The Knowledge Organisers Pack 2022

Year 11

ATHERTON
HIGH SCHOOL

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MACBETH knowledge organiser

PLOT SUMMARY BY ACT

Act 1	The play opens with three witches chanting on a bleak moorland. In the next scene we hear a battle report in which a soldier Macbeth bravely fought in a battle to defend Scotland. On a bleak Scottish moorland, Macbeth and Banquo, two of King Duncan's generals, discover three strange women (witches). The witches prophesy that Macbeth will be promoted twice: to Thane of Cawdor and King of Scotland. Banquo's descendants will be kings, but Banquo isn't promised any kingdom himself. Macbeth and Banquo want to know more, but the "weird sisters" disappear. Soon afterwards, King Duncan names Macbeth Thane of Cawdor as a reward for his success in the recent battles. The promotion seems to support the prophecy. The King then proposes to make a brief visit that night to Macbeth's castle. Lady Macbeth receives news from her husband about the prophecy and his new title. She vows to help him become king by whatever means are necessary...
Act 2	Macbeth returns to his castle, followed almost immediately by King Duncan. The Macbeths plot together to kill Duncan and wait until everyone is asleep. At the agreed time, Lady Macbeth gives the guards drugged wine so Macbeth can enter and kill the King. He regrets this almost immediately, but his wife reassures him. She leaves the bloody daggers by the dead king just before Macduff arrives. When Macduff discovers the murder, Macbeth kills the drunken guards in a show of rage and retribution. Duncan's sons, Malcolm and Donalbain, flee, fearing for their own lives; but they are, nevertheless, blamed for the mur-
Act 3	Macbeth becomes King of Scotland but is plagued by feelings of insecurity. He remembers the prophecy that Banquo's descendants will inherit the throne and arranges for Banquo and his son Fleance to be killed. In the darkness, Banquo is murdered, but his son escapes the assassins. At his state banquet that night, Macbeth sees the ghost of Banquo and worries the courtiers with his mad response. Lady Macbeth dismisses the court and unsuccessfully tries to calm her husband.
Act 4	Macbeth seeks out the witches who say that he will be safe until a local wood, Birnam Wood, marches into battle against him. He also need not fear anyone born of woman. They also prophesy that the Scottish succession will still come from Banquo's son. Macbeth embarks on a reign of terror, slaughtering many, including Macduff's family. Macduff had gone to seek Malcolm (one of Duncan's sons who fled) at the court of the English king. Malcolm is young and unsure of himself, but Macduff, pained with grief, persuades him to lead an army against Macbeth.
Act 5	Macbeth feels safe in his remote castle at Dunsinane until he is told that Birnam Wood is moving towards him. Malcolm's army is carrying branches from the forest as camouflage for their assault on Macbeth's stronghold. Meanwhile, an overwrought and guilty Lady Macbeth walks in her sleep and tells her secrets to her doctor. She commits suicide. As the final battle commences, Macbeth hears of Lady Macbeth's suicide. In the midst of a losing battle, Macduff challenges Macbeth. Macbeth learns Macduff is the child of a caesarean birth (loophole!), realises he is doomed, and submits to his enemy. Macduff triumphs and brings the head of the traitor Macbeth to Malcolm. Malcolm declares peace and goes to Scone to be crowned king.

EXAMPLE EXAM QUESTIONS

1. Starting with this speech, explore how Shakespeare presents ambition in Macbeth.
2. Starting with this moment in the play, explore how Shakespeare presents the attitudes of Macbeth and Banquo towards the supernatural.
3. Starting with this speech, explore how far Shakespeare presents Macbeth as a violent character.
4. Starting with this speech, explore how far Shakespeare presents Lady Macbeth as a powerful character.
5. Starting with this speech, explore how Shakespeare presents the differences between appearance and reality in Macbeth.

USEFUL EXAM PHRASES

Shakespeare presents... / shows... / hints... / creates... / uses ...
Through the character of... Shakespeare shows / explores / questions...
Shakespeare challenges the belief that...
Shakespeare asks his reader to question / consider...
Shakespeare reinforces this idea earlier / later in the play when...
Shakespeare sends a clear message to his audience...

MACBETH knowledge organiser

KEY VOCABULARY
dramatic irony
Hamartia (fatal flaw)
Hubris (excessive pride/ ego)
tragic hero
remorse / remorseful
paranoia / paranoid
deception / deceive
role reversal
betrayal / betray
manipulation / manipulate
courage / courageous
nihilism / nihilistic
inevitability / inevitable
equivocal/equivocator
Machiavellian
tyrant/ tyrannical/ tyranny
supernatural
treason/treachery
valiant
malevolent
macabre
Natural order
regicide
duplicity
soliloquy
catharsis

KEY THEMES

Ambition —Despite being a loyal and brave soldier at the beginning of the play, Macbeth can not resist the power of his ambition (his fatal flaw). Lady Macbeth's ambition also knows no bounds. Both characters are willing to disobey God to fulfil their ambitions. But consider where ambition leads these characters...

Appearance and Reality - Shakespeare introduces this theme immediately when the Witches chant 'Fair is foul and foul is fair' in the very first scene. This is a play where people's outward appearances cannot be trusted. What might initially appear good, often turns out to be evil...

Guilt— Both Macbeth and Lady Macbeth are plagued by guilt after the regicide. As a result of this, the mental stability of both characters suffers a dramatic decline. Lady Macbeth grossly underestimates the power of guilt and is made to pay for this with her life. In the play the motif of blood represents guilt.

Power—The battle for power can be seen throughout the play. Arguably, some of the most powerful characters are female: Lady Macbeth and the Witches. Both forces are able to manipulate the play's protagonist: Macbeth. However, the power of God cannot be ignored. Are Macbeth and Lady Macbeth punished for committing regicide (a sin against God)?

Chaos and Disorder— At the beginning of the play, everything is in order. However, when Divine Right is challenged, with the murder of King James, the balance of The Great Chain of Being is offset. The play's events that succeed the regicide are marked by chaos and disorder, be it the mental state of the play's protagonists: Macbeth and Lady Macbeth; the state of Scotland or the weather / nature. Order is only restored at the very end of the play when the King is returned to its rightful owner: Malcolm (the eldest son of Duncan).

KEY QUOTATIONS

'Look like the innocent flower but be the serpent underneath it'	'A little water clears us of this deed' 'Tis the eye of childhood that fears a painted devil'	'Out, damn spot!' 'The Thane of Fife had a wife' 'Hell is murky'
'O full of scorpions is my mind, dear wife'	'Be innocent of the knowledge, dearest chuck, until thou applaud the deed'	'Amen stuck in my throat'
'Fair is foul and foul is fair;' 'So foul and fair a day I have not seen'	'Pour my spirits in thine ear' 'come you sprits...unsex me here'	'Tomorrow and tomorrow and tomorrow'
'I will try the last' 'I have no spur to prick the sides of my intent., only vaulting ambition'	'Life is a tale told by an idiot signifying nothing'	"This dead butcher and his fiend-like queen'
'To be thus is mothing but to be safely thus'	'Unseam'd him from the nave to the chaps' 'smoked with bloody execution'	'Stars hide your fires, let not light see my black and deep desires'
'Some say the Earth was feverous and did shake'	'Would all great Neptune's ocean wash this blood from my hands?'	'I am in blood, stepped in so far...'
'My way of life is fall'n into the sear—the yellow leaf'	'All the perfumes of Arabia will not sweeten this little hand'	'Macbeth has murdered sleep' 'Look on it again, I dare not'

ALGEBRAIC TECHNIQUES...

Sequences

What do I need to be able to do?

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

- Generate a sequence from term to term or position to term rules
- Recognise arithmetic sequences and find the nth term
- Recognise geometric sequences and other sequences that arise

Keywords

Sequence: items or numbers put in a pre-decided order
Term: a single number or variable
Position: the place something is located
Linear: the difference between terms increases or decreases (+ or -) by a constant value each time
Non-linear: the difference between terms increases or decreases in different amounts, or by x or ÷
Difference: the gap between two terms
Arithmetic: a sequence where the difference between the terms is constant
Geometric: a sequence where each term is found by multiplying the previous one by a fixed non zero number

Linear and Non Linear Sequences

Linear Sequences – increase by addition or subtraction and the same amount each time

Non-linear Sequences – do not increase by a constant amount – quadratic, geometric and Fibonacci

- Do not plot as straight lines when modelled graphically
- The differences between terms can be found by addition, subtraction, multiplication or division

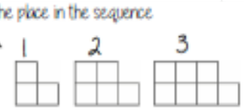
Fibonacci Sequence – look out for this type of sequence

0 1 1 2 3 5 8 ...

Each term is the sum of the previous two terms

Sequence in a table and graphically

Position: the place in the sequence



"The term in position 3 has 7 squares"

3 5 7

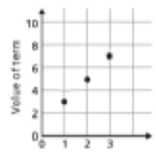
Term: the number or variable (the number of squares in each image)

In a table

Position	1	2	3
Term	3	5	7

+2 +2

Graphically



Because the terms increase by the same addition each time this is **linear** – as seen in the graph

Sequences from algebraic rules

This is substitution!

$3n + 7$ — This will be linear - note the single power of n. The values increase at a constant rate

$3n^2 + 7$ — This is not linear as there is a power for n

$2n - 5$ → Substitute the number of the term you are looking for in place of 'n'

e.g
1st term = 2 (1) – 5 = -3
2nd term = 2 (2) – 5 = -1
100th term = 2 (100) – 5 = 195

Checking for a term in a sequence

Form an equation

Is 201 in the sequence $3n - 4$?

$3n - 4 = 201$ ← Term to check; Algebraic rule

Solving this will find the position of the term in the sequence. ONLY an integer solution can be in the sequence.

Complex algebraic rules

Misconceptions and comparisons

$2n^2$ — 2 times whatever n squared is

e.g
1st term = 2 x 1^2 = 2
2nd term = 2 x 2^2 = 8
100th term = 2 x 100^2 = 2000

$(2n)^2$ — 2 times n then square the answer

e.g
1st term = $(2 \times 1)^2$ = 4
2nd term = $(2 \times 2)^2$ = 16
100th term = $(2 \times 100)^2$ = 40000

$n(n + 5)$ ←

e.g
1st term = 1 (1 + 5) = 6
2nd term = 2 (2 + 5) = 14
100th term = 100 (100 + 5) = 10500

You don't need to expand the expression

H Finding the algebraic rule

This is the 4 times table: 4, 8, 12, 16, 20....

$4n$

7, 11, 15, 19, 22 ← This has the same constant difference – but is 3 more than the original sequence

$4n + 3$

This is the constant difference between the terms in the sequence

This is the comparison (difference) between the original and new sequence

Representing solutions of equations and inequalities

What do I need to be able to do?

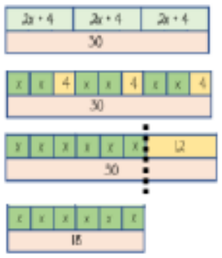
By the end of this unit you should be able to:

- Form and solve equations and inequalities
- Represent and interpret solutions on a number line as inequalities
- Draw straight line graphs and find solutions to equations
- Form and solve equations and inequalities with unknowns on both sides

Keywords

Solution: a value we can put in place of a variable that makes the equation true
Variable: a symbol for a number we don't know yet
Equation: an equation says that two things are equal – it will have an equals sign =
Expression: numbers, symbols and operators grouped together to show the value of something
Identity: An equation where both sides have variables that cause the same answer includes ≡
Linear: an equation or function that is the equation of a straight line
Intersection: the point that two lines meet
Inequality: an inequality compares two values showing if one is greater than, less than or equal to another

Solve equations R



3 (2x + 4) = 30

3 (2x + 4) = 30
Expand the brackets
6x + 12 = 30
-12 -12
Substitute to check your answer. This could be negative or a fraction or decimal
6x = 18
÷6 ÷6
x = 3

Form and solve inequalities R

Two more than treble my number is greater than 11

Form

x → ×3 → +2 → 11

$3x + 2 > 11$

Solve

x ← -3 ← -2 ← 11

$x > 3$

Solutions on a number line

$x < 1$ $x \leq 1$

Both represent values less than 1

Includes the value 1

$x > 1$ $x \geq 1$

Both represent values more than 1

Includes the value 1

● Includes the value it sits above
○ Does NOT include the value it sits above

Values less than or equal to 3 but also more than -1

$-1 < x \leq 3$

This includes the integer values 0, 1, 2, 3

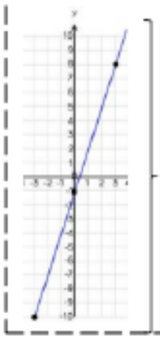
Plotting straight line graphs R

$y = 3x - 1$ → 3 x the x coordinate, then – 1

x	-5	0	5
y	-10	-1	8

Draw a table to display the information

This represents a coordinate pair (-5, -10)



You only need two points to form a straight line

Plotting more points helps you decide if your calculations are correct. (if they do make a straight line)

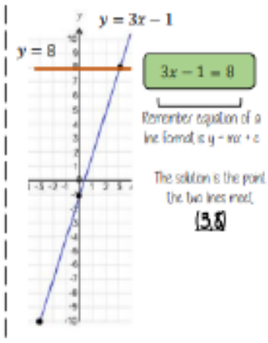
Remember to join the points to make a line

Find solutions graphically

For linear equations there is only one point the graph meets the x value.

$x = 2$
$y = 4$

These two lines will cross at (2,4) because they are just x= and y= they are parallel to axes and meet in one place



$3x - 1 = 8$

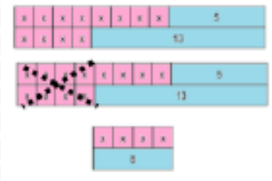
Remember equation of a line format is y = mx + c

The solution is the point the two lines meet.

(3,8)

Equations: unknown on both sides R

$8x + 5 = 4x + 13$



$8x + 5 = 4x + 13$
$-4x \quad -4x$
$4x + 5 = 13$
$-5 \quad -5$
$4x = 8$
$\div 4 \quad \div 4$
$x = 2$

Inequalities: unknown on both sides

$8x + 5 \leq 4x + 13$ → $x \leq 2$

Only value 2 or less will satisfy this inequality

Working in the Cartesian plane

What do I need to be able to do?

