vous faites**	You all do
Il/elle/on fait	He/she/one do	**Ils/elles font**	They do

Aller – to go			
Je vais	I go	**Nous allons**	We go
Tu vas	You go	**Vous allez**	You all go
Il/elle/on va	He/she/one goes	**Ils/elles vont**	They go

Être = to be			
Je suis	I am	**Nous sommes**	We are
Tu es	You are	**Vous êtes**	You all are
Il/elle/on est	He/she/one is	**Ils/elles sont**	They are

Regular Present Tense Verb Endings.
Remove the –er/-ir/-re first and then add the endings

	-ER	-IR	-RE
JE	-E	-IS	-S
TU	-ES	-IS	-S
IL - ELLE - ON	-E	-IT	----------
NOUS	-ONS	-ISSONS	-ONS
VOUS	-EZ	-ISSEZ	-EZ
ILS	-ENT	-ISSENT	-ENT

French Verb Conjugations – Past Tense (Passé Composé)

To make the past tense use the correct part of the verb to have and then add the past participle (verb in the past)

J'ai
Tu as
Il/elle/on a
Nous avons
Vous avez
Ils/elles ont

Remove the –er/ -ir/ -re to create the past participle and add the ending		
Jouer (to play)	jou-	joué
Finir (to finish)	fin-	fini
Vendre (to sell)	end-	vendu

Certain verbs need to use the verb être to create the past tense – add an **e** for feminine and **s** for plural

Je suis	allé(e)
Tu es	allé(e)
Il/elle/on est	allé(e)
Nous sommes	allé(e)s
Vous êtes	allé(e)(s)
Ils/elles sont	allé(e)s

I went

resté - stayed
arrivé - arrived

Past Tense Time Phrases	
hier	yesterday
l'année dernière	last year
L'été dernier	last summer
La semaine dernière	last week
Le weekend dernier	last weekend

French Verb Conjugations – Future

To make the future tense you use the verb aller and add the infinitive (verb ending in –er/-ir/-re)

Je vais
Tu vas
Il/elle/on va
Nous allons
Vous allez
Ils/elles vont



Infinitive
jouer
finir
vendre

Je vais jouer – I am going to play
Tu vas finir – you are going to finish
Elle va vendre – she is going to sell.

To create the simple future (will) you take the verb and add the following endings.
-er verbs remove the final e

I	Je
You	Tu
he/she/we	Il/elle/on
we	Nous
You /you all	Vous
theythey	Ils/elles



jouer**ai**
jouer**as**
jouer**a**
jouer**ons**
jouer**ez**
jouer**ont**

Je jouerai – I will play

Tu finiras – you will finish

Elle vendra – she will sell.

Future Tense Time Phrases	
demain	tomorrow
L'année prochaine	next year
L'été prochain	next summer
La semaine prochaine	next week
Le weekend prochain	next weekend

French Verb Conjugations – Imperfect (was ing.... / used to ....)

To make the imperfect tense you use the nous form of the verb in the present, remove **– ons** then add the endings

	-er verbs (jouons)	-ir verbs (finssons)	-re verbs (vendons)
Je	jou**ais**	finiss**ais**	vend**ais**
Tu	jou**ais**	finiss**ais**	vend**ais**
Il/elle/on	jou**ait**	finiss**ait**	vend**ait**
Nous	jou**ions**	finiss**ions**	vend**ions**
Vous	jou**iez**	finiss**iez**	vend**iez**
Ils/elles	jou**aient**	finiss**aient**	vend**aient**

Irregular verb – to be (used to be / I was)
J'étais
Tu étais
Il/elle/on était
Nous étions
Vous étiez
Ils/elles étaient

Je jouais – I used to play OR I was playing

Opinions	
J'aime / Je n'aime pas	I like / I don't like
J'adore / Je déteste	I love / I hate
Je m'intéresse à	I am interested in
Je me preoccupe de	I am worried about

If using a verb it needs to be in the infinitive

- J'aime jouer au foot - I like to play/playing football

French Adjective Agreements

Adjectives change their endings depending on whether the thing you are describing is masculine, feminine or plural

Regular Adjectives – most follow this pattern				
	Masculine	Feminine	Masculine Plural	Feminine Plural
petit	petit	petite	petits	petites
timide	timide	timide	timides	timides
fatigué	fatigué	fatiguée	fatigués	fatiguées

Adjectives in French go after the noun **NOT** before like in English

Le chat noir – the black cat
La personne intelligente – the intelligent person
Les garçons timides – the shy boys
Les filles fatiguées - the tired girls

Irregular adjectives				
	Masculine	Feminine	Masculine Plural	Feminine Plural
sérieux	sérieux	sérieuse	sérieux	sérieuse
gros	gros	grosse	gros	grosses
bon	bon	bonne	bons	bonnes
gentil	gentil	gentille	gentils	gentilles
blanc	blanc	blanche	blancs	blanches
actif	actif	active	actifs	actives

EXCEPT – the following go **before** the noun

beau/belle - beautiful
joli(e) - pretty
grand (e) - big
petit (e) - small
vieux / vielle - old

Possessive Adjectives - change depending on what is being described			
	Masculine	Feminine	Plural
Mine	**mon**	**ma**	**mes**
Yours	**ton**	**ta**	**tes**
His / Hers / Theirs	**son**	**sa**	**ses**
Ours	**notre**	**notre**	**nos**

Comparisons

le/la/les	plus (most) moins (less)	+ adjective
le/la	meilleur (the best pire (the worst)	

Key Vocabulary	Definitions
¿Cuándo?	When?
¿Dónde	Where?
¿Cómo?	How?
¿Cuánto?	Hom much/many?
¿Quién?	Who?
¿Por qué?	Why?
¿Qué?	What?
¿Cuál?	Which?
El / La / Los / Las	The (m) / The (f) / The (pl)
Uno / una / unos / unas	A (m) / A (f) / Some (pl)

Pronouns			
Yo	I	**Nosotros**	We
Tú	You	**Vosotros**	You all
Él / Ella / Usted	He / She / You formal	**Ellos / Ellas**	They

A - ah	B - beh	C - seh	D - deh	
E - eh	F - eh feh	G - heh	H - ah cheh	
I - ee	J - hoh tah	K - kah	L - eh leh	
M - eh meh	N - eh neh	Ñ - eh nieh	O - oh	
P - peh	Q - koo	R - eh reh	S - eh seh	
T - teh	U - oo	V - oo beh	W - oo beh doh bleh	
X - eh kiss	Y - yeh	Z - seh tah		

Sounds

ll - 'yay' ge - 'he' j - 'huh' rr – rolled qu - 'k'

Essential numbers that can be used to build others

1- uno	2- dos	3- tres	4- cuatro	5- cinco
6- seis	7- siete	8- ocho	9- nueve	10- diez
11- once	12- doce	13- trece	14- catorce	15- quince
16- dieciséis	17- diecisiete	18- dieciocho	19- diecinueve	20- veinte
30- treinta	40- cuarenta	50- cincuenta	60- sesenta	70- setenta
80- ochenta	90- noventa	100- cien	500 = quinientos	