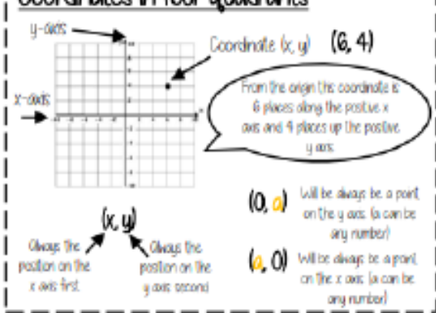
By the end of this unit you should be able to:

- Label and identify lines parallel to the axes
- Recognise and use basic straight lines
- Identify positive and negative gradients
- Link linear graphs to sequences
- Plot y = mx + c graphs

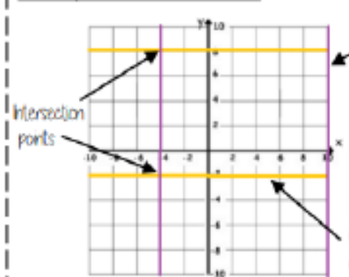
Keywords

Quadrant: four quarters of the coordinate plane
Coordinate: a set of values that show an exact position
Horizontal: a straight line from left to right (parallel to the x axis)
Vertical: a straight line from top to bottom (parallel to the y axis)
Origin: (0,0) on a graph. The point the two axes cross
Parallel: Lines that never meet
Gradient: The steepness of a line
Intercept: Where lines cross

Coordinates in four quadrants



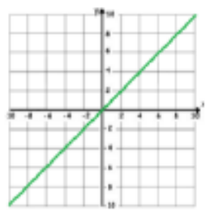
Lines parallel to the axes



Lines parallel to the **y axis** take the form **x = a** and are **vertical**

Lines parallel to the **x axis** take the form **y = a** and are **horizontal**

Recognise and use the line y=x



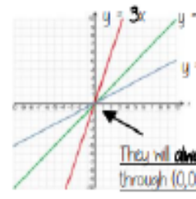
This means the x and the y coordinate have the same value

Examples of coordinates on this line: (0, 0) (-3, -3) (5, 5)

The axes **scale is important** – if the scale is the same y = x will be a straight line at 45°

Recognise and use the lines y=kx

The value of **k** changes the steepness of the line



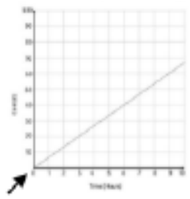
Note: y = x is the same as y = 1x

The bigger the value of k, the **steeper** the line will be

They will **always** go through (0,0)

The closer to 0 the value of k, the closer the line will be to the x axis

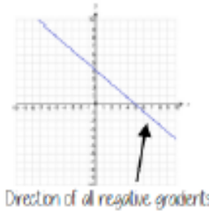
Direct Proportion using y=kx



The line must be straight to be directly proportional – variables increase at the same rate **k**

Direct proportion graphs always start at (0,0) as they are describing relationships between two variables

Lines with negative gradients

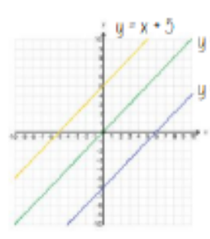


Any straight-line graph with a negative x value has a negative gradient

Eg. y = -2x
y = -x y = x - 12

Direction of all negative gradients

Lines in the form y = x + a



All the lines are **parallel** because the gradients are the same

y = x + a

This is the line y=x when the y and x coordinate are the same

This shows the translation of that line

e.g. y = x + 5 is the line y=x moved 5 places up the graph

5 has been added to each of the x coordinates

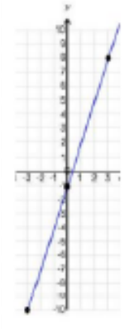
Plotting y = mx + c graphs

y = 3x – 1 → 3 x the x coordinate then – 1

x	-3	0	3
y	-10	-1	8

Draw a table to display this information

This represents a coordinate pair (-3, -10)



You only need two points to form a straight line

Plotting more points helps you decide if your calculations are correct (if they do make a straight line)

Remember to join the points to make a line

Science: GCSE Chemical Analysis

1. Key Words

Pure substance	A substance that contains a single element or compound, not mixed with any other substance
Formulation	A mixture that has been designed for a specific purpose
Melting point	The temperature at which a substance changes from a solid to a liquid
Boiling point	The temperature at which a substance changes from a liquid to a gas

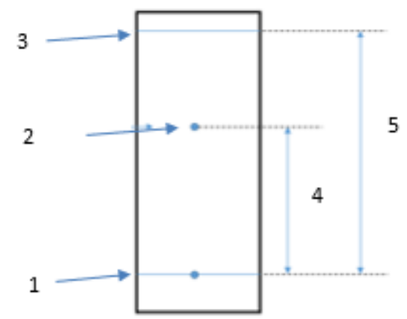
2. Chromatography

This is a separation technique used to separate mixtures in dyes inks, paint and DNA

The R_f value is a measure of how far up the chromatography paper the solute moves compared to the solvent.

R_f equations $= \frac{\text{Distance moved by the solute}}{\text{Distance moved by the solvent}}$

1	Baseline	Pencil line that the solute is placed on
2	Solute	The final position of the solute
3	Solvent front	The final position of the solvent
4	Distance moved by the solute	
5	Distance moved by the solvent	



3. Testing for Gases

Gas	Test	Positive Result
Hydrogen	Place a lit splint into the gas	Squeaky pop noise
Oxygen	Place a glowing splint into the gas	Splint will relight
Carbon dioxide	Bubble the gas through limewater	Limewater will change from colourless to cloudy
Chlorine	Place damp blue litmus paper into the gas	Litmus paper will change colour to pink and then bleach to white

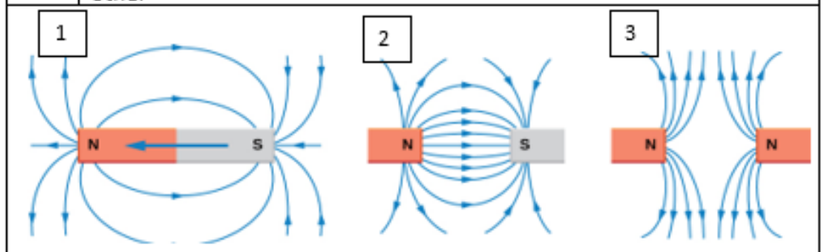
Science: GCSE Magnetism and Electromagnets

1. Key Words

Permanent magnet	A material that is always magnetic
Magnetic field	Area around a magnet where the force of magnetism affects an object
Poles	The ends of a magnet where the magnetic field is the strongest
Electromagnet	A soft metal core made into a magnet by the passage of electric current through a coil surrounding it

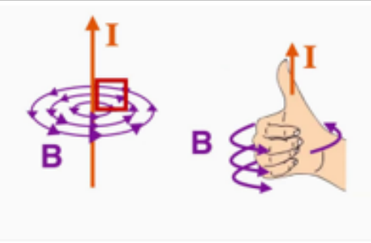
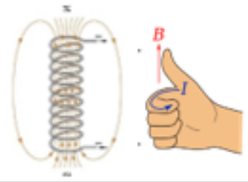
2. Magnetic fields

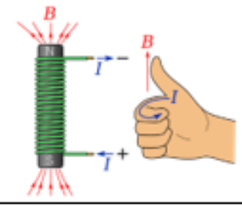
1	Magnetic field of a bar magnet travels from north to south with the strongest field strength at the poles shown by the lines being closer together
2	When opposite poles are placed near each other the magnetic field travels from the north to south poles of each magnet causing a force of attraction
3	When like poles are placed near each other the magnetic field of each magnet repels the other causing the magnets to push away from each other



3. Current-carrying wire

The right hand thumb rule can be used to work out the direction of the magnetic field

Straight wire	I	Direction of current
	B	Direction of magnetic field
		
Solenoid (coiled wire	I	Direction of current
	B	Direction of magnetic field
		

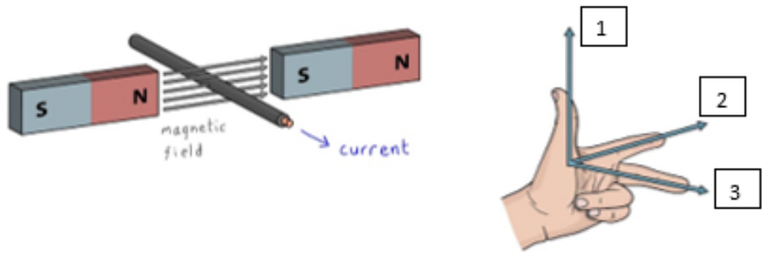
Electromagnet	
Adding an iron core to a solenoid increases the strength of the magnetic field. An electromagnet can be turned on or off.	

4. The Motor Effect – HT only

The motor effect is when a magnet and a current carrying conductor exert a force on each other

Flemings Left Hand Rule

1	Direction of the force
2	Direction of the magnetic field
3	Direction of the current



5. Magnetic Flux Density – HT only

The magnetic flux density is a measure of the total magnetic field passing through an area.

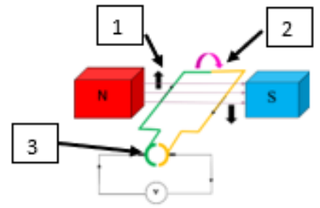
The size of a force on a conductor can be calculated using the following formula

$$F = BIl$$

F	Force in Newton's (N)
B	Magnetic flux density in tesla (T)
I	Current in amps (A)
L	Length in metres (m)

6. Electric Motors – HT only

1	Direction of force
2	Current carrying wire and direction of travel
3	Split-ring commutator



Direct current is passed through the wire → Each side of the coil experiences opposite forces → The coil rotates

Science: GCSE Organic Chemistry

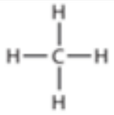
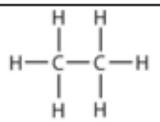
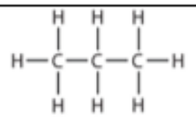
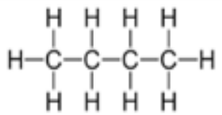
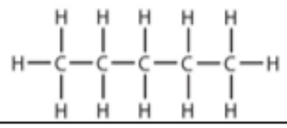
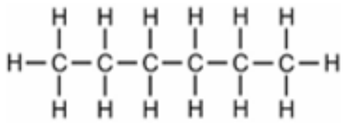
1. Key Words

Hydrocarbon	Compound made up of only carbon and hydrogen atoms
Alkane	Saturated hydrocarbon containing only single bonds between the atoms
Alkene	Unsaturated hydrocarbon containing at least one double bond
Cracking	A process that uses high temperatures and a catalyst to break down long chain alkanes into smaller alkanes and alkenes making more useful products
Fractional Distillation	A process of separating the different chain lengths of hydrocarbons found in crude oil
Crude oil	Fossil fuel made from the remains of dead plants and sea creatures millions of years ago and contains a millions of years ago, containing a mixture of different hydrocarbons

2. Properties of Hydrocarbons

Viscosity	This refers to the thickness of the liquid hydrocarbon. As the length of the hydrocarbon chain increases, the viscosity increases and the liquid compound becomes thicker
Boiling point	This refers to the temperature at which the liquid hydrocarbon changes into a gas. The longer the hydrocarbon chain, the higher the boiling point
Flammable	This refers to how easily the hydrocarbon sets on fire. The smaller the hydrocarbon chain the more flammable it is

3. Alkanes

General Formula	C_nH_{2n+2}	
Alkane name	Alkane formula	Alkane structure
Methane	CH_4	
Ethane	C_2H_6	
Propane	C_3H_8	
Butane	C_4H_{10}	
Pentane	C_5H_{12}	
Hexane	C_6H_{14}	

Science: GCSE Using Resources

1. Key Words

Finite resource	A resource that will eventually run out
Renewable resources	Resources that reform at a similar, or faster, rate that we use them
Life Cycle Assessment (LCA)	An assessment of the environmental impact of a product over each stage of its life
Sustainable development	Meeting the needs of the present society whilst not damaging the lives of future generations

2. Life Cycle Assessments

These are often used to determine the most environmentally viable option in production of a product.

LCA Stage	Plastic bag	Paper bag
Raw Materials	Crude oil	Timber
Manufacturing and packaging	Key components extracted by fractional distillation. Waste has other uses	Takes lots of energy to pulp timber and creates lots of waste
Using the product	Reusable	Single-use
Product disposal	Recyclable, not biodegradable	Biodegradable and recyclable

3. Extracting Copper

Copper is a finite resource that is becoming scarce
Sustainability can be improved by extracting copper from low grade ores

Phytomining	Plants are grown in copper rich soils The plants absorb the copper and levels build up in the leaves Crops are harvested and burned to leave ash containing copper compounds Copper is extracted using a displacement reaction with scrap iron.
Bioleaching	Bacteria are used to convert the copper compounds in the ore into soluble copper compounds The copper is then extracted using electrolysis

4. Recycling

Recycling helps to save on the large amounts of energy required to extract and process natural resources.

Material	Process	Extra Info
Recycling metals	Waste metals are melted down and recast into new products	Amount of separation required for the recyclable metal depends on the metal and the final product
Recycling glass	Waste glass is separated in to colours, crushed and melted This is then reshaped in to new products	Glass bottles can also be washed and sterilised and used again instead of recycling them

5. Treating Water

Key Word	Definition
Potable water	Water that is safe to drink
Pure water	Water that contains only water molecules
Ground water	Water from underground rocks and rain

Treating ground water to produce potable water:

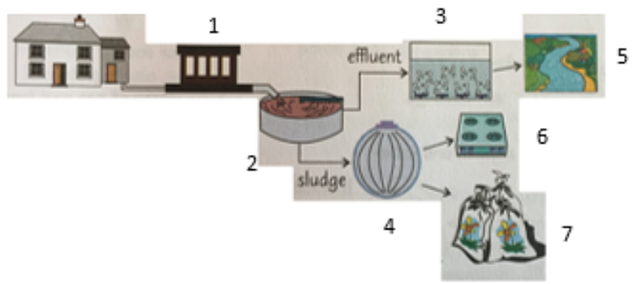
1	Passed through a mesh that removes larger debris such as twigs and stones
2	Passed through a filter to remove any smaller solid bits
3	Water is sterilised to kill off any harmful microbes using chlorine, ozone or UV light

There are two methods of treating salt water to produce potable water:

Distillation	Reverse osmosis
Water is boiled and the condensed to remove the salt	The water is passed through a membrane that only allows water molecules through

6. Waste Water Treatment

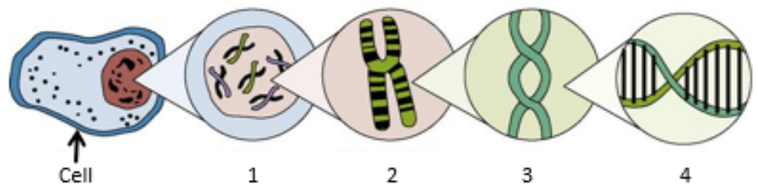
1	Screening	Large waste products are removed such as paper
2	Sedimentation	Tiny particles settle to the bottom of a still tank that then splits in to two sections effluent and sludge
3	Aerobic digestion of organic matter	The effluent is treated with aerobic bacterial to reduce the volume of solid waste
4	Anaerobic digestion of organic matter	The sludge is digested anaerobically by specific bacteria
5	Released back into the environment	The treated effluent is returned to rivers and water ways
6	Natural gas	Methane gas is produced from the anaerobic digestion of sludge and can be used as a fuel
7	Fertiliser	The remaining sludge is rich in minerals and can be used as a natural fertiliser



Science: GCSE Variation, Inheritance and Evolution

1. DNA

1	Nucleus	Organelle that contains the genetic material
2	Chromosomes	Long molecule of DNA that comes in pairs
3	DNA	Sequence that codes for the
4	Gene	Single section of DNA that is responsible to specific characteristics



2. The Human Genome Project

Genome	The entire sequence of the genetic material in an organism
Human Genome Project	25 year research project that mapped the entire human genome to identify specific locations of the genes each chromosome.

Application	**Advantage**
Genes linked to genetic diseases can be identified	Gives a better understanding of how genetic diseases are inherited, so effective treatments can be developed
Tiny differences in peoples genomes can be studied	Helps to trace migration patterns of past human populations

3. Cell Division in humans

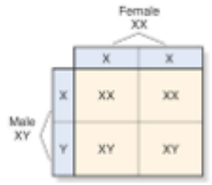
Mitosis	**Meiosis**
Used for growth and repair	Used in the production of gametes
Once cell division per cycle	Two cell divisions per cycle
Daughter cells contain 46 chromosomes	Daughter cells contain 23 chromosomes

4. Key Words

Gamete	Sex cell
Allele	Single gene from a gene pair
Genotype	Coding used for a characteristic
Phenotype	Description of the chearacteristic
Dominant	An allele that is always expressed
Recessive	An allele only expressed when there are 2 recessive genes present
Homozygous	Alleles code for the same characteristic
Heterozygous	Genes code for different characteristics
Sexual reproduction	Fusing of nuclei from gamets, produces variation
Asexual reproduction	One parent, produces genetically identical offspring
Mutation	A random change in the sequence of DNA
Variation	Changes in a population caused by a mutation (differences in phyisical, chemical and behavioural characteristics between organisms or individuals)
Genetic variation	Variation that is caused by the inheritance of alleles of genes
Environmental variation	Variatio that is caused by the effects of environmental factors

Science: GCSE Variation, Inheritance and Evolution

5. Determining Gender

Female Genotype	XX
Male Genotype	XY
Each time an egg is fertilised there is a 50% chance it will be a girl.	

6. Inherited diseases

Cystic Fibrosis	Caused by a recessive gene Affects the cell membrane formation, causing mucus to build up in the lungs and digestive tract
Polydactyly	Caused by a dominant gene Causes an extra digit to grow on the hand or feet

7. Embryo Screening

This is where one cell from an embryo is taken and the DNA is checked for the presence of specific genes

For	Against
It will help prevent people suffering	Screening is expensive
Treating disorders costs the government a lot of money	People might want to screen embryos so they can pick the most 'desirable' trait
There are laws to stop the procedure being misused	Ethical issues as embryos found with genetic disorders are often destroyed (killing potential life)

8. Evolution

The theory of EVOLUTION by NATURAL SELECTION was put forward by Charles Darwin

	Stage	Explanation
1	Variation	There is genetic variation within a population caused by inherited genes
2	Competition	Over production of offspring leads to increased competition
3	Selection	Individuals with beneficial adaptations are more likely to survive to pass on their genes
4	Inheritance	Over many generations there is a change in the allele frequency

Species	A group of organisms that have similar features that can breed to produce fertile offspring

9. Extinction

What is extinction?	When the all the organisms of a species have die and there are none left alive
Causes of extinction	1. NEW disease 2. NEW predator 3. Lack of food 4. Climate change 5. Natural disasters

Science: GCSE Variation, Inheritance and Evolution

10. Fossils

What are fossils?	Remains or imprint of an organism that dies millions of years ago, found in rocks, ice and peat
How do fossils form? (rocks)	1. Organism dies and falls to the ground 2. Layers of sediment over the dead organism 3. Over millions of years, the layers turn to rock and minerals in the rock replace the minerals in the bones of an animal This happens because decay cannot occur.
What information can fossils tell us?	Early life was simple. The evolution of a species can be predicted by looking at differences between the fossils of a species.
Why do we not have fossils for the early life on Earth?	Fossilisation is rare as most organisms decay Fossils can be easily become damaged as the rocks move due to tectonic plates Most early life has soft body forms which do not fossilise

11. Classification

Carl Linnaeus	Developed the system of classification used today
Binomial name	Official name of a species including the genus and species name
3 domain system developed by Carl Woese	All organisms can be classified in to 3 domains • Archaea – ancient simple bacteria, often extremophiles • Prokaryote – bacteria • Eukaryote – complex organisms including animals and plants.

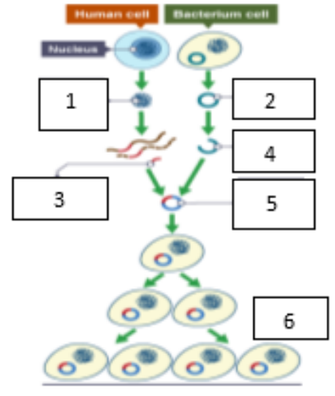
Group	Mnemonic
Kingdom	King
Phylum	Philip
Class	Came
Order	Over
Family	For
Genus	Good
Species	Soup

12. Genetic engineering

Genetic Engineering (Genetic Modification – GM)	Process of inserting the gene of one organism to the DNA of another to change or enhance specific characteristics.
Plasmid	Ring of secondary DNA in a bacteria cell

Genetically engineering insulin using bacteria (HT only)

1	Chromosome containing desired gene is removed
2	Plasmid from a bacteria is removed
3	Enzymes are used to cut the gene from the DNA
4	Enzymes are used to cut out a section of the plasmid DNA
5	The desired gene is inserted in to the plasmid using enzymes
6	The plasmid is placed back into the bacteria, which multiplies rapidly, copying the gene and making insulin



13. Selective Breeding

Process of selecting individuals of the same species with the desired characteristic and breeding them to produce offspring with the desired characteristics	
Benefits of selective breeding	Produce disease resistant crops, increase the yield of milk and meat from cattle, increased growth rate of chickens so meat can be sold earlier, domestication of pets (more attractive and docile) and many more
Concerns of selective breeding	It does not always work and takes a long time. Interbreeding of organisms can cause disease or defects

Method for selective breeding

1.	Select a male and female with the desired characteristics
2.	Breed together
3.	Check the offspring for the desired characteristics
4.	If desired characteristics are present continue to interbreed until the characteristic is always present. If the desired characteristic is not present, go back to step 1.

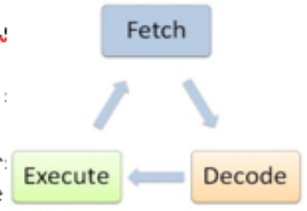
1.1 SYSTEMS ARCHITECTURE

KEY CONCEPTS

- Computer systems take data (input), process it and then output it.
- **Embedded systems** are computers built in to other devices like washing machines. They are dedicated to a single task so they are efficient.
- **Clock speed:** the number of instructions a processor can carry out per/second. Higher clockspeed = faster CPU..
- Number of **Cores:** The more cores a CPU has the more instructions it can carry out at once (multitasking). More cores = faster processing.
- **Cache size:** A larger cache gives the CPU faster access to more data

EXAM QUESTIONS

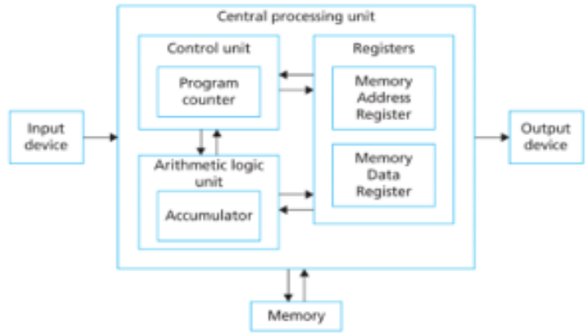
1. Explain how cache size, cores and cl
   performance of the CPU.
2. Define what is meant by an embedded
3. What is the purpose of the ALU?
4. Explain the role of the CPU register
5. Explain how the fetch decode execute
6. Explain four events that occur during the FDE cycle.



FETCH – DECODE – EXECUTE CYCLE

CPU **fetches** instruction from the RAM
(copies memory address to MAR, copies
instruction to MDR & adds 1 to PC.
CU **decodes** the instruction from the MDR
Instruction is **executed** by the CU
The next instructions is fetched and
The cycle repeats.

THE CENTRAL PROCESSING UNIT (CPU)



Control Unit (CU): executes instructions and controls the flow of data in the CPU.

Program counter: holds the memory address for the instruction of each cycle.

Arithmetic Logic Unit (ALU): does all of the calculations and logic operations.

Accumulator: holds the immediate result of any calculations in the ALU.

Cache: very fast memory that stores regularly used data so that the CPU can access it quickly.

MAR (Memory Address Register): holds the address about to be used by the CPU.

MDR (Memory Data Register :) holds the actual data or instruction being processed by the CPU.

1.2 MEMORY and 1.3 STORAGE

RANDOM ACCESS MEMORY (RAM)

- RAM is the computer's main memory that holds the data, programs and files while they are being used.
- RAM is volatile (power off = the data is lost)
- The CPU will fetch instructions from the RAM in the fetch – decode – execute cycle.
- When the RAM is full the computer uses **VIRTUAL MEMORY**. It uses the secondary storage as temporary RAM so that the computer can continue running (but slowly).

READ ONLY MEMORY (ROM)

- The ROM is on a chip build into the motherboard
- It contains the BIOS (boot up sequence for the computer)
- ROM is non-volatile (data still stored after power is off)

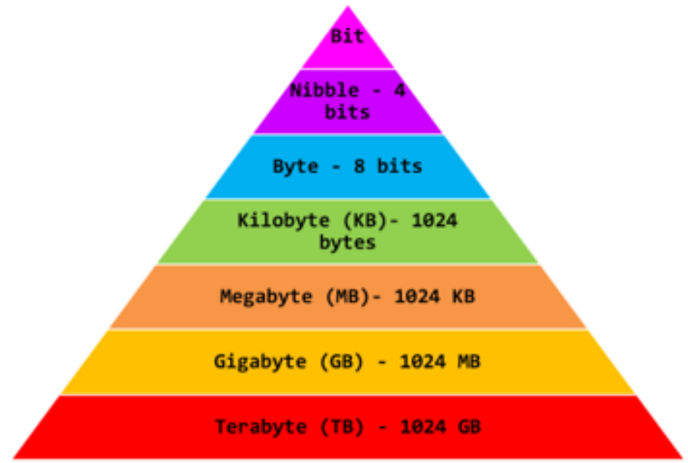
TYPES OF STORAGE

- Secondary Storage: where all data including the programs are stored when they are not being used.

Storage	Key Information
Hard Disk Drive (HDD)	Magnetic, has moving parts, large capacity, lower cost than SSD
Solid State Drive (SSD)	Flash memory, no moving parts, more robust than HDD, faster and more expensive than HDD
Flash memory	Eg: USB memory sticks, memory cards.
Optical Storage	Eg: CDs, DVDs. Cheap, portable and fairly robust.
Magnetic tape	Used for archive storage (back ups). Very large capacity, low cost, slow.

STORAGE CAPACITY

Some storage methods such as a HDD or SSD have a large capacity (they can store lots of data. Other devices such as CDs and SD cards have smaller capacity. Measurements of capacity are shown below:



EXAM QUESTIONS

1. Explain how the RAM works with the CPU in the fetch –decode – execute cycle
2. Explain the difference between volatile and non-volatile memory giving an example of each
3. Tom is buying a new laptop, he is not sure whether to get a magnetic HDD or SSD. Discuss the benefits and drawbacks of each.

1.4 WIRED AND WIRELESS NETWORKS

Key Terms

A network is where devices have been connected together so that they can share data and resources. Networks can be wired (Ethernet) or wireless (WiFi).

Local Area Network (LAN)	Cover a small geographical area such as an office. Use their own infrastructure.
Wide Area Network (WAN)	WANs connect LANs together over a large geographical area and make use of infrastructure from telecommunications companies.
Bandwidth	The amount of data that can pass between network devices per second
Server	A device that provides services for other devices (eg file server or print server)
Client	A computer or workstation that receives information from a central server
Peer to peer Network	All of the computers in the network are equal. They connect directly to each other.
Standalone computers	A computer not connected to a network

NETWORK HARDWARE

Network Interface Controller (NIC): built in hardware that allows a device to connect to a network.
Switches: connect devices on a LAN
Router: Transmits the data (packets) between the networks (eg: the internet and your LAN)
Wireless Access Point (WAP): a switch that allows devices to connect wirelessly.
Cables: the cables in a network can be twisted pair cables, coaxial cables or fibre optic cables.

NETWORK PERFORMANCE

These factors can impact on network performance:
Bandwidth: The more bandwidth, the more data that can be transferred at a time.
Number of Users: Having a lot of people using a network means lots of data is being transmitted which can slow it down.
Transmission Media: Wired connections are faster than wireless. Fibre optic cables are faster than copper cables.
Wireless Factors: wireless can be affected by walls, distance, signal quality and interference from other devices.
Topology: The layout of a network can impact on its performance.

VIRTUAL NETWORKS

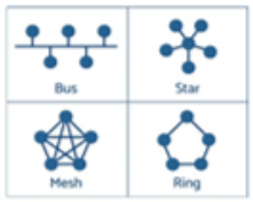
A virtual network is part of a LAN or WAN where only certain devices can "see" and communicate with each other.