Spanish Verb Conjugations – Present Tense

Tener = to have			
Tengo	I have	**Tenemos**	We have
Tienes	You have	**Tenéis**	You all have
Tiene	He/she/you formal has	**Tienen**	They have

Faire = to do			
Hago	I do	**Hacemos**	We do
Haces	You do	**Hacéis**	You all do
Hace	He/she /you formal does	**Hacen**	They do

Ir – to go			
Voy	I go	**Vamos**	We go
Vas	You go	**Vais**	You all go
Va	He/she/you formal goes	**Van**	They go

Être = to be			
Soy	I am	**Somos**	We are
Eres	You are	**Sois**	You all are
Es	He/she/ you is	**Son**	They are

Regular Present Tense Verb Endings. Remove the –ar/-ir/-re first and then add the endings

Pronouns		-ar	-er	-ir
I	Yo	o	o	o
You	Tú	as	es	es
He/she/it	Él/Ella	a	e	e
We	Nosotros	amos	emos	imos
You guys	Vosotros	áis	éis	ís
They	Ellos/Ellas	an	en	en

Spanish Verb Conjugations – Past Tense (Preterito)

Pronoun	-ar verbs (habl**ar**)	-er (com**er**) + -ir (viv**ir**) verbs
Yo (I)	hablé	comí / viví
Tú (You)	hablaste	comiste / viviste
Él /ella /usted (he/she/you formal)	habló	comío / vivío
Nosotros (We)	hablamos	comimos / vivimos
Vosotros (You all)	hablasteis	comisteis / vivisteis
Ellos/ Ellas (They)	hablaron	comieron / vivieron

Key Irregular Verbs

Pronoun	ir (to go) ser (to be)	tener (to have)	hacer (to do)
Yo	**fui**	**tuve**	**hice**
Tú	**fuiste**	**tuviste**	**hiciste**
Él /ella /usted	**fue**	**tuvo**	**hizo**
Nosotros	**fuimos**	**tuvimos**	**hicimos**
Vosotros	**fuisteis**	**tuvisteis**	**hicisteis**
Ellos/ Ellas	**fueron**	**tuvieron**	**hicieron**

Past Tense Time Phrases	
ayer	yesterday
el año pasado	last year
el verano pasado	last summer
La semana pasada	last week
el fin de semana pasado	last weekend

Spanish Verb Conjugations – Future (will)

Time Phrases	Infinitive + ending	
La semana próxima (next week) **mañana** (tomorrow) **El fin de semana próximo** (next weekend) **El año próximo** (next year) **En el futuro** (in the future) **Cuando sea más mayor** (when I will be older)	yo Tú él / ella / usted nosotros vosotros ellos / ellas	hablar**é** hablar**ás** hablar**á** hablar**emos** hablar**éis** hablar**án**
	Irregular Stems	
	hablar**é** hablar**ás** hablar**á** hablar**emos** hablar**éis** hablar**án**	tendr**é** har**é** dir**é** saldr**é**

To go		infinitve
voy	**a**	hablar comer vivir
vas		
va		
vamos		
vais		
van		

Future – am going to .....

Voy a ir a la playa – I am going to go to the beach

Vamos a jugar al fútbol - We are going to play football

Spanish Verb Conjugations – Imperfect (was ing.... / used to ....)

To make the imperfect tense take the infinitive and remove the –ar/-er/-ir + endings

	-ar (hablar)	-er/-ir (comer/vivir)
Yo	habal**aba**	com**ía**
Tú	habl**abas**	com**ías**
Él /ella /usted	habl**aba**	com**ía**
Nosotros	habl**ámos**	com**íamos**
Vosotros	habl**abais**	com**íais**
Ellos/ Ellas	habl**aban**	com**ían**

Irregular verbs ir-to go and ser (to be)	
iba	era
ibas	eras
iba	era
ibamos	eramos
ibais	erais
iban	eran

hablaba – I used to talk **OR** I <u>was</u> talking

Opinions	
Me gusta(n) / No me gusta(n)	I like / I don't like
Me encanta(n) / Me chifla(n) / Odio	I love / I love / I hate
Me preocupa(n)	It worries me
Me interesa(n)	I am interesed in

When talking about 1 thing
- Me gusta el chocolate

When talking about multiple things
- Me gusta**n** los gatos

If using a verb it needs to be in the infinitive
- Me gusta jugar al fútbol - I like to play football

Spanish Adjective Agreements

Adjectives change their endings depending on whether the thing you are describing is masculine, feminine or plural

Regular Adjectives – most follow this pattern				
	Masculine	Feminine	Masculine Plural	Feminine Plural
pequeño	pequeño	pequeña	pequeños	pequeñas
trabajador	trabajador	trabajadora	trabajadores	trabajadores
inteligente	inteligente	inteligente	inteligentes	inteligentes
feliz	feliz	feliz	felices	felices

Adjectives in Spanish go after the noun NOT before like in English

El gato negro – the black cat
La persona inteligente – the intelligent person
Los niños tímidos – the shy boys
Las niñas cansadas - the tired girls

Comparisons in Spanish

el / la / los / las	más (most) menos (least)	+ adjective el más intelligente – the most intelligent la menos simpatica – the least nice
el / la	mejor – the best	peor – the worst

Possessive Adjectives - change depending on what is being described				
	Masculine	Feminine	Masculine Plural	Feminine Plural
Mine	**mi**	**mis**	**mis**	**mis**
Yours	**tu**	**tu**	**tus**	**tus**
His / Hers / Theirs	**su**	**su**	**sus**	**sus**
Ours	**nuestro**	**nuestra**	**nuestros**	**nuestras**

ART - ALEBRIJES

FORMAL ELEMENTS	Definitions
Line	A **LINE** is the path left by a moving point, eg. A pencil or a brush dipped in paint. A **LINE** can take many forms, eg. Horizontal, diagonal or curved. A **LINE** can be used to show contours, movements, feelings and expressions.
Tone	**TONE** means the lightness or darkness of something. This could be a shade 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, cube or a cone. Sculpture and 3D design are about creating **FORMS**
Texture	**TEXTURE** is the surface quality of something, the way something feels or looks like it feels. There are two types of texture: **ACTUCAL TEXTURE** and **VISUAL TEXTURE**. **ACTUAL TEXTURE**: really exists so you can feel it and touch it **VISUAL TEXTURE**: created using different marks that represent actual **TEXTURE**
Colour	There are 3 primary **COLOURS**: **RED**, **YELLOW**, **BLUE** By mixing any 2 **PRIMARY COLOURS** together you create **SECONDARY COLOURS**; **ORANGE**, **GREEN**, **PURPLE**
Pattern	**PATTERN** is a design that is created by repeating **LINES**, **SHAPES**, **TONES** or **COLOURS.** Patterns can be manmade or natural.