EXAM QUESTIONS

1. Give 3 items of hardware needed for a network
2. Explain the difference between a peer-to-peer network and a client server network.
3. The school's network has become very slow. Explain two different reasons why this might be.
4. Evaluate the benefits of using a wired connection rather than a wireless one.

1.5 NETWORK TOPOLOGIES, PROTOCOLS AND LAYERS

NETWORK TOPOLOGIES



A topology is the layout of a network.
Bus: Slow network due to data collisions on the single backbone cable.
Star: If the central switch fails, the whole network fails. If one device fails, the network is fine.
Ring: Data moves in one direction which prevents collisions. Only one device can send data at once.
Mesh: Each device is connected to every other device so they can send data the fastest route. There is no single point where network can fail. Require lots of wire.

PROTOCOLS

Protocols are the rules for how devices communicate and transmit data across a network.
Every device has a **MAC address** so that it can be identified on a network. Eg: 98-1C-B3-09-85-15
IP addresses are used when sending data between networks. They can be static (permanent) or dynamic (different each time the device connects).
TCP/IP: Used to send data between networks in packets.
Transmission Control Protocol (TCP): Splits the data into packets and re-assembles. Checks data is sent correctly.
Internet Protocol (IP): does the packet switching
Hyper Text Transfer Protocol (HTTP): for accessing websites
HTTPS: The secure version of HTTP
File Transfer Protocol (FTP): Moves files between devices
Post Office Protocol (POP3): Retrieves emails from server. Once you download the email the server copy is deleted.
Internet Message Access Protocol (IMAP): Retrieves email from server. Email is kept on server, you see a copy.
Simple Mail Transfer Protocol (SMTP): sends emails.

LAYERS

Network protocols are divided into layers so that protocols with similar functions are grouped together.

Layer 4: Application	•Turn data into applications or websites •HTTP, FTP, SMTP
Layer 3: Transport	•Control the flow of data •TCP
Layer 2: Network	•Direct data packets between networks •IP
Layer 1: Data Link	•Sending data over a physical network •Ethernet

PACKET SWITCHING

- Data is split into packets and numbered in order.
- Each packet is send the fastest route across the internet by the routers. This means packets can take different routes and arrive out of order.
- The packet numbers are used to put them in order.
- If packets are missing a timeout message is sent
- Once all have arrived a receipt confirmation is sent to the device that sent them.

EXAM QUESTIONS

1. Explain why protocols are used
2. Describe how packet switching works
3. Evaluate the benefits and drawbacks of a mesh network.
4. Draw topologies for bus, ring and star networks.
5. Explain the difference between HTTP and HTTPS
6. Explain the difference between POP3 and IMAP

1.6 SYSTEM SECURITY

TYPES OF ATTACK

Attack	How it works	How to prevent it
Passive	Network traffic is monitored and then data is intercepted	Encryption so that intercepted data cannot be understood
Active	Someone deliberately attacks a network with malware (eg: a virus)	A firewall and antivirus software
Insider	Someone with network access abuses this to steal information	User access levels to control how much data people can access.
Brute Force	Trial an error until a password is attacked	Making passwords difficult to guess. Locking accounts after failed attempts.
Denial of Service	The network is flooded with useless data so it is too slow to use	This attack is hard to prevent but a firewall can help.
SQL Injection	SQL commands are typed into the input boxes on a website to access data or alter the database	Having strong validation on all input boxes so that only expected data can be entered
Phishing	Emails with links that trick people into entering their personal information	Looking for signs that an email is not from a real company.
Social Engineering	When a person manipulates someone else into handing over sensitive information	Policies and rules for staff about handing over data. Staff training.

NETWORK SECURITY KEY TERMS

Malware: malicious software intended to cause harm.
Penetration Testing: Organisations employ professionals to try and hack their network so that they can find areas of weakness.
User Access Levels: Different employees have different levels of access to programs, websites and data.
Encryption: data is scrambled so that it cannot be understood if intercepted. It can only be decrypted with a key.
Network Forensics: Data packets are captured as they enter the network and analysed to find out the cause of a network attack.

Types of Malware

Virus - attach themselves to files and copy themselves when the user copies or opens a file.

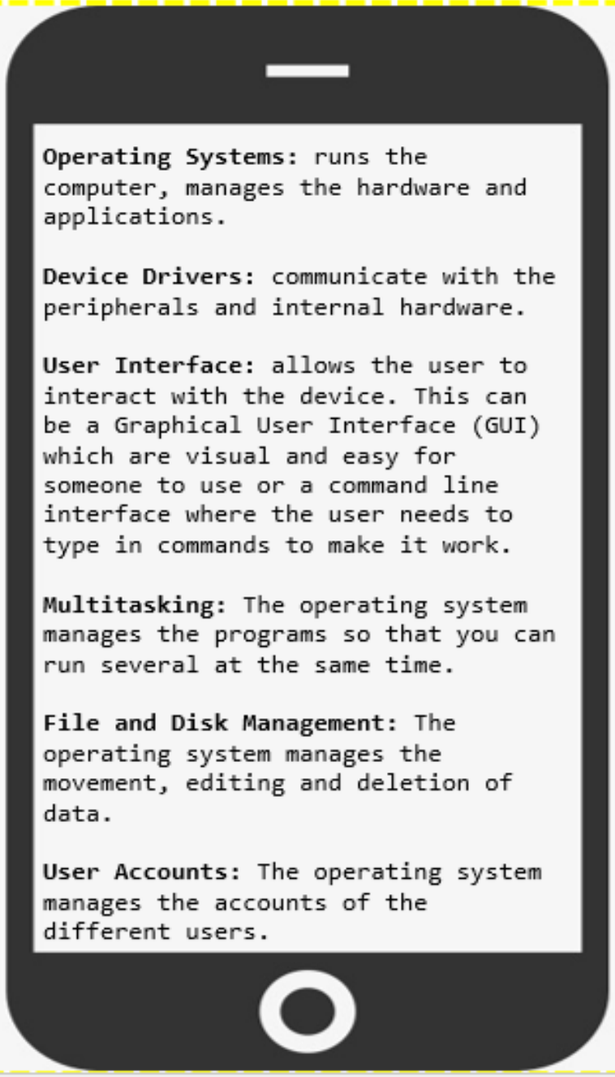
Worm - copy themselves without the user doing anything.

Trojan - malicious software pretending to be a legitimate program.

EXAM QUESTIONS

1. Describe what is meant by "Malware"
2. Describe how a brute force attack works and how to prevent it.
3. Explain how to keep a network secure.
4. Evaluate the benefits and drawbacks of a business using penetration testing

1.7 SYSTEMS SOFTWARE



Operating Systems: runs the computer, manages the hardware and applications.

Device Drivers: communicate with the peripherals and internal hardware.

User Interface: allows the user to interact with the device. This can be a Graphical User Interface (GUI) which are visual and easy for someone to use or a command line interface where the user needs to type in commands to make it work.

Multitasking: The operating system manages the programs so that you can run several at the same time.

File and Disk Management: The operating system manages the movement, editing and deletion of data.

User Accounts: The operating system manages the accounts of the different users.

Utility Software

Utilities are the programs that help maintain and configure a program. Most utility software is installed with the Operating system.

Defragmentation: Defragging a magnetic hard drive groups all of the files for each program together and all of the free space together. This makes it read and write quicker.

Back Up Utilities: Schedules and manages back ups. Full back ups = all data is backed up. Incremental = only files since the last back up are copied.

Compression: reduces the size of large files so that they take up less space. Files then need to be extracted before they are used.

Encryption: scrambles the data to protect it so that if someone else gets hold of it they cannot access it.

Open Source and Proprietary Software

Open Source	Proprietary
It's usually free and the source code is available so it can be adapted for individual needs	Usually has to be paid for
Others can improve the code	Only the compiled code is released so it cannot be edited
Strong online support communities	Good customer support
	May not fit the users exact

EXAM QUESTIONS

1. Evaluate the benefits and drawbacks of releasing a piece of software as open source rather than proprietary.
2. Explain three functions of the operating system in a computer
3. Evaluate the difference between doing an incremental back up and a full back up.

1.8 ETHICAL, LEGAL, CULTURAL & ENVIRONMENTAL CONCERNS

Ethical

- Ethics is about what is considered right and wrong by society.
- If a company does not behave in an ethical way it might make their customers lose trust in them.
- Issues such as cyberbullying, trolling and the use of social media can raise ethical issues.
- **Privacy:** Users trust companies to keep their data private so companies need to take care of it
- **Censorship:** is when a country or organisation controls what people can access on the internet.
- **Surveillance:** surveillance is when someone is monitored using technology.

Legal

- **Data Protection Act:** controls how personal data is used. Eg: it has to be accurate and up to date, kept secure, should not be kept longer than needed
- **Freedom of information Act:** gives the public the right to see information about public organisations
- **Computer Misuse Act:** makes it illegal to hack a network or create a virus.
- **Copyright, Designs & Patents Act:** protects things you have created from being used without permission
- **Creative Commons:** lets people release their work to be used and shared legally and sometimes modified.

Stakeholders:

The people or groups affected by a particular situation

Environmental

- Computing devices contain raw materials
- Devices use lots of energy when turned on
- Ewaste is when we throw away devices because they are broken or because we want to upgrade
- Ewaste can lead to pollution
- The **Waste Electric and Electronic Equipment (WEEE)** directive has rules for how devices should be disposed so that they're recycled/disposed of safely
- Devices can also have a positive impact on the environment – eg video calls rather than travelling a long distance causing pollution.

Cultural

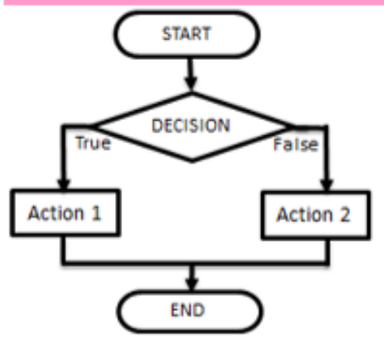
- One cultural issue in computing is the **Digital Divide.** Some people do have access to technology, others don't
- Not having access to technology can be a disadvantage as it limits access to information, online learning, online banking, communication etc.
- The digital divide can be due to people not having enough money to buy devices or due to living in places without internet access, or not having the skills to use the technologies available.
- Technology has also impacted how businesses run as many now use online shops and services

2.1 ALGORITHMS

COMPUTATIONAL THINKING

Abstraction	•Focussing on just the important details of a problem
Decomposition	•Breaking a problem down into smaller parts so that it is easier to solve
Algorithmic thinking	•creating a step by step solution to a problem

FLOWCHART



PSEUDOCODE

```
START
IF the Decision = TRUE
THEN:
      Perform Action 1
ELSE
      Perform Action 2
ENDIF
END
```

SEARCHING ALGORITHMS

To find an item in a list, computers need to use a searching algorithm. A linear search and binary search are both examples of sorting algorithms.

Linear Search: Checks each item in the list one by one until it finds what it is looking for
+ Simple, list doesn't need to be ordered
- Not efficient, takes time with lots of data

Binary Search: Finds the middle item in an ordered list by doing (n+1)/2. IF the middle item is what it is searching for it stops. If not, it compares the item you are searching for to the middle item so that it knows whether to look in the first half or second half of the list. Then it repeats these steps until the item is found
+ More efficient than a linear search
- Only works on an ordered list, complex to

SORTING ALGORITHMS

Sorting algorithms sort items into an ordered list.

Bubble Sort: Checks the first two items in a list, swaps them if they are in the wrong order and then moves onto the next two items and repeats the process. Once it has passed through the list once it goes through again until none of the items need swapping. + Simple. – Takes a long time

Merge Sort: Finds the middle item (n+1)/2 and splits the list in half. Repeats this step until the list is split into individual items (sub-lists). It them merges (joins) the sublists in pairs. Each time the sublists are paired they are sorted into the correct order. + Efficient – Slow

Insertion Sort: Looks at the second item in a list and compares it to the items that are in front of it, then inserts it into the right place. It then moves to the next item in the list and repeats these steps. + Quick for sorting small lists – slow with long lists

2.2 PROGRAMMING TECHNIQUES

DATA TYPES

Data Type	Definition
String	Text eg: "Hello"
Integer	Whole number eg: 32
Float/Real	Decimal number eg: 1.2
Boolean	Two values eg: true or false
Character	A single character eg: b

Casting is when you want to change between data types. Eg – if you want to use an integer in a sentence you would need to convert it to a string

VARIABLES AND CONSTANTS

Variable – A value which may change while the program is running. Variables can be local or global.

Local Variable – a variable which can only be used within the structure they are declared in.

Global Variable – a variable which can be used in any part of the code after they are declared

Constant – A value which cannot be altered as the program is running.

OPERATORS

Operator/Function	Definition
Exponentiation	Raises a number to a power eg: 2**3 OR 2 ^3 (=2^3)
Quotient/DIV	Gives the whole number after a division
Remainder/MOD	Gives the remainder part of a division
==	Is equal to
! or <>	Is not equal to
<	Is less than
>	Is more than
>=	Is more than or equal to
<=	Is less than or equal to

ARRAYS

One-Dimensional Arrays- this is like a list.
In this example an array has been created called students. The list can hold 3 items (as shown).

```
array students [3]
students [0] = "Bob"
students [1] = "Dave"
students [2] = "Bob"
```

This command would print the second item (1) From the array. It would print "Dave".

```
print(students[1])
```

Two-Dimensional Arrays – these are lists within lists (like a table)

```
Grades=[["Bob", "22%", "44%"], ["Dave", "85%", "100%"]]
```

The code above creates the 2D array. The code Below would output:
"Bob's first test score was 22%"

	0	1	2
0	Bob	22%	44%
1	Dave	85%	100%

```
print("Bob's first test score was " + Grades [0, 1]
```

2.2 PROGRAMMING TECHNIQUES CONTINUED

PROGRAMMING CONSTRUCTS

A Sequence is when there are programming steps that are carried out one after another.

Selection is where there are different paths in your code eg: IF, ELIF, ELSE

Iteration is when there is repetition (loops) in code. This could be a WHILE loop (do something WHILE a condition is met) or a FOR loop (do something for a set number of times)

This count-controlled loop would print "Hello World" 8 times.:

```
for i=0 to 7
      print ("Hello")
next i
```

These condition controlled loops would check if a password's correct:

```
while answer != "letmein123"
      answer=input("Enter password")
endwhile
```

```
do
      answer=input("Enter password")
until answer=="letmein123"
```

STRING MANIPULATION

0	1	2	3
W	o	r	d

The characters in a string are numbered starting with position 0.

Function	Purpose
x.length	Gives the length of the string
x.upper	Changes the characters in the string to upper case
x.lower	Changes the characters in the string to lower case
x[i]	Gives the character in position i. Eg: x[2] = "r"
x.substring(a,b)	Gives the characters from position a with length b. Eg: x.subString(1,2) = or
+	Joins (concatenates) two strings together

FILE HANDLING

Myfile=openRead("myfile.text")	Opens the file in read mode
Myfile=openWrite("myfile.text")	Opens the file in write mode
Myfile.writeLine ("Hello")	Writes a line to the file
Line1=myfile.readLine()	Reads one line of the file
Myfile.close()	Closes the file
endOfFile()	Used to determined the end of a file

IF/ELSE AND SWITCH/CASE FOR SELECTION

Selection can be shown using IF/ELSE or SWITCH/CASE

IF ELSE

```
If choice == "a" then
   print("You chose A")
elseif choice=="b" then
   print("You chose B")
else
   print("Unrecognised choice")
```

SWITCH/CASE

```
Switch entry:
   case "A":
      print("You chose A")
   case "B":
      print("You chose B")
   default:
      print("Unrecognised choice")
```

2.2 PROGRAMMING TECHNIQUES CONTINUED

SUB PROGRAMS

Procedures are a set of instructions stored under a name so that you can call the procedure to run the whole set of instructions.
A **function** is like a procedure but always returns a value.
Parameters are variables used to pass values into a function or procedure.

A procedure **with** parameters	A procedure **without** parameters

procedure intro (name)
  print("Hello " +name)
  print("Welcome to the game")
endprocedure
	procedure intro ()
	  print("Hello")
	  print("Welcome to the game")
	endprocedure

Functions must take at least one parameter and must return a value:

```
function double(number)
    print number*3
endfunction
```

SQL (Structured Query Language)

SQL is the language used to manage and search databases.

Commands	Example	What it does
SELECT FROM	SELECT name, age FROM students	Displays the name and age of everyone in the students table
WHERE	SELECT name FROM students WHERE gender=male	Displays the name of everyone in the students table who's gender is male
LIKE	SELECT name FROM students WHERE name LIKE "% Smith"	Displays the students names that end with Smith.
AND	SELECT name FROM students WHERE gender=male AND attendance > 90	Displays the students who are male and have an attendance of more than 90.
*	SELECT * from students	Selects all of the fields from the students table

RECORDS

Records are a data structure used to store a collection of data. They can store information of different data types.
Field = each item in a record is a field.
Each field has a name and data type.

A record can be created like this:

```
record students
    int student_number
    string student_name
    bool passed_test
endrecord
```

Data can be assigned using variables:

```
Student1=students(1,"Bob Jones", True)
Student2=students(2,"Steve Smith", False)
Student3=students(3,"Sally Roberts", True)
```

The whole record can be accessed using the variable name:

```
print(Student1)
```

(1, "Bob Jones", True)

or part of a record can be accessed:

```
print(Student3.student_name)
```

Sally Roberts

2.3 PRODUCING ROBUST PROGRAMS

DEFENSIVE DESIGN

Programmers try to protect their programs by testing them to reduce the number of errors, predicting how users might misuse their program and trying to prevent it and making sure their code is well maintained.

Input Sanitisation – removes any unwanted characters that have been entered into a program

Input Validation – Checks if the data meets certain criteria before passing it through the program. The following validation checks can be used:

Presence check	Checks that data has been entered
Length check	Checks the data is the correct length
Range check	Checks the data is within a set range
Format check	Checks it's in the correct format (Eg:dd/mm/yy)
Check digit	Checks numerical data is entered correctly
Look-up table	Checks against a table of accepted values

Authentication – Where a program confirms the identity of a user before giving them access to the full program. This could be done through usernames and passwords.

Maintainability – Code that has been well maintained is easy to edit without causing errors. A well maintained code will have **comments** to help other programmers understand the code, as well as **appropriate names for variables and sub programs**, and **indentation** so that it is easy for programmers to see the flow of the program. Global variables should only be used where

TESTING

A program should be tested to check for any errors.

Final Testing – The program goes is tested once at the end of development. Everything is tested in one go.

Iterative testing - a program is tested and then changes are made as it goes through the development cycle again. It may go through this process a few times to make sure it is exactly what the customer wants.

Test data can fit into 3 different categories:

Normal	Data which is likely to be entered into the program and should be accepted
Extreme/ boundary	Data on the limit of what should be accepted
Erroneous	Data that should not be accepted

TYPES OF ERROR

A program should be tested to check for any errors.

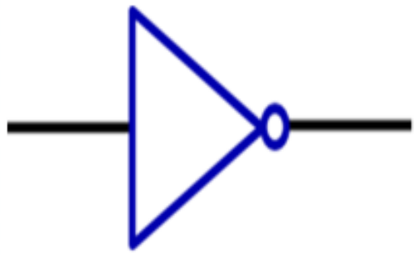
Syntax Error – something which doesn't fit the rules or grammar of the programming language.

Logic Error – the program runs but not as expected. Eg: < user instead of >.

2.4 COMPUTATIONAL LOGIC

NOT GATE

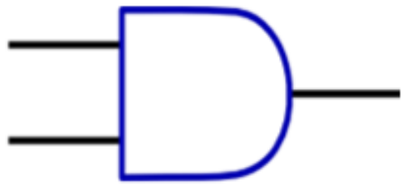
A NOT gate takes an input and outputs the opposite.



Input	Output
0	1
1	0

AND GATE

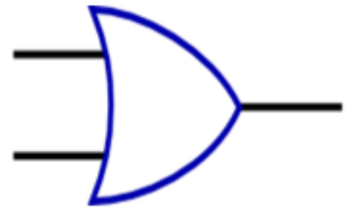
For an AND gate to give an output of 1, both inputs must be 1.



Input A	Input B	Output
0	0	0
1	0	0
0	1	0
1	1	1

OR GATE

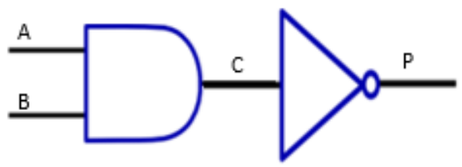
For an OR gate to give an output of 1, either inputs must be 1.



Input A	Input B	Output
0	0	0
1	0	1
0	1	1
1	1	1

COMBINED GATES

Logic gates can be combined:



A	B	C	P
0	1	0	1
1	0	0	1
1	1	1	0
0	0	0	1

LOGIC EXPRESSIONS

The table below shows the logic gate expressions and notations that you need to know:

Gate	Expression	Notation
NOT	NOT A	¬A
AND	A AND B	A ∧ B
OR	A OR B	A ∨ B

WHY COMPUTERS USE BINARY

Computers use 1s and 0s to represent the flow of electricity in their circuits.

0 = **off**
1 = **on**

Bit = a single bit (0 or 1)
Nibble = 4 bits
Byte = 8 bits
Kilobyte = 1000 bytes
Megabyte = 1000 kilobytes
Gigabyte = 1000 megabytes
Terabyte = 1000 gigabyte
Petabyte = 1000 terabytes

2.5 TRANSLATORS AND FACILITATORS OF LANGUAGE

HIGH LEVEL LANGUAGES

- Eg: Python, Java etc
- Each instruction in a high level code represents many machine code instructions.
- The code will work on many different computers and processors
- Data can be stored in different structures like lists and arrays
- The code is easy to read and understand
- The code has to be converted into machine code for the computer to understand it
- Programs will be less memory efficient as there is no control over what the CPU does

LOW LEVEL LANGUAGES

- Eg: Machine code (binary) and assembly language
- Each instruction only represents one instruction of machine code
- Low level languages are written for one particular machine or processor
- To store data the programmer needs to understand how the CPU manages memory
- Low level code is difficult to read and understand
- Machine code can be executed without translators
- Programs are more memory efficient as you control what the CPU does

TRANSLATORS

High level languages have to be translated to machine code for the computer to understand them.

Assemblers – turn assembly language into machine code

Compilers – Translate all of the code in on go to create an executable file. A compiler can take a long time but the final code runs quickly and gives a list of errors for the entire program.

Interpreters – Translates the code one instructions at a time. This means the program will run more slowly. No executable file is created so the code will need to be translated every time it runs. The interpreter will stop after each error which is helpful when debugging

IDE'S (INTEGRATED DESIGN ENVIRONMENTS)

IDE's help programmers develop their code. They have a range of features to do this:

Editors – the area which the code is written in. Includes line numbers and colour coding for different features of the code (variables, comments etc)

Run Time Environment – Lets the programmer run the code quickly to test it for errors

Error Diagnostics – includes diagnostic tools to help find and solve errors

A Translator – to translate the code into machine code

Breakpoints – Stop the program on certain lines so that information up to that point can be gathered.

2.6 DATA REPRESENTATION

DENARY

Denary is the decimal number system that we are used to. It uses the numbers 0-9 and the column headings go up in powers of 10.

100 (Hundreds)	10 (Tens)	1 (Units)
2	**3**	**8**
2 lots of 100	3 lots of 10	8 lots of 1

BINARY

Binary uses the numbers 0 and 2. The column headings go up in power of 2:

128	64	32	16	8	4	2	1
0	**1**	**0**	**0**	**0**	**1**	**1**	**1**

64 + 4 + 2 + 1 = 71

HEXADECIMAL

Hexadecimal uses 0- F (A=10, B=11, C=12, D=13, E=14, F=15). The headings go up in powers of 16.

16	1
3	**D**
3 lots of 16	D (13) lots of 1

To convert a binary number to Hexadecimal, split into 2:

128	64	32	16
1	**1**	**0**	**0**

8	4	2	1
1	**1**	**0**	**0**

= C

3* 16 = 48
D (13) * 1 = 13
48+13=61

= 7

BINARY ADDITION

```
  1 0 0 1 0 1 0 1
+ 1 1 0 1 1 0 1 1
1 1 1 1 1 0 0 0 0
1     1 1 1 1 1
```

This binary addition gives an overflow error as the total does not fit in 8 bits (a byte).

BINARY SHIFT

A binary shift to the left multiplies the number by 2. A binary shift to the right divides it by 2. Below is an 8 bit binary number which has been shifted 2 places to the right.

Original number	1	1	0	0	1	1	0	1
Shifted number	0	0	1	1	0	0	1	1

CHARACTERS

Character sets = the characters that are recognised or represented by a computer system

ASCII = Each character is represented by a 7 bit number with a 0 in front to make it up to a byte.

Extended ASCII = Each character is represented by an 8 bit binary number. This gives 256 different possibilities.

Unicode = Each letter is represented by a 16-bit or 32-bit binary number. This gives at least twice as many character options as ASCII and allows the character set to represent characters and symbols from all languages.

2.6 DATA REPRESENTATION CONTINUED

IMAGES

Images are made up of pixels
The colour of each pixel is represented by a binary number
If an image uses 1 bit to represent each colour then it will only have 2 colours:

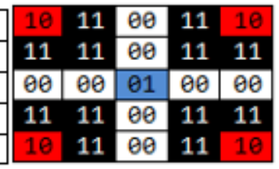
0	0	1	0	0
0	0	0	1	0
1	1	1	1	1
0	0	0	1	0
0	0	1	0	0

This is a 1-bit image so it uses 2 colours.

0=white and 1=black

Using more bits allows for more colour options:

10	11	00	11	10
11	11	00	11	11
00	00	01	00	00
11	11	00	11	11
10	11	00	11	10



This is a 2-bit images so it uses 4 colours.

00=white, 01=blue, 10=red, 11=black

Colour depth = the number of bits used for each pixel

Resolution = how many pixels are in a certain space – this is measured in "dots per inch". If there are more dots per inch then there are more pixels in the image so it will have a higher resolution and a better picture quality.

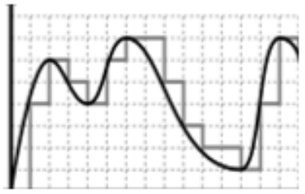
The higher the resolution or the colour depth, the more bits used, so the bigger the file size.

Metadata = the information about the image file that is stored within it. This makes sure the file is displayed correctly. It can include: the height, width, colour depth, resolution and file format as well as the time and date that the image was created.

SOUND

When sound is recorded it is an analogue signal (waves). It has to be converted to a digital signal so that it can be stored by a computer. This is done by sampling

Sampling: The amplitude of the wave is measured at regular intervals which creates a digital representation of the wave. If samples are taken more frequently then you will end up with a more accurate sound file but it will be a larger file size.



The analogue wave is smoother and shows continuous data. The digital sampling shows the amplitude of the wave at different points.

COMPRESSION

Compression is used to make file sizes smaller. Smaller file sizes means that data will be faster to send, quicker to download (so webpages will load faster) and it will take up less storage space.

Lossy Compression: permanently removes some of the data from a file to make the file size smaller. The file – eg: an image or sound track – will be a lower quality than the original.

Lossless Compression: data is temporarily removed from the file and then put back together when it is opened. This is good for program files or documents where you do not want to lose any content but the files can only be made a little bit smaller.

Design & Technology Department Schemes of Work
Knowledge Organiser:

Design Brief: A clock manufacturer would like you design and make your own version of a clock from sustainable materials you can obtain yourself. It is important that you make sure that the final design meets all the requirements that you identify for such a product. For instance, if you decide to designthe clock that is for a young child, it should meet all of the criteria for this type of user.

RETHINK	Do we make too many products? Design in a way that considers people and the environment
REUSE	Use a product to make something else with all or parts of it.
RECYCLE	Reprocess a material or product and make something else
REPAIR	When a product breaks down or doesn't work try to fix it
REDUCE	Cut down the amount of material and energy you use as much as you can
REFUSE	Don't use a material or buy a product if you don't need it or if it's bad for people or the environment

Key words- Environment, Sustainable, Mechanism, Moulding, Composites

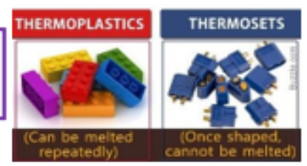
<u>P.P.E</u>
Personal Protective Equipment

<u>P.P.E for the workshop</u>
Gloves, Apron, Safety Goggles, Facemask,

<u>RESEARCH SECTION</u>
Examples include;
- Task Analysis
- Product Analysis
- Consumer Profile

<u>Manufactured Boards</u>
Strips or pieces of wood (chips/dust) glued and pressed with heat to form boards or sheets.