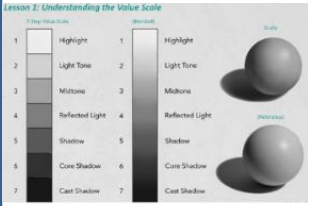
Alebrijes are brightly coloured Mexican folk art sculptures inspired by mythical creatures. Artist Pedro Linares invented the style of and name of the Alebrijes, which originated in Mexico City. The story goes that Linares was very ill in 1936 and while in his sick bed, he dreamt of strange places and animals. He saw '*a donkey with butterfly wings, a rooster with bull horns, a lion with an eagle head and all of them were shouting one word, 'Alebrijes! Alebrijes! Alebrijes!'*. Once recovered from his illness, Linares started to recreate the creatures he had dreamt about. Originally, the Alebrijes were made from a range of papers, and engrudo (a kind of glue made from wheat flour and water) to create a papier mache sculpture. Today, most Alebrjies are made from wood (though some are still papier mache). In the 1980s Linares was invited to take part in a series of workshops with other Mexican artists and makers. Through the exposure of Linares' creatures and style, other artists soon adapted their own carvings of creatures, adding more mythical elements to their own animal designs.





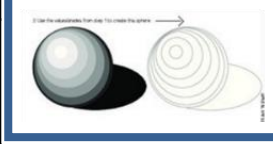
Pedro Linares





Mexican Pattern











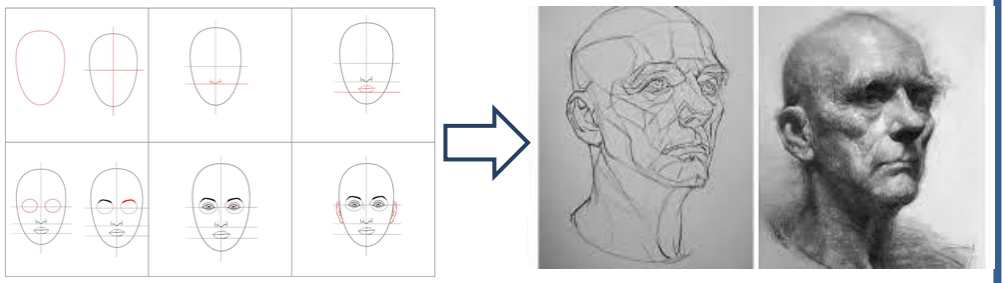
Farid Rueda



ART - PORTRIATURE AND IDENTITY

PORTRAITURE evolved from ancient symbolic depictions of power into a method used to explore human identity. Over history, portraiture has moved through religion to psychological studies, to modern exploration of identity, expression and everyday reality.

HOW TO BUILD A PORTRAIT



STYLES OF PORTRAITURE



IDENTITY: In many works of art, objects have meaning. This type of art is called Vanitas. Vanitas is art that is symbolic, displaying a narrative throughout the image using objects to represent different elements of life and death as well as individual identities. There will always be a light source from the top of the image, cutting diagonally through the image. This light represents the afterlife, whatever that might be.

Traditional Vanitas



Modern Vanitas



SYMBOLISM CHEAT SHEET:
Shells = travel and wealth
Books = education and wealth
Instruments/Art tools = education, creativity and wealth
A vessel (jug) upright = life
A vessel on it's side = death
Skull = death
Candle lit = life, candle out = death
Directional light = the heavens or afterlife

COLOUR	LINE	SHAPE/FORM/SPACE	PATTERN/TEXTURE	TONE
BRIGHT	FLUENT	CLOSED	REPEATED	BRIGHT
BOLD	CONTINUOUS	OPEN	UNIFORM	DARK
VIBRANT	CONTROLLED	DISTORTED	GEOMETRIC	FADED
PRIMARY	LOOSE	FLAT	RANDOM	SMOOTH
SECONDARY	POWERFUL	ORGANIC	SYMMETRICAL	HARSH
TERTIARY	STRONG	POSITIVE	SOFT	CONTRASTING
RADIANT	ANGULAR	NEGATIVE	IRREGULAR	INTENSE
VIVID	FLOWING	FOREGROUND	UNEVEN	SOMBRE
DULL	LIGHT	BACKGROUND	ROUGH	STRONG
CONTRASTING	DELICATE	COMPOSITION	BROKEN	POWERFUL
COMPLIMENTARY	SIMPLE	ELONGATED	GRID	LIGHT
HARMONIOUS	THICK	LARGE	FLAT	MEDIUM
MONOCHROME	THIN	SMALL	WOVEN	DARK
NATUARL	BROKEN	2D	ORGANIC	LAYERED
SATURATED	OVERLAPPING	3D	SMOOTH	DEPTH
PASTEL	LAYERED	TWISTED	ABSTRACTED	DEVELOPED
COOL	MARK MAKING	JAGGED	COLOURFUL	SOFT
WARM				

ART - FOOD IN ART

HISTORY OF FOOD IN ART

Food has always appeared in art, from the Romans to 1960s Pop Art, Cave Art to 21st century hyper realistic paintings.
Artists record the world around them, and this often includes food, whether it is in still life form and realistic or abstracted through simplification.
We are going to explore the subject matter of food not only through observational studies but through the lens of graphic design and advertisement. Companies want us to buy their products so have to make them visually appealing.
Art is a powerful tool for companies!

WAYNE THIEBAUD

Wayne Thiebaud was an American painter known for his use of impasto (thickly applied paint) paintings of food like cakes, pieces and ice creams. Thiebaud is linked to the Pop Art movement of the 1950s and 1960s with his use of bright, cold colour. However, his more traditional application of paint and technique of painting from memory set hi, apart from other artists of the time.
Theibaud would use a wide range of colour within his work and is known for his strong use of light, with his cast shadows often painted with cobalt blue and pale purple.

ART ANALYSIS GUIDE

ARTIST RESEARCH SENTENCE STARTERS

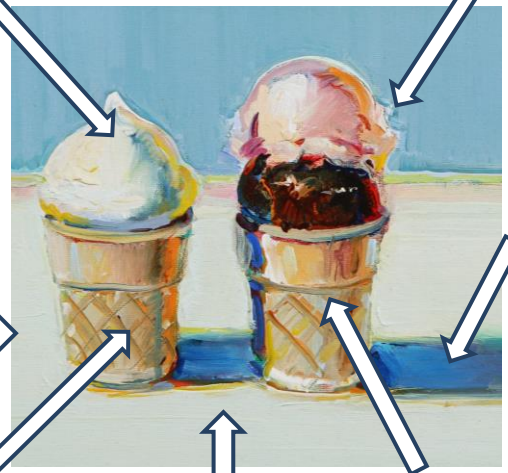
- My chosen artist works with the materials:...
- I like/don't like the work of my chosen artist because...
- The mark making in the image creates...
- In my own work I will try to create...in the style of my chosen artist.
- I would describe the pattern/tone/detail in this image as...

SENTENCE STARTERS FOR TALKING ABOUT YOUR OWN WORK

- I can vary tone by...
  - layering mark making
  - using a range of pencils
  - varying the pressure of my marks
  - using an eraser to add highlights

- My work is successful because...
- I could develop my work further by...
- My design was inspired by the work of...

IMAGE ANALYSIS



Not just one colour used, blues are added into whites to add shadows.

Reds, oranges, yellows and warmer pinks are added to create a range of tones within the ice cream.