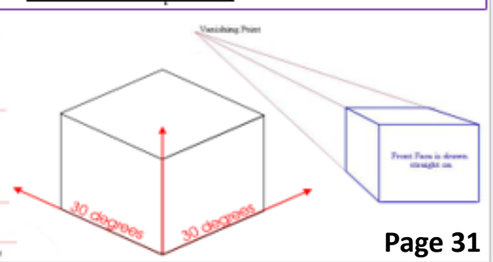
Materials



<u>Plastics:</u>
There are 2 types of plastic THERMOPLASTIC & THERMOSETTING.
Thermoplastics are polymers (chemical compound with molecules bonded together in long chains) that can be melted and formed many times. Examples include – HIPs, Acrylic Polypropylene and ABS (Acrylonitrile Butadiene Styrene)

<u>Clock Mechanism:</u>
POLYPROPYLENE CASE / RUBBER WASHER / BUILT-IN HANGER / CENTRE FIXIN6 NUT / SPINDLE.

<u>Sketching Techniques</u>
<u>Third angle Projection</u> <u>One Point Perspective</u>
<u>Isometric Projection</u>



Verb Endings

1. Find the infinitive
2. Remove AR/ ER / IR
3 Add endings to stem

I speak: hablar -> habl -> hablo

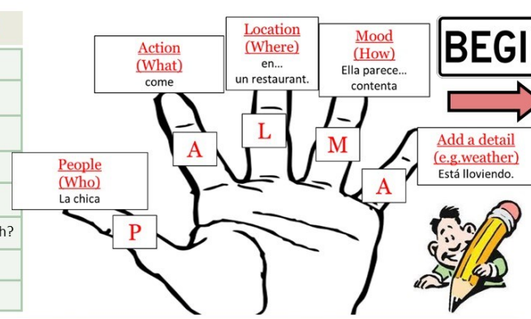
Presente		AR	ER	IR
yo	I	o	o	o
tú	you (s)	as	es	es
el/ella	he /she / it	a	e	e
nosotros	we	amos	emos	imos
vosotros	you (pl)	áis	éis	is
ellos / ellas	they	an	en	en

Pretérito		AR	ER / IR
yo	I	é	í
tú	you (s)	aste	iste
el/ella	he /she / it	ó	ió
nosotros	we	amos	imos
vosotros	you (pl)	asteis	isteis
ellos / ellas	they	aron	ieron

Imperfect		AR	ER / IR
yo	I	aba	ía
tú	you (s)	abas	ías
el/ella	he /she / it	aba	ía
nosotros	we	ábamos	íamos
vosotros	you (pl)	abais	íais
ellos / ellas	they	aban	ían

¿¿¿ PREGUNTAS ???

¿Qué?	What?
¿Cuándo?	When?
¿Cuál(es)?	Which?
¿Quién(es)?	Who?
¿Dónde?	Where?
¿Cuánto(s)?	How many / much?
¿Por qué?	Why?
¿Cómo?	How?



PRESENT		PAST		FUTURE	
normalmente	normally	ayer	yesterday	mañana	tomorrow
en general	in general	anteayer	the day before yesterday	en dos días	in 2 days
siempre	always	el lunes pasado	last Monday	el martes próximo	next Tuesday
todo el tiempo	all the time	el fin de semana pasada	last weekend	la semana que viene	next week
a menudo	often	el mes pasado	last month	el año que viene	next year
a veces	sometimes	el año pasado	last year	en el futuro	in the future
de vez en cuando	from time to time				
nunca	never				

a mi ver	In my opinion
desde mi punto de vista	From my point of view
diría que	I would say
creo que	I believe that
pienso que	I think that
para mí	For me
opino que	I think that

I like	I don't like
me encanta	odio
me gusta	no me gusta
me chifla	no aguanto
me flipa	detest

es / it is | era / it was | será / it will be

"because"

P	porque
P	puesto que
Y	ya que
D	dado que
C	como

Quantifiers

muy	very
bastante	quite
un poco	a bit
mucho	a lot
raramente	rarely
demasiado/a (s)	too much
casi	almost

SER

D escription
O ccupation
C haracteristics
T ime
O rigin
R elationship

yo	soy
tú	eres
el/ella	es
nosotros	somos
vosotros	sois
ellos/ellas	son

ESTAR

P osition
L ocation
A ction
C ondition
E motion

yo	estoy
tú	estás
el /ella	está
nosotros	estamos
vosotros	estáis
ellos/ellas	están

Imperfect Was-ing, were-ing and used to doing

Preterite Used for completed action, with a beginning and an end

Future

It hasn't happened yet...so keep the full infinitive - AR / ER / IR

yo	é
tú	ás
el /ella	á
nosotros	emos
vosotros	éis
ellos / ellas	án

Yes, you can!

¡Sí, se puede!

Connectives

y	and
pero	but
o	or
donde	where
también	also
por ejemplo	for example
(des) afortunadamente	(un) fortunately
por otro lado	on the other hand
especialmente	especially
sin embargo / no obstante	however
al principio / primeramente/ primero	firstly
entonces	then
después	after
finalmente	finally
mientras	while

Positivo

- bondadoso/a • caring
- educado/a • polite
- gracioso/a • funny
- listo/a • clever
- extrovertido/a • outgoing

Negativo

- aburrido/a • boring
- vago/a • lazy
- travieso/a • mischievous
- quisquilloso/a • fussy
- egoísta • selfish

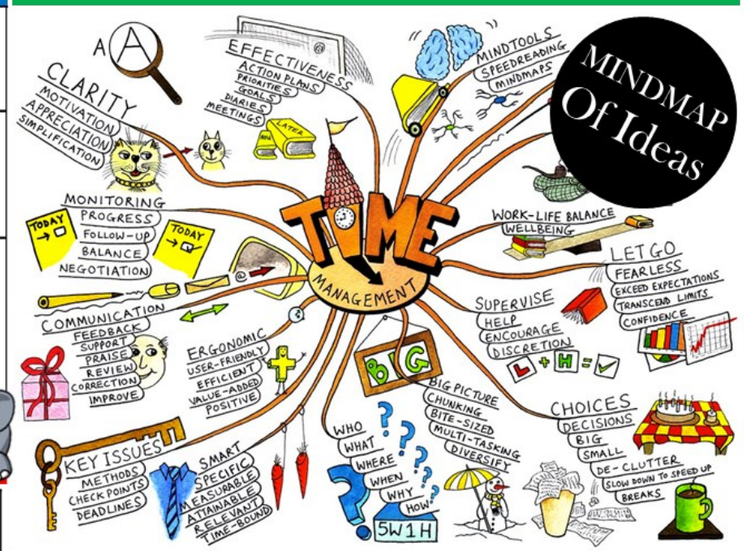
Key Vocabulary…

MIND MAPPING	A graphical way to represent ideas around your theme. Use of keywords and branches to show breadth of initial ideas.
VISUAL MOODBOARD	A collection of imagery and collaged ideas to present a visual understanding of your theme. Keep to a style of scheme of colour.
ARTIST RESEARCH	Show your understanding of contemporary and historical artists and artistic movements by analysing their work. To draw in their style and discuss your intention.

Always remember…

DON'T LIMIT YOURSELF	Even if it doesn't link to your starting point, it may relate to your theme. Add annotations and sketches to show/explain your thought process.
PRIMARY SOURCES	When researching a theme, collect images, photos, samples, magazine cuttings etc. Make sure all images are relevant.
PRESENTATION	Pull your boards together by being consistent. Stick to a particular style and/or colour scheme. Use DAFONT for titles if unsure.

Picture This…



Deeper Learning…

ANALYSING ARTWORK: -

CONTENT:

- What is the work about?
- Is the work realistic/abstract?
- Has it been exaggerated?
- Are there recurring features?
- What is the theme of the work?
- What message is communicated?

FORM:

- What colour does the artist use?
- What shapes does the artist use?
- What mark-making techniques?
- How big is the work – why?
- Does the artist have a style?

PROCESS:

- How has the work been made?
- What media/material has the artist used?

MOOD:

- How does the work make you feel?
- Does the colour, texture, form or composition effect your mood?
- Does the work reminisce about a dream in any way?

The Big Question…

NEXT STEPS:

- What is your intention?
- How will you use this style?
- What features will you try to replicate?
- How are you going to use this knowledge to further develop your work?
- How are you going to develop your own
- imagery in response to the artist and/or movement?

Activity: Take (10-15) of your own images linked to your theme (primary research) from observation. You will then draw from these images and develop further by exploring different media in the style of your chosen artist and/or movement.

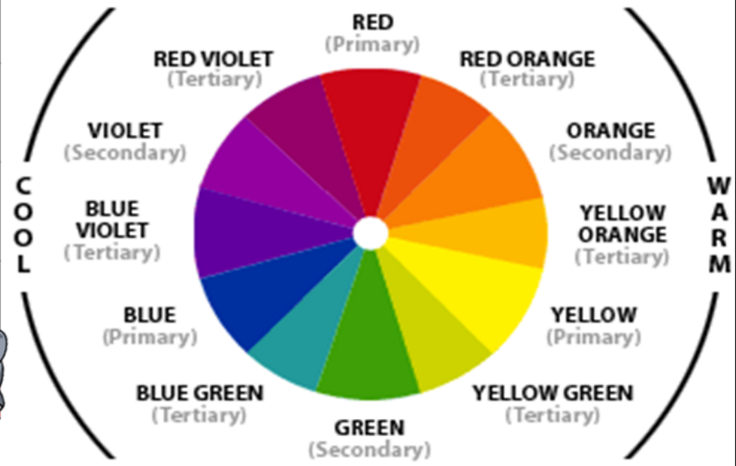
Key Vocabulary…

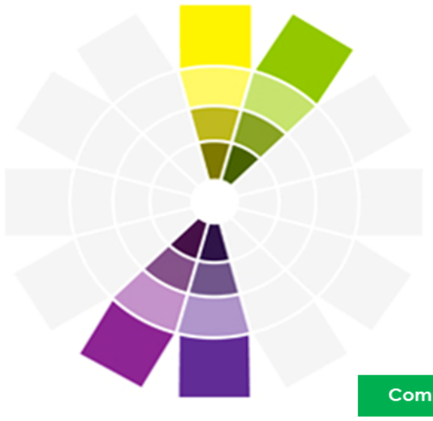
MEDIA	The substance an artist uses to create art e.g. collage, coloured pencils, paint etc.
MATERIALS	The same idea as media but can also refer to what the work is created on e.g. canvas, paper or clay.
TECHNQUES	The method used to complete the artwork, can be generic such as painting or more focussed such as blending.
PROCESSES	The method used to create artwork that usually follows a range of steps rather than just one skill.

Always remember…

COLOURED PENCILS	• Apply using a soft circular motion • Start with the lightest colours and build up • Avoid applying a thick line of tone
WATERCOLOUR	• Mix your own variations of paint instead of straight from palette • Avoid too much water as paper will bobble
ACRYLIC PAINT	• Mix your own paint instead of out of tub • Add colour to white to lighten rather than white to colour.
COLLAGE	• Rip or cut (not both) • Overlap to avoid gaps • Use a variety of tones
OIL PASTELS	• Start with lightest first • Press on heavy for strong coverage • Blend by overlapping

Picture This…





Complementary

Deeper Learning…

COLOUR THEORY

PRIMARY = RED, YELLOW, BLUE

SECONDARY = ORANGE, GREEN, PURPLE

TERIARY = SECONDARY + PRIMARY
SHADE = ADD BLACK

TINT = ADD WHITE

HARMONIOUS = COLOURS NEXT TO EACH OTHER ON COLOUR WHEEL

COMPLEMENTARY = OPPOSITE ON COLOUR WHEEL

MONOCHROMATIC = ONE COLOUR AND VALUES (LIGHT TO DARK)

HUE = PIGMENT OF ONE COLOUR

WARM = RED, ORNAGE, YELLOW

COOL = BLUE GREEN, PURPLE

The Big Question…

NEXT STEPS:

Have you chosen an image by refining and selecting through your images/drawings?

Have you developed this image further by using a variety of media, materials, techniques and processes?

Have you pushed this further by applying another method?

Activity: Take your favourite drawings and photocopy original before altering. Link to artist style and use a variety of techniques and processes to push further. Change scale and material to add depth to your artwork.

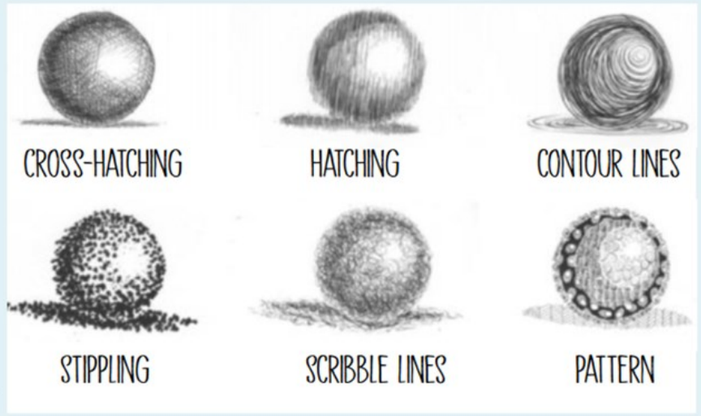
Key Vocabulary…

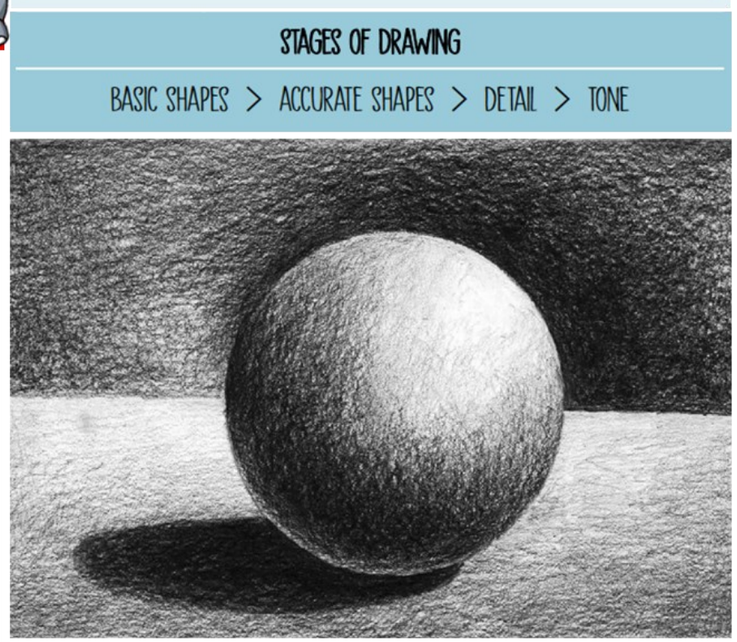
OBSERVATIONAL DRAWING	Drawing from looking at an image or object.
PRIMARY OBSERVATION	Drawing from an object that is directly in front of you.
SECONDARY OBSERVATION	Drawing from an image.
PHOTOGRAPHS	Using a camera to record images – this is classed as primary observation.
SKETCHES	Basic sketches and doodles can act as a starting point to aid in developing an idea.

Always remember…

CROSS-HATCHING	Cross-hatching uses fine parallel lines drawn closely together to create the illusion of shade or texture in a drawing. It is the drawing of two layers of hatching at right-angles to create a mesh-like pattern.
HATCHING	For pencil or pen-and-ink drawing. Hatching is one of the quickest ways to fill in the dark areas. By drawing a lot of fine lines that are parallel, the area as a whole is perceived as being darker.
STIPPLING	The art or process of drawing, painting, or engraving using numerous small dots or specks.

Picture This…





Deeper Learning…

ANNOTATION: -

STEP 1: DESCRIBE

- What is this an image of?
- What have you done?
- What was the purpose of the piece?

STEP 2: EXPLAIN

- How was the work made?
- How did you produce the effect?
- How did you decide on composition?

STEP 3: REFLECT

- Why did you use this specific method?
- Why are some areas better than others?
- What might you do differently next time?
- Why might you do it differently?
- How will your develop in response?

The Big Question…

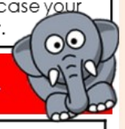
NEXT STEPS: -

- **Produce a range of tones by varying the pressure and layering**
- **Consider using softer pencils for darker shades**
- **Apply tone using a soft circular motion to create a smooth coverage. Filling all the white gaps and avoid shading in different directions**
- **Add detail/interest by applying tone using mark-making techniques**
- **Mark-making can be produced by making your own tools/paintbrushes**

Activity: Try to annotate or evaluate whenever you have an idea or a change in direction. Write about a technique that was successful or if something didn't go as planned.

Key Vocabulary…

ROUGH IDEA	Basic sketches of a final idea. Label to ensure clarity.
VISUAL OR MAQUETTE	An image or model created from selected materials (usually smaller in scale than intended.
FINAL PIECE	An image or sculpture that is the end product of your project/journey. Visual representation of pulling all prep work together to showcase your ideas and journey.



Always remember…

RULE OF THIRDS	The rule of thirds is a guideline which applies to the process of composing visual images. The horizon sits at the horizontal line dividing the lower third of the photo from the upper two-thirds.
LEADING LINES	Leading lines refers to a composition technique whereby the viewer's eye is attracted to lines that lead directly to the principle subject in the image.
BALANCED ELEMENTS	When different parts of a photo command your attention equally, perfect balance is achieved.
CROP	Cropping is the removal of unwanted outer areas from a photograph or illustrated image.

Picture This…

Deeper Learning…

FORMAL ELEMENTS OF ART: -

COLOUR: Primary colours cannot be mixed by using any other colours but in theory, all other colours are made from them.

Red + Yellow = Orange
Blue + Yellow = Green
Red + Blue = Purple

Orange, Green and Purple are secondary colours. All other colours (primary + secondary = tertiary).

Colour schemes could be adhered to fit with theme.

SHAPE: An area closed by line. Geometric or basic.

FORM: Form is a 3D shape which can be sculpted using clay, wire or Modroc.

In 2D art, tone and perspective can be used to create an illusion of 3-dimensions using light and dark to create shadows.

TEXTURE: Surface quality. The way it feels physically or the way it is made to feel.

TONE: Light to dark to create depth. This could be a shade or how dark or light a colour appears. Tones are created by the way the light falls onto a 3D object.

PATTERN: Created by repeating lines, shapes, tones or colour. The design used to create a pattern is often referred to as a motif. Motifs can be simple shapes or complex arrangements.

Patterns can be man-made, like a fabric or wallpaper design, or natural, such as the markings on animal fur.

LINE: Line can be used to portray different qualities such as: contours, feelings or expressions and movements.

Activity: Create a draft copy of your final design ideas. Make sure to label and photocopy sections if using a combination of a number of pieces.

FOOD SPOILAGE & FOOD SAFETY

WHAT CAUSES FOOD SPOILAGE?

- Bacteria, mould, fungi, yeast
- Insects, rodents, pests
- Chemical reactions
- Moisture, warmth, oxygen
- Time

SIGNS OF FOOD SPOILAGE

- Discolouration
- Change in texture (soft, slimy)
- Mould
- Unpleasant smell
- Off tasting

STORAGE OF FOODS

- Ambient foods—stored in a cool dry place at room temperature
- Frozen foods—stored in a freezer at –18°c
- Refrigerated foods stored in a fridge at 5°c

TYPES OF CONTAMINATION

- **PHYSICAL:** Hair, jewellery, plasters, glass, plastic
- **CHEMICAL:** cleaning products, pesticides
- **BIOLOGICAL:** bacteria, fungi, mould

Food Poisoning	Found in
Campylobacter	Raw chicken, meat, milk
Salmonella	Humans and animals. Raw chicken, eggs
Staph A	Humans—nose, eyes, hair
E.Coli 0157	Raw meat, vegetables from the ground (carrots)
Bacillus cereus	Cooked rice and pasta

SYMPTOMS OF FOOD POISONING

- Sickness
- Diarrhoea
- Nausea
- Fever
- Abdominal pain

HIGH RISK FOODS

- High in protein and moisture
- Raw meat, eggs, cheese, milk, fish

PREVENTING CROSS CONTAMINATION

- Washing hands before and during food prep
- Washing hands after handling raw foods
- Using colour coded chopping board
- Wearing correct clothing (apron, hat)
- Keeping raw foods separate from cooked foods
- Cleaning equipment thoroughly
- Keeping food stored at the correct temperature

Use-by-date/Best Before Date

- Use by date—food will be unsafe to consume after this date
- Best before date—food will be safe to consume but the

- **Key temperatures**
- Freezer = -18°c
- Fridge = 5°c
- Cooked food = 75°c
- Hot Held Food = 63°c
- Danger zone = 5°c to 63°c

FOOD PRESERVATION

- **Heat**—kills most microorganisms
- **Freezing/refrigerating**— microorganisms become less active and reproduction slows down
- **Drying**—removes moisture stopping microorganisms from reproducing

HACCP

Hazard Analysis Critical Control Point—a process where food businesses highlight potential hazards and put measures in place to reduce the risk

PREVENTING FOOD POISONING

- Cook food thoroughly and to correct temperature
- Store food correctly
- Wash hands regularly
- Check the dates of food
- Wash surfaces and equipment thoroughly
- Use correct equipment such as colour coded chopping boards

Changing UK Economy

Key words

De-industrialisation is the decline traditional industries, such as manufacturing.

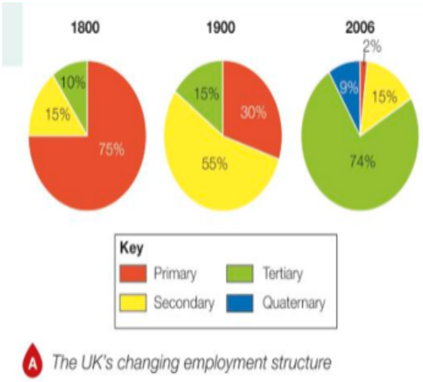
Globalisation is the growth and spread of ideas around the world

Post-industrial economy is where manufacturing industry declines and is replaced by growth in the service and quaternary sectors. This happened in the UK from the 1970s.

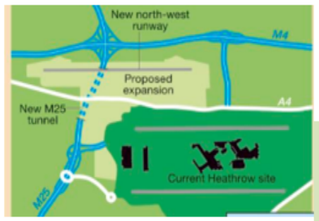
A **science park** is a group of scientific and technical knowledge-based businesses located on a single site.

A **business park** is an area of land occupied by a cluster of businesses.

Business Parks are purpose-built areas of offices and warehouses, often at the edge of a city and on a main road. Science parks are often located near university sites, and high-tech industries are established. Scientific research and commercial development may be carried out in co-operation with the university.

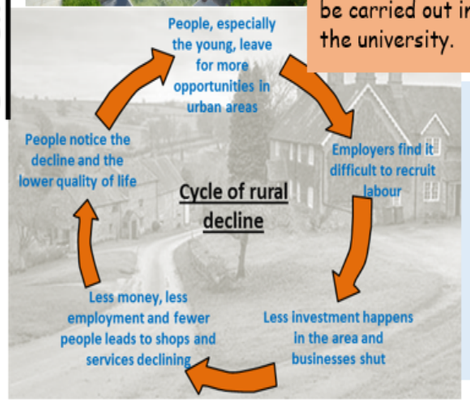


A The UK's changing employment structure



- Improvements include building new rail lines and roads and adding lanes to motorways e.g. London's Crossrail
- These schemes can create jobs, reduce journey times and ease congestion
- Examples of improvements and new developments are Liverpool2 (a port) and a new runway at Heathrow (an airport)
- They are intended to create new jobs and boost the economy

- The UK is connected to the wider world via trade, culture, transport and electronic communication
- These links often generate more money for the UK
- The UK has both political and economic links with the EU and the Commonwealth
- Economic links include trading links
- Political links include laws or advice and support



Industrial revolution

During the industrial revolution, more people were needed to build ships, work in steel making and with textiles. All these jobs are found in the secondary sector.
By 1900 over half of the workers in the UK were employed by secondary industries

Connection: The change in the UK's economy links to the case study of the growth, decline and regeneration of Manchester.

1900s

Since 1900 mechanisation and automation meant fewer people were required to work on the land and in industry

This lead to decline

Foreign industries become more competitive
Imports such as cola become cheaper than mining our own
Availability of coal in the UK declined

2000s

Demand for work increased in schools, hospitals and retail industries
Rural to urban migration
By 2000 over half the UK workforce was employed in tertiary industries

New quaternary industries are a massive and growing sector in the UK. - research and development.

Environmental Impacts of Industry in the UK

Hanson Cement – Ketton.
It has been operational since 1923 (93 years)

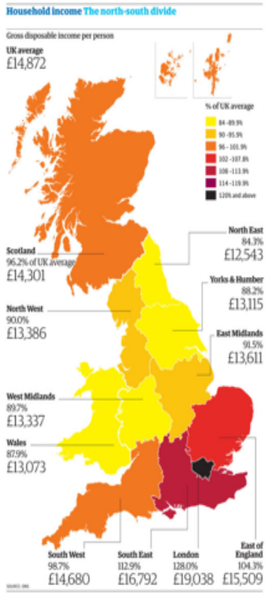
Environmental Issues
- Noise pollution
- Visual Pollution
- Dust from blasting
- Water/ soil contamination
- Destruction of habitats

Sustainable Development at Hanson Cement

1. Blasting is now only allowed to take place between 11am and 2pm and not on weekends.
2. Replanting trees on the disused quarry
3. Hanson cement burns recycled waste and uses solar panels so coal isn't used to power the plant.
4. Hanson Cement has funded road safety signs in the local village of Tinwell
5. One of the largest solar panel farms in the UK has been built at Hanson
6. Bat caves and badger dens have been built to reintroduce animals to the area

Activities

1. Describe the cycle of decline.
2. Describe the industrial change in the UK.
3. Describe the aims of a science and business park.
4. Evaluate the strategies for sustainable development at Hansen Cement.
5. Explain why there is counter urbanisation in some places in the UK.
6. Explain why there is a North South divide.
7. Evaluate the success or likely success of **one or more** strategies to resolve regional differences in the UK.
8. Social and economic changes in the UK rural landscape are: 1) positive in an area of population growth 2) negative in an area of population decline. Do you agree?



North-South Divide:

The cultural and economic differences between the north and south of the UK.

It implies one area being 'better off' in a range of factors

Combatting the North South Divide
- The launch of the Northern Powerhouse concept to encourage industrial development in northern cities such as Manchester, Leeds and Sheffield.
- Enterprise Zones
- Local Enterprise Partnerships (LEPs)
- Planned transport improvements e.g. HS2
- Government incentive packages to attract TNCs

Prepare for your extended writes:
Questions:

Contrast the economic challenges associated with population growth and decline in rural areas.

Suggest how the UK benefits from its membership in the Commonwealth.

1.BUG the question by boxing the command word and underlining the content you need to write about.
2.List the key vocabulary you will use.
3.Create a plan of what you would write in each paragraph.
4.Practice writing your answer from memory

Resource Challenges

Resources are things that humans require for life or to make our lives easier. Humans are becoming increasingly dependent on exploiting these resources, and as a result they are in high demand.

Significance of Water

Resources such as food, energy and water are what is needed for basic human development.

FOOD	WATER	ENERGY
Without enough nutritious food, people can become **malnourished**. This can make them ill . This can prevent people working or receiving education.	People need a supply of **clean and safe water** for drinking, cooking and washing. Water is also needed for food, clothes and other products.	A good supply of energy is needed for a basic standard of living. People need **light and heat** for cooking or to stay warm. It is also needed for industry.

Demand outstripping supply

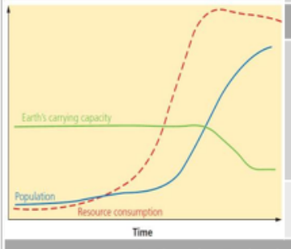
The demand for resources like food, water and energy is rising so quickly that supply cannot always keep up. Importantly, access to these resources vary dramatically in different locations

1. Population Growth

- Currently the global population **is 7.3 billion**.
- Global population has risen **exponentially** this century.
- Global population is expected to reach **9 billion by 2050**.
- With more people, the **demand** for food, water, energy, jobs and space **will increase**.

2. Economic Development

- As **LICs** and **NEEs** develop further, they require **more energy** for industry.
- **LICs** and **NEEs** want similar lifestyles to **HICs**, therefore they will need to **consume more resources**.
- Development means **more water is required** for food production as diets improve.