The background is simple and clear, drawing the eye to the ice creams.

Cobalt blue is used for the strong cast shadow, getting darker towards the object.

Paint has been applied thickly (this technique is called impasto) which creates a sense of texture.

The composition is limited and centralised.

Not every detail and line is painted in, colours are applied thickly to create a sense or impression of detail and texture.

MUSIC - DANCE MUSIC AND FILM COMPOSITION

Key Vocabulary	Definitions
PULSE	A steady pulse that remains the same throughout the whole piece unless it is changed by the tempo.
RHYTHM	The order of musical events.
METRE/TIME SIGNATURE	This dictates how many beats there are in a bar.
BAR	This is a segment of time containing a set number of beats.
BAR LINE	This marks the beginning and end of a bar.
SIMPLE TIME	Simple time is a type of meter where each beat divides naturally into two equal parts.
COMPOUND TIME	Compound time is a type of musical meter where each main beat is divided into three smaller notes.
LEITMOTIF	a recurrent theme throughout a musical or literary composition, associated with a particular person.
DIEGETIC SOUND	Diegetic sound is any sound that originates within a film and can be heard by the characters.
NON DIGETIC SOUND	Non-diegetic sound is audio in a film that the audience can hear but the characters cannot.
FILM SCORE	A film score is original music composed specifically to accompany a motion picture.
SOUND TRACK	A sound track is a selection of already published songs or pieces to accompany a motion picture.
UNDERSCORE	Underscore music refers to background music that enhances a scene.

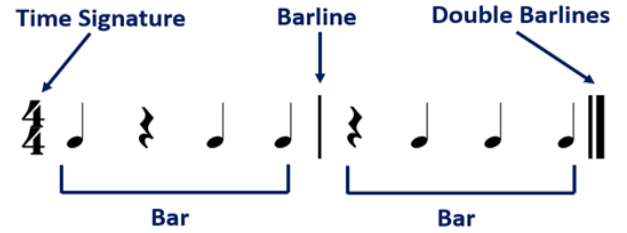
Theory for Composition



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

The repeating pattern of beats gives us the **METRE** or the **TIME** of the music, shown by the **TIME SIGNATURE** at the start of a piece of music. Each repetition of the beat-pattern is called a **BAR** and bars are separated by vertical lines called **BARLINES**.

A **DOUBLE BARLINE** always comes at the end of a piece of music or section of music.



The **TOP NUMBER** of a time signature tells you how many beats there are in each bar. The **BOTTOM NUMBER** tells you what types or note values these beats are (as divisions of a semibreve = 1):

1 = Semibreve
2 = Minim
4 = Crotchet
8 = Quaver
16 = Semiquaver

4/4 can also be shown by a "C" meaning **COMMON TIME**



MUSIC - MUSIC FOR VIDEO GAMES and NEW DIRECTIONS



Fully-orchestrated **SOUNDTRACKS** (video game music scores) are now popular – technology is used in their creation but less in their performance. The composer uses **MUSIC TECHNOLOGY** to create the score, it is then played by an **ORCHESTRA** and then digitally converted and integrated into the game. Video game **SOUNDTRACKS** have become popular and are now commercially sold and performed in concert with some radio stations featuring entire shows dedicated to video game music.

PHASE SHIFT (PHASE IN/OUT) – when two or more motifs or cells begin in **UNISON** and gradually become "out of sync" with each other through displacement, either forwards or backwards.

METAMORPHOSIS – tiny changes are made over time to one note or to one part of the rhythm. This can go a "full circle" and end up exactly the same at the end.

ADDITIVE MELODY – adding notes to an original melodic cell gradually.

ISORHYTHMIC OVERLAP – combining different length motifs or ostinato patterns

AUGMENTATION – doubling the note values of a motif or cell.

DIMINUTION – halving the note values of a motif or cell.

RETROGRADE/INVERSION/RETROGRADE INVERSION

Key Vocabulary	Definitions
Sound effects	An artificial sound used to enhance game play
Chiptunes or 8-bit Music	A style of music using simple synthesised sound used in early gaming.
Sampling	A technique of digitally encoding sound or music.
Character Motif	A short music phrase that describes a gaming character.
Minimalism	is a style that emphasizes simplicity, repetition, and gradual change, often using limited musical materials to create hypnotic or meditative effects.
Expressionism	is a style that emphasizes the intense, often unsettling expression of subjective emotions
Serialism	a compositional technique that uses a series or sequence of musical elements to structure a piece of music

MUSIC - SAMBA AND WHAT MAKES A GOOD SONG?

Key Vocabulary	Definitions
Call and Response	A musical technique where one phrase (the call) is answered by another phrase (the response).
Sambista	The conductor of a Samba band.
Cyclic Rhythm	A repeating musical rhythm.
Percussion	Instruments that are hit or scraped to produce sound.
Syncopation	Playing or singing off the beat.
Polyrhythm	Several independent rhythms being played at the same time.
Song Structure	How a song is built up with divided sections.
Middle 8	A section of a song that provides contrasting material.
Pre-Chorus	An optional section of a song that occurs before the main chorus.
Coda	The final section of a song that brings it to and end.



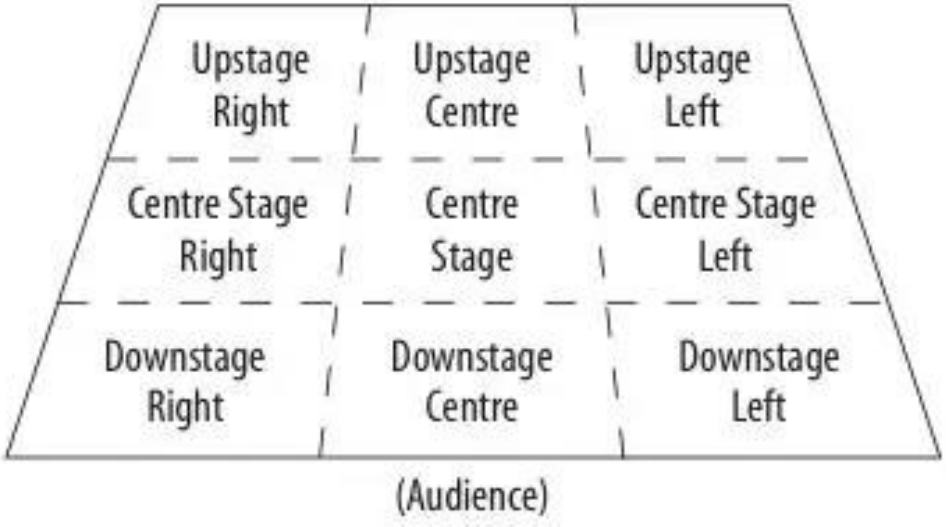
CONJUNCT MELODIC MOTION – Melodies which move mainly by step or use notes which are next to or close to one another.
DISJUNCT MELODIC MOTION – Melodies which move mainly by leap or use notes which are not next to or close to one another.
MELODIC RANGE – The distance between the lowest and highest pitched notes in a melody.



Drama - 'Teechers' and Practitioner 1- Kneehigh

Key Vocabulary	Definitions
Monologue	A speech by one person
Duologue	A conversation between 2 people
Direct address	Character speaks directly to the audience- breaking the 4th wall
Split stage	Where 2 locations are shown on stage concurrently
Multi-roling	Playing more than one role in a performance
Hotseating	Getting to know your character deeper
Stanislavski	Russian theatre practitioner- founder of naturalism
Brecht	German practitioner- believed in theatre to make people think
Boal	Founder of Theatre in Education- theatre of the oppressed
Method acting	Following Stanislavski's teachings to prepare for a role
Naturalism	Creating theatre and characters as close to real-life as possible





Drama - Practitioner 2- Frantic Assembly and Film Making

Genres



Storyboarding

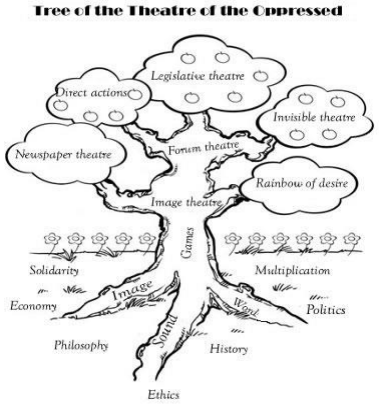


Film Vocabulary	Frantic Assembly techniques
Close- up shot	Building blocks
Medium shot	Bounces
Over the shoulder shot	Round-by-through
PoV shot (Point of view)	Picking ooze
Establishing shot	Hymn hands
Zoom	Lifts
Pan	The rock
Tracking	Select/ delete

Key terminology	
Soliloquy	Speaking when alone on stage- ones own thoughts aloud
Protagonist	The leading character
Antagonist	The villain of the piece
Titular character	The title of the play is also the

Shakespearean dictionary	
Thee/ thy/ thou- you	Hast- have
Wherefore- why	Doth- does
Art- are	Twas- it was
‘tis- it is	Dost- do





DRAMA TARGETS

The Trafalgar School DOWNTON

- ☐ I can cooperate
- ☐ I can perform confidently – taking an equal share of the lines and actions
- ☐ I can work with everyone
- ☐ I can lead
- ☐ I can use my voice to create a character
- ☐ I can compromise
- ☐ I can project my voice
- ☐ I can stay in role (no corpsing)
- ☐ I can stay focused on the task
- ☐ I can come up with and share creative ideas
- ☐ I can use Drama terminology accurately
- ☐ I can verbally evaluate my own and others’ work (support and suggest)
- ☐ I can use my physicality to create a role

Nutrient	Role in the body
Macronutrients	Needed by the body in large amounts.
Micronutrients	Needed by the body in small amounts.
Carbohydrate	The main source of energy for the body.
Protein	Provides the body with growth and repair.
Fat	Provides the body with insulation and a small amount protects vital organs. Provides essential fatty acids for the body.
A	Helps to keep the eyes healthy and strengthen the immune system.
B	Helps to release the energy from the food we eat.
C	Help with skin healing and healthy skin. Help with the absorption of Iron.
D	Important for absorbing calcium and help with healthy bone structure
Mineral	**Role in the body**
Calcium	Important for strong teeth and bones. It also helps with blood clotting.
Iron	Needed for red blood cells which help to transport oxygen around the body.

Hygiene

Personal

Hair up – Reduces the risk of bacteria transferring to food through hair dropping in

Aprons on – Protects you from spillages and reduces risk of bacteria transferring to food from everyday clothing

Washing hands - regularly using hot soapy water to reduce the bacteria on your hands

Blue plasters – Blue plasters should be used to cover cuts and grazes as they will be easily seen if they accidentally fall into food.

Food – Understanding the 4 C's Concept

Cooking – thorough cooking kills bacteria so ensure food is cooked to 75°c to make sure all bacteria are killed – check this by using a food probe.

Cleaning – effective cleaning removes harmful bacteria and stops them spreading so ensure all work tops, utensils and equipment are cleaned thoroughly with hot soapy water.

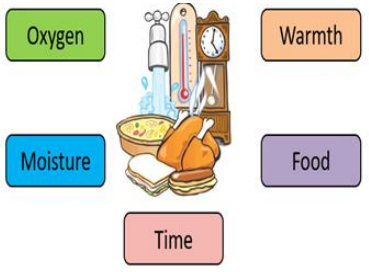
Cooling – effective chilling prevents harmful bacteria multiplying so ensure all food is stored at the correct temperatures, ensure cooked food is cooled within 90 minutes.

Cross contamination – Good hygiene practice prevents Cross contamination so when raw food comes into contact with ready to eat food. For example raw meat juices spilling onto salad.

Food Poisoning

Living organisms (including bacteria) need certain "things" or conditions to survive:





Allergies...

... are immune system reactions.
Symptoms of a reaction can include:

- Itchy mouth
- Vomiting
- Swollen throat
- Red rashes
- Itchy skin
- Swelling

In extreme cases, it can cause *"anaphylactic shock"*

Intolerances

A food intolerance is not the same as a food allergy.
It is not an immune system response.
It is a chemical reaction in the gut.

Initiative

- Cramping gut
- Bloating
- What are some of the symptoms?
- Diarrhoea
- Migraine

Food Styling

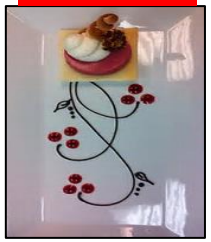
Food styling is where a chef creates a dish and then uses a range of presentation techniques, these can include:

- Different textures
- Different flavours
- Different shapes/colour
- Interesting to look at
- Appetising



smearing

garnishing





drizzling



feathering

Personal Attributes

Hospitality and catering providers will look for certain personal attributes in people who want to work for their business, these can include:

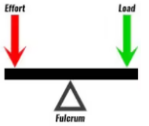
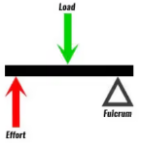
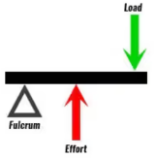
- Patience
- Initiative
- Personal presentation
- Honesty
- Team player
- Self motivation

Key Vocabulary	Definitions
CAD	Computer Aided Design – allows designers to draw, design, plan and model on screen using a computer.
CAM	Computer Aided Manufacture is the manufacturing of products designed using CAD. CAM can create a faster production process.
Automation	The use of technology, machinery or computer-controlled systems to carry out tasks with little or no human involvement.
One off/Bespoke	A product made specifically for an individual customer.
Batch Production	Making a set number of identical products at one time.
Mass Production	Making large quantities of identical products, usually using automated machinery on a Production Line.
Just-In-Time (JIT) Production	Making or ordering products and materials only when they are needed to reduce storage and waste.
Continuous Production	A manufacturing process that produces products continuously, often 24 hours a day, with little or no interruption.
Production Line	A manufacturing system where a product moves through a series of stages, with each worker or machine completing a specific task.
Planned Obsolescence	Designing a product so that it has a limited useful life or becomes outdated, encouraging customers to replace it.