Resource Reliance Graph

Consumption – The act of using up resources or purchasing goods and produce.
Carry Capacity – A maximum number of species that can be supported.

Resource consumption exceeds Earth's ability to provide!

3. Changing Technology and Employment

- The demand for resources has driven **the need for new technology** to reach or gain more resources.
- More people in the **secondary and tertiary industry** has increased the **demand for resources** required for electronics and robotics.

Unit 2c — The Challenge of Resource Management

AQA

Food in the UK

Growing Demand

- The UK imports about 40% of its food. This increases people's **carbon footprint**.
- There is growing demand for greater choice of **exotic foods** needed all year round.
- Foods from abroad are more affordable.
- Many food types are unsuitable to be grown in the UK.

Impact of Demand

Foods can travel long distances (food miles). Importing food adds to our carbon footprint.
+ Supports workers with an income
+ Supports families in LICs.
+ Taxes from farmers' incomes contribute to local services.
- Less land for locals to grow their own food.
- Farmers exposed to chemicals.

Agribusiness

Farming is being treated like a large industrial business. This is increasing food production.
+ Intensive faming maximises the amount of food produced.
+ Using machinery which increases the farms efficiency.
- Only employs a small number of workers.
- Chemicals used on farms damages the habitats and wildlife.

Sustainable Foods

Organic foods that have little impact on the environment and are healthier have been rising.
Local food sourcing is also rising in popularity.

- **Reduces emissions** by only eating food from the UK.
- **Buying locally sourced** food supports local shops and farms.
- A third of people **grow their own food**.

Water in the UK

Growing Demand

The average water used per household has risen by 70%. This growing demand is predicted to increase by 5% by 2020.
This is due to:

- A growing UK population.
- Water-intensive appliances.
- Showers and baths taken.
- Industrial and leisure use.
- Watering greenhouses.

Deficit and Surplus

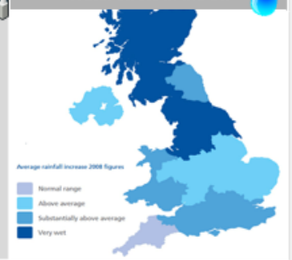
The north and west have a **water surplus** (more water than is required).
The south and east have a **water deficit** (more water needed than is actually available).
More than half of England is experiencing **water stress** (where demand exceeds supply).

Pollution and Quality

Cause and effects include:

- Chemical run-off from farmland can destroy habitats and kills animals.
- Oil from boats and ships poisons wildlife.
- Untreated waste from industries creates unsafe drinking water.
- Sewage containing bacteria spreads infectious diseases.

Water stress in the UK



Management

UK has **strict laws** that limits the amount of discharge from factories and farms.
Education campaigns to inform what can be disposed of safety.
Waste water treatment plants remove dangerous elements to then be used for safe drinking. Pollution traps catch and filter pollutants.

Water Transfer

Water transfer involves moving water through pipes from areas of surplus (Wales) to areas of deficit (London).
Opposition includes:

- Effects on **land and wildlife**.
- High maintenance **costs**.
- The **amount of energy** required to move water over long distances.

Energy in the UK

Growing Demand

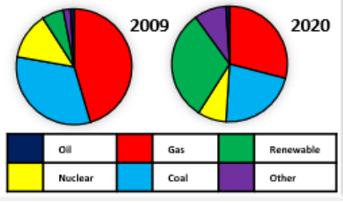
The UK **consumes less energy** than compared to the 1970s despite a smaller population. This is due to the **decline of industry**.

Energy Mix

The majority of UK's energy mix comes from **fossil fuels**. By 2020, the UK aims for 15% of its energy to come from **renewable sources**. These renewable sources do not contribute to **climate change**.

Changes in Energy Mix

- 75% of the UK's oil and gas has been used up.
- Coal consumption has declined.
- UK has become too dependent on imported energy.



Energy in the UK (continued)

Significance of Renewables

+ The UK government is investing more into low carbon alternatives.
+ UK government aims to meet targets for reducing emissions.
+ Renewable sources include wind, solar and tidal energy.
- Although infinite, renewables are still expensive to install.
- Shale gas deposits may be exploited in the near future

Exploitation

Nuclear	New plants provide job opportunities. Problems with safety and possible harm to wildlife. Nuclear plants are expensive.
Wind Farm	Locals have low energy bills. Reduces carbon footprint. Construction cost is high. Visual impacts on landscape. Noise from wind turbines.

Option 1: FOOD

Food Security is when people at all times need to have physical & economic access to food to meet their dietary needs for an active & healthy life. This is the opposite to Food Insecurity which is when someone is unsure when they might next eat.

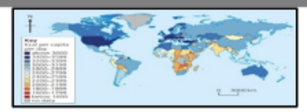
Human

- **Poverty** prevents people affording food and buying equipment.
- **Conflict** disrupts farming and prevents supplies.
- **Food waste** due to poor transport and storage.
- **Climate Change** is affecting rainfall patterns making food production difficult.

Physical

- The **quality of soil** is important to ensure crops have key nutrients.
- **Water supply** needs to be reliable to allow food to grow.
- **Pest, diseases and parasites** can destroy vast amounts of crops that are necessary to populations.
- **Extreme weather** events can damage crops (i.e. floods).

Daily Calorie Intake



This map shows how many **calories per person** that are consumed on average for each country.

This can indicate the global distribution of **available food** and **food inequality.**

Food Supply

This map shows the amount of **food produced** in different countries. Whilst Asia and **North America** have **high** production outputs, **Africa** and **Central America** have **low** production outputs.

Increasing Food Supply

Hydroponics - A method of growing plants without soil. Instead they use nutrient solution.

New Green Revolution - Aims to improve yields in a more sustainable way. Involves using both GM varieties and traditional and organic farming.

Biotechnology - Genetically modified (GM) crops changes the DNA of foods to enhance productivity and properties.

Irrigation - Artificially watering the land so crops can grow. Useful in dry areas to make crops more productive.

Sustainable Food Supply

This ensures that fertile soil, water and environmental resources are available for future generations.

Organic Farming - The banned use of chemicals and ensuring animals are raised naturally.

Permaculture - People growing their own food and changing eating habits. Fewer resources are required.

Urban Farming - Planting crops in urban areas. i.e. roundabouts.

Managed Fishing – Includes setting catch limits, banning trawling and promoting pole and line methods.

C.S. NEE- Indus Basin Irrigation System

Largest irrigation scheme in the world. Involves large and small dams. Thousands of channels provides water to supports Pakistan's rich farmlands.

Advantages

- **Improves food security by adding 40% more land for farming.**
- **Increased yield & range of foods.**

Disadvantages

- **Few take an unfair share of water**
- **Water is wasted and demand is rising due to population growth.**
- **High cost to maintain reservoirs.**

C.S. Almeria, Spain

Large scale agricultural development. Arid region of Spain used to grow crops in greenhouses.

Advantages

Less water is extracted from an already fragile environment.
Reduction in energy costs and greenhouse gases that cause climate change.
Workers pay taxes- contributes to 5% of Spain GDP.

Disadvantages

Plastic affects the natural ecosystems and habitats of the desert.
Plastic waste impacts the aquatic ecosystem.
Impact on their standard of living and quality of life, use of pesticides also impacts their health.

Subject: History Year 11 Topic: Power and the People 3

Key Vocabulary…

Industrial Revolution	A period of change brought about by new technologies allowing factories to mass-produce.
Suffrage	The right to vote.
Economics	The study of the production of wealth and the exchange of goods of services.
Protest	To gather together to publicly demonstrate disagreement with the rules.
Parliament	A group of people who represent the people of a nation in making decisions on how to run the country.
Abolitionism	The campaign against slavery in the British Empire.
Trade Union	A group of worker who gather together to negotiate for better pay and working conditions.
Chartists	A protest group who wanted to change the rules on who could vote and how elections were run.

Timeline

Abolition of Slavery in Britain	1807	Slavery was made illegal in the British Isles.
End of the Napoleonic Wars	1815	A huge series of wars against France.
The First Great Reform Act	1832	Middle-class wealthy people were given the right to vote.
Formation of the Chartist Movement.	1833	A loose organisation of campaign groups wanting voting reform.
Factory Act	1833	A law restricting working hours and conditions in factories.
Poor Law Amendment Act	1834	A law which meant that unemployed people were put into workhouses.
The Tolpuddle Martyrs	1834	A group of men were sentenced to transportation for trying to start a trade union.
Repeal of the Corn Law	1846	Removal of a law which taxed food imported from abroad.
Third Chartist Petition	1848	A large petition of signatures given to parliament by Chartists.

Important People

Henry Hunt	A radical orator who spoke about reforming the voting system at Peterloo.
Robert Peel	Prime Minister of the United Kingdom who repealed the Corn Law and invented the police force.
William Wilberforce	A prominent abolitionist campaigner against slavery.
Lord Shaftesbury	A reformer responsible for great changes in working conditions in the 19th century.

What changed over the period?

At the beginning of the 19th century slavery was legal throughout the British Empire and the Industrial Revolution was really just getting going; most people still lived in the countryside and farmed the land.
By 1900, slavery was illegal, most men in Britain could vote (but not women) and there were many laws protecting the rights of workers. Most people now lived in huge cities and worked in factories powered by electricity.

Always Remember…

The 8 Key Factors in Power and the People:

- War
- Religion
- Chance
- Government
- Communication
- The Economy
- Ideas like democracy, equality and representation
- The role of the individual

Exam Questions

Explain the significance of the Great Reform Act. (8)

In what ways were the Abolitionists and the Anti-Corn Law League similar? (8)

Remember there is one source question and a factors question on the Power and the People exam paper – Find examples at AQA | Subjects | History

Subject: History Year 11 Topic: Power and the People 4

Key Vocabulary…

Industrial Revolution	A period of change brought about by new technologies allowing factories to mass-produce.
Suffrage	The right to vote.
Economics	The study of the production of wealth and the exchange of goods of services.
Protest	To gather together to publicly demonstrate disagreement with the rules.
Parliament	A group of people who represent the people of a nation in making decisions on how to run the country.
Strike	Workers refuse to work in order to put pressure on business owners and the government.
Trade Union	A group of worker who gather together to negotiate for better pay and working conditions.
Immigrants	People who move into the country from another, many immigrants came from the British Empire.

Timeline

Formation of the NUWSS	1897	The main women's suffrage groups gathered into one.
Formation of the WSPU	1903	The Suffragette group was set up to take aggressive protest action.
The end of WWI	1918	Millions returned home and the demand for many resources fell.
Women gain the right to vote	1918	Some women over 30 gained the right to vote.
The General Strike	1926	The miners, dockers and railway workers went on strike.
Women gain voting equality with men	1928	Women gained the same right to vote as men for the first time.
The 'Windrush' begins	1948	Lots of working-age people began to move to Britain from the rest of the Empire.
Rivers of Blood Speech	1968	Enoch Powell MP makes a famous speech condemning immigration.
The Miners' Strike	1984	Coal-miners across the country go on strike against mines closures.

Important People

Millicent Fawcett	A campaigner for women's suffrage who formed the Suffragist movement in 1897. (NUWSS)
Emmeline Pankhurst	A campaigner for women's suffrage who formed the Suffragette movement in 1903. (WSPU)
Stanley Baldwin	Conservative Prime Minister during the General Strike in 1926.
Enoch Powell	A Conservative MP who spoke out against the immigration of more non-white people to the UK.

What changed over the period?

By the beginning of the 20th century, Britain was an advanced industrial nation and social changes such as women's suffrage were dividing society. The trade unions were at the height of their power as workers campaigned for better pay and conditions. During the 20th century the power of the trade unions would diminish drastically and Britain would be divided further when the government invited lots of people from the Empire to immigrate here in the mid-part of the century.

Always Remember…

The 8 Key Factors in Power and the People:

- War
- Religion
- Chance
- Government
- Communication
- The Economy
- Ideas like democracy, equality and representation
- The role of the individual

Exam Questions

Explain the significance of the Representation of the People Act. (8)

In what ways were the General Strike and the Miners' Strike similar? (8)

Remember there is one source question and a factors question on the Power and the People exam paper – Find examples at AQA | Subjects | History
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Subject: History Year 11 Topic: Elizabethan Politics

Key Vocabulary…

Monarch	The reigning king or queen of a nation.
Catholic	A Christian who follows the teachings of the Pope as leader of the Church.
Protestant	A Christian who does not follow the teachings of the Pope as leader of the Church.
Succession	.The passing of titles (especially the crown) to the next generation of a family.
Royal Court	The leading noblemen with their servants who all live with Elizabeth and travel with her.
Privy Council	The chief advisors of Elizabeth, usually the most important landowners and nobles.
Parliament	A law-making body who's main power was to raise taxes for the monarch.
Lord-Lieutenant	The queen's representative in a specific area of England. Responsible for settling disputes and collecting taxes.
Justice of the Peace	A kind of judge. Each county had several and these were responsible for enforcing the laws.

Timeline

Elizabeth's accession	1558	Elizabeth becomes queen aged 25.
Parliament discusses marriage	1566	Parliament begins to openly discuss the suitors for Elizabeth.
The Northern Rebellion	1569	Several earls from northern England rebel against Elizabeth.
The Ridolfi Plot	1571	A plot to put Mary, Queen of Scots on the throne involving the Duke of Norfolk.
Death of Walsingham	1590	Sir Francis Walsingham, Elizabeth's spymaster, dies.
Essex goes to Ireland	1599	The Earl of Essex is sent to Ireland as Lord-Lieutenant to deal with the rebellions there.
Essex's Rebellion	1601	Essex gathers supporters and rebels against Elizabeth in London.
Elizabeth's death	1603	Elizabeth dies leaving no heir and the Tudor Dynasty ends.

Important People

Queen Mary I of England	Elizabeth's elder sister and the Catholic Queen of England. Elizabeth became queen on her death.
Mary, Queen of Scots	A cousin of Elizabeth and the Catholic Queen of Scots. Heir to the English throne whilst Elizabeth remained childless.
Sir Francis Walsingham	Elizabeth's spymaster and member of the Privy Council.
Sir William Cecil	One of Elizabeth's most trusted advisers and member of the Privy Council.

What changed over the period?

Elizabeth never expected to become Queen of England. As the second daughter of Henry VIII, she was after his son Edward and his elder daughter Mary in the line of succession, and she became queen after both died without children. As a Protestant and a woman, Elizabeth faced many threats