Eyelet Press





Levers		
Levers are simple mechanisms that create mechanical advantage, for example when moving large objects. All levers can be classified into one of three types:		
Class 1	Used when the **direction of movement needs to be changed** or when a mechanical advantage is required e.g. pliers, fabric scissors.	
Class 2	Used to provide **mechanical advantage**, making it easier to move a heavy load e.g. wheelbarrow, eyelet press	
Class 3	Used when **speed and a large range of movement** are more important than mechanical advantage e.g. tweezers, spade.	

Smart Materials	
Smart Materials respond to an external stimulus, such as heat, light, pressure or electricity, by changing their properties.	
Thermochromic pigments	Materials that change colour when their temperature changes.
Photochromic pigments	Materials that change colour when exposed to UV light.
Shape Memory Alloy (Nitinol)	Metals that return to their original shape when heated.
Hydrochromic	Materials that change colour when they come into contact with water.
Hydrophobic	Materials that repel water, causing it to bead up rather than soak in.
Photoluminescence	The ability of a material to absorb light energy and then emit it as visible light.

Composite Materials	
Composite Materials are made by **combining two or more different materials** to create improved properties.	
Concrete	Cement combined with aggregates such as sand and gravel.
Plywood	Layers of wood veneer bonded together.
Fibre/Carbon/Glass	Loose or woven fibres combined with a resin to create a strong, lightweight material.
Reinforced Polymers	Phenolic resins are combined with cotton fabrics to make inflammable laminated plastic sheets, rods and tubes.

Technical Textiles	
Technical Textiles are designed and manufactured for a **specific technical or functional purpose**, rather than mainly for appearance.	
Gore-Tex	A waterproof, windproof and breathable membrane used in clothing and outdoor products.
Aramid (Kevlar)	A strong, lightweight synthetic fibre with high tensile strength, used for protective clothing and equipment.
Geo-Textiles	Technical textiles used in civil engineering where soil or rock needs to be stabilised, filtered, drained or reinforced.
Agro-Textiles	Technical textiles used in agriculture and horticulture to protect crops, control growing conditions or support plants.

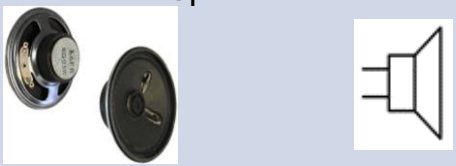
Design and Technology Timbers

Components

Resistor



Speaker



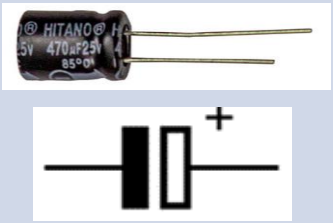
Ceramic capacitor



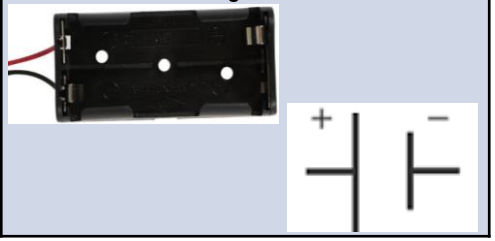
Printed circuit board



Electrolytic capacitor

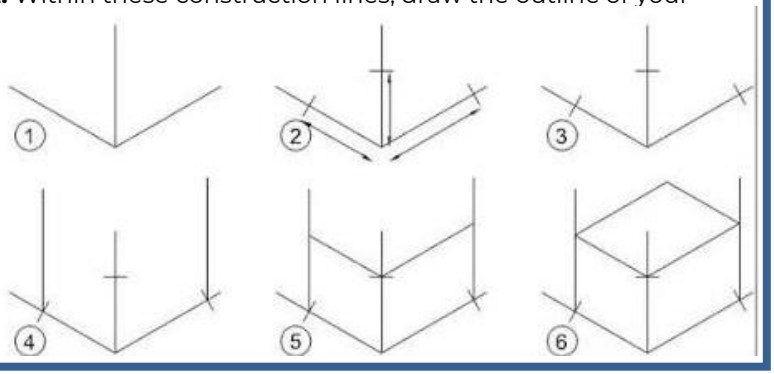


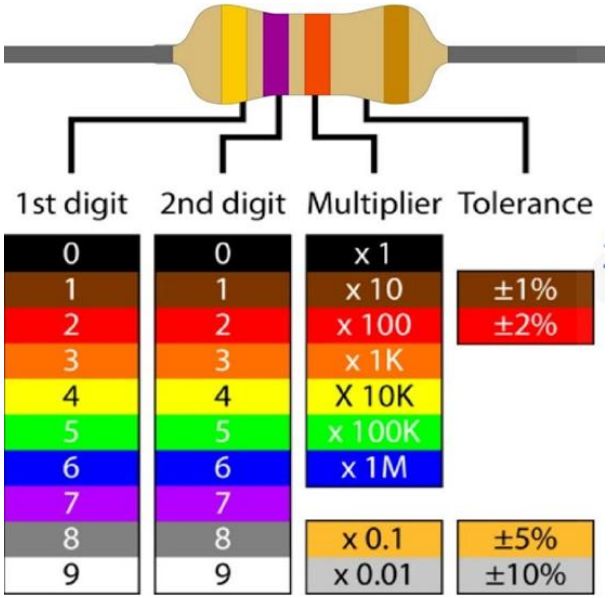
Battery holder



Isometric drawing

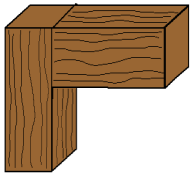
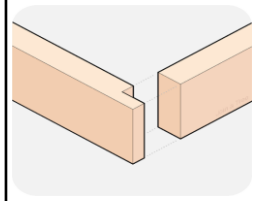
Start with the vertical edge: Instead of drawing the 2D front view (as in oblique drawing), begin with an edge of the product and draw this as a vertical straight line.
Add 30-degree construction lines: From this initial vertical line, create **construction lines** going off at 30-degree angles.
Draw vertical lines: Fill in the next set of vertical lines.
Repeat construction lines: From these new vertical lines, draw your next construction lines going off at 30 degrees
Outline the final product: Within these construction lines, draw the outline of your completed product.

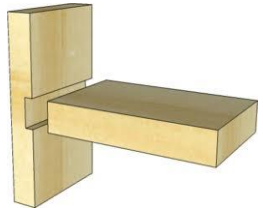
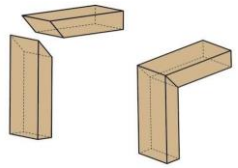
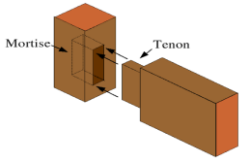
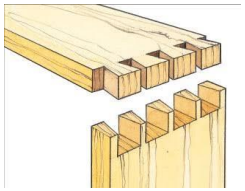




1.Insert Component Place part flat against PCB. Check polarity/orientation and bend legs outwards to hold secure.	**5. Apply Solder** Feed solder into heated joint (not directly onto iron tip) until a neat volcano cone forms.
2. Clean Soldering Iron Wipe heated tip on brass cleaner or damp sponge to remove oxidized old solder layer.	**6. Stop Soldering** Remove solder wire first, then immediately lift soldering iron cleanly away from pad.
3. Pickup Tools Hold soldering iron in dominant hand like a pen; hold solder wire firmly in the other.	**7. Trim Excess Lead** Allow joint to cool for 5s, then trim excess wire leg just above solder peak with wire cutters.
4. Heat Joint Pad Touch iron tip simultaneously to copper board pad and component leg for 2–3 seconds.	**8. Repeat Process** Repeat steps 1–7 systematically for all remaining electronic components on circuit board.

Design and Technology Timbers

Name	Advantages	Disadvantages	
Butt Joint	Easy to make; it is just square ends glued together	Weak, as there is no mechanical strength (just the glue); not aesthetically pleasing	
Dowel Joint	Automated machines can drill the dowel holes quickly and accurately	Hard to line up the dowels accurately by hand	
Lap Joint	Quite easy to cut	Not very strong	

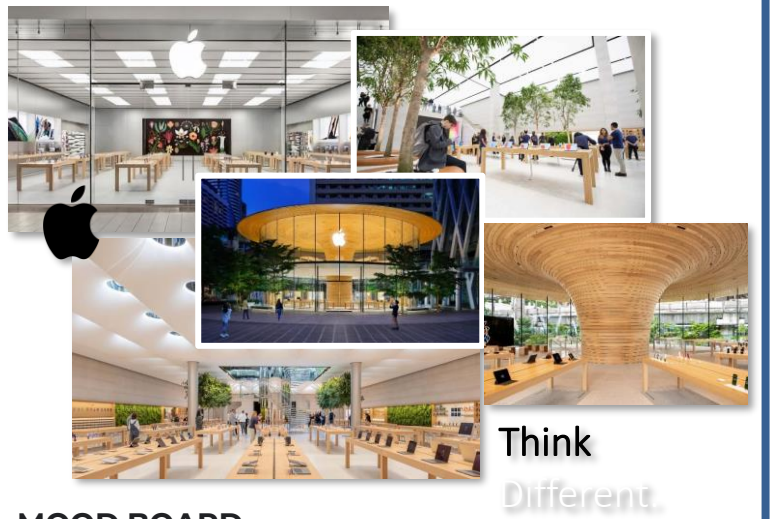
Housing Joint	Holds a shelf or divider securely in the middle of a carcass (frame); pairs well with corner lap joints	Can be tricky to cut neatly on a wide board; requires very accurate marking out and cutting to ensure a shelf is exactly level	
Mitre Joint	Looks good because no end grain shows; good for picture frames	Looks good because no end grain shows; good for picture frames	
Mortise and Tenon Joint	A strong joint; good for joining a table or chair frame to legs	Time-consuming to cut by hand	
Dovetail Joint	A very strong joint where the dovetails lock together securely; good for a drawer front that will get pulled hard	Very tricky to cut accurately by hand	

Finish	Description	Advantages	Disadvantages
Paint	Coloured liquid pigment drying to opaque layer.	Wide range of colours & sheen levels.	Covers and hides natural grain.
Stain	Coloured liquid soaks into wood grain surface.	Makes pale wood mimic rich oak/mahogany.	Original grain still shows underneath.
Varnish	Clear tough coating drying to shine.	Hardwearing gloss/matte grain protection.	Can scratch or chip over time.
Wax	Soft solid rubbed into timber surface.	Easy application, natural matte feel.	Rubs away, needs regular reapplication.
Oil	Penetrating oil rubbed in to soak deep.	Waterproof; non-toxic vegetable oil for kitchens.	Surface feels oily to touch.
Shellac	Beetle resin liquid polished in layers (French polish).	High glossy lustre for fine furniture.	Damaged easily by heat & water.
Veneer	Thin decorative hardwood glued to cheap timber.	Gives luxury appearance at low cost.	Requires protective clear top finish.

Key Vocabulary	Definitions
Design Process	An approach for breaking down a large project into manageable chunks.
Target Audience	A particular group at which a product is aimed towards.
Design Brief	Outlines the specifics of a design project which can include the design project overview, timelines, target audience information, and budget.
Research	A collection of new knowledge and/or the use of existing knowledge in a new and creative way so as to generate new concepts and understandings.
Colour Theory	The collection of rules and guidelines which designers use to communicate with users through appealing colour schemes in visual interfaces.
Evaluation	Is a process that critically examines a design.
Modelling	Making a model allows designers to visualise and test how a product looks and performs in 3D and is a great way of checking a product's viability.
Customer Flow	Customer flow is the way customers move through a business, from entering or starting their visit to leaving or completing a purchase.

Definition of Retail Interior Design

Retail interior design is the process of planning and designing the interior spaces of shops and commercial stores to create an attractive, functional, and engaging environment for customers. It involves the arrangement of space, lighting, colours, materials, furniture, displays, signage, and product placement to support the brand identity and encourage customer interaction and purchasing.



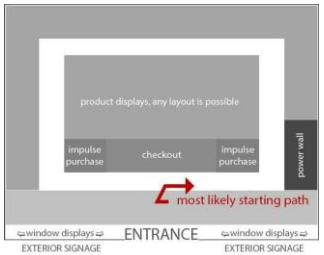
MOOD BOARD

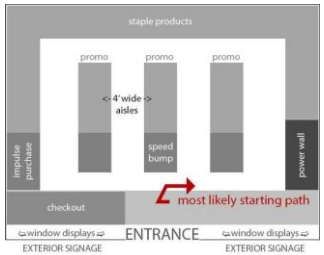
A mood board is a visual representation of ideas for a design project. At its most basic, a mood board is a collage of images. The purpose of a mood board is to help explore ideas and figure out the general style, mood, colours, and overall feel of a room or project space.

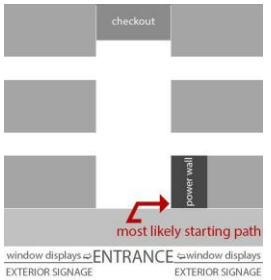
Design Equipment

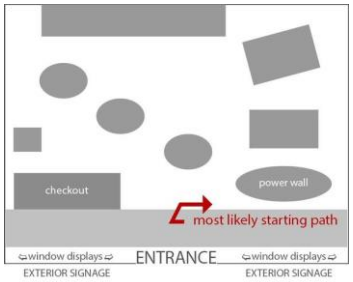
	A **cutting mat** is a protective, flat surface used when cutting materials such as paper, fabric, card, leather, or vinyl with a craft knife or rotary cutter.
	A **safety knife** is a hand-held cutting tool designed with protective features to minimise the risk of injury during cutting tasks.
	A **metal safety ruler** is a durable measuring and cutting guide with a safety edge designed to protect fingers while producing accurate, straight cuts.
	A **hot glue gun** is a handhold tool used in design and craft work to melt and apply glue for joining materials together. It heats a solid glue stick until it becomes liquid, which is then pushed through the nozzle and allowed to cool and harden.
	**Fine liner pens** are drawing and writing tools with a thin, precise fibre or plastic tip that produces a consistent line. In design, they are commonly used for technical drawing, sketching, outlining, detailing, and adding fine textures.
	**French curves** are drawing tools made of thin, curved templates used in design and technical drawing to create smooth, accurate curves that are difficult to draw using a compass or ruler.
	A **scale ruler** is a specialized measuring tool marked with multiple proportional ratios that lets you read or draw dimensions at a fraction of their actual size

CUSTOMER FLOW







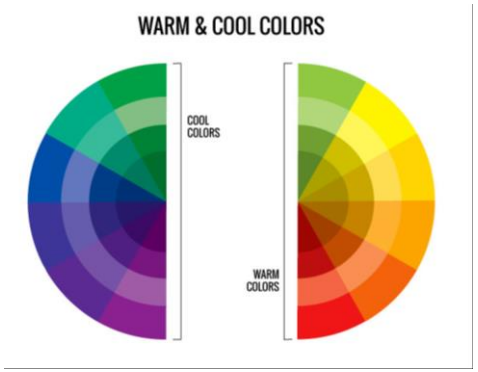


Customer flow is the movement of customers around a store. Providing more check-outs increased customer flow, reduced bottlenecks and improved sales.

COLOUR THEORY

Interior designers use the colour wheel to help choose colours that look good together:

- Opposite colours → create contrast.
- Colours next to each other → create a calm, matching look.
- Different shades of one colour → create a simple, balanced room.
- Warm colours → make a room feel cosy.
- Cool colours → make a room feel calm.



2 Point Perspective – Design a Shop Display Cabinet

Follow these steps to draw and design a display cabinet using 2 point perspective.

Think about how it will look in a real shop – what will you display? What materials and details will you include?

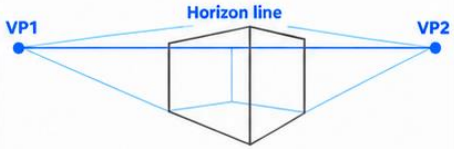
1 Draw the horizon line and vanishing points

Draw a horizontal line across your page (the horizon line). Add two vanishing points (VP1 and VP2) at opposite sides of the page.



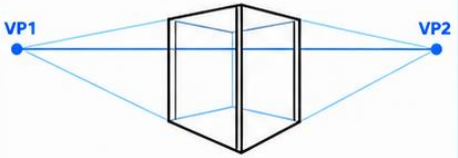
2 Draw the basic shape

Lightly draw a box for the cabinet using the vanishing points. Start with the top and bottom rectangles, then connect the vertical edges.



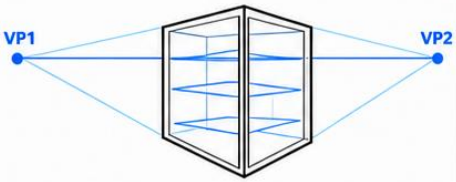
3 Add the front and side edges

Draw the front face of the cabinet. Then add the side edges, keeping them parallel to the vanishing points.



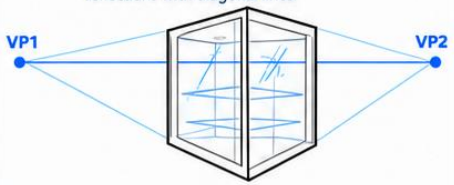
4 Add shelves

Draw the shelves inside the cabinet. Keep the edges parallel to the vanishing points so they stay in perspective.



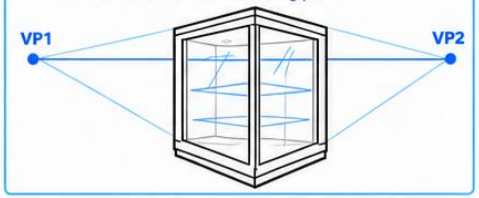
5 Add the glass panels

Draw the front glass panel and side glass panels. Use lighter lines for the glass edges. You can show reflections with diagonal lines.



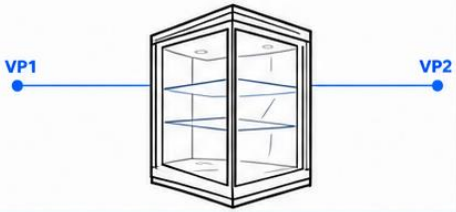
6 Add details

Draw the frame, base, top panel and any handles or fixtures. Add thickness to the frame. Keep all lines consistent with the vanishing points.



7 Clean up your drawing

Go over your final lines with a darker pencil or pen. Erase any extra lines and check your perspective.



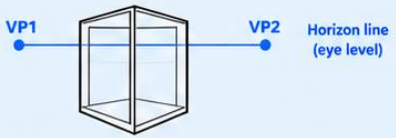
8 Add colour and shading

Use coloured pencils or markers to bring your design to life. Add shadows and highlights to show materials (e.g. wood, glass, metal).



Key things to remember:

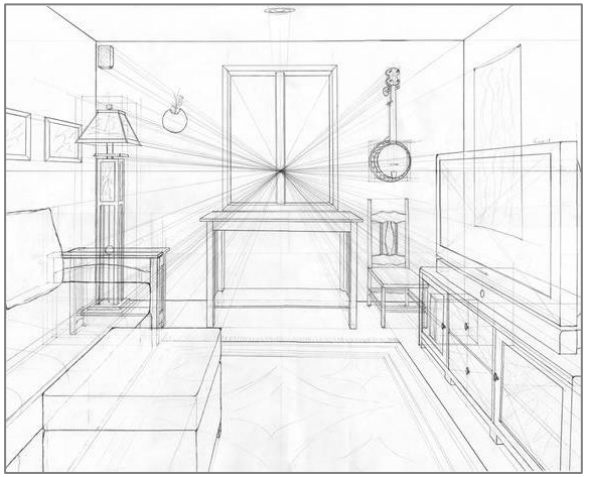
- Use two vanishing points (one on each side of the horizon line).
- Keep vertical lines vertical.
- Horizontal lines always go to the vanishing points.
- The horizon line is at your eye level.
- Use light construction lines first, then darker final lines.

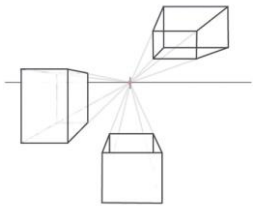


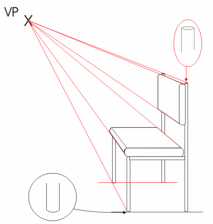
Design tips:

- Think about what will be displayed (e.g. books, shoes, electronics, gifts).
- Consider materials (wood, glass, metal).
- Add useful features like lights, doors or drawers.
- Keep your design neat, labelled and clear.

3D Drawing Techniques







ONE POINT PERSPECTIVE

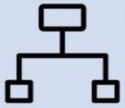
One point perspective is a drawing method that shows how things appear to get smaller as they get further away, converging towards a single 'vanishing point' on the horizon line. It is a way of drawing objects upon a flat piece of paper (or other drawing surface) so that they look three-dimensional and realistic.

Your Knowledge Organiser is a vital document. It contains all the key things from your lessons that you will need to work on committing to your long-term memory.

Here are some useful methods to use that will help commit the information to your long-term memory

The Trafalgar School AT DOWNTON

How to use a knowledge organiser – step by step guide

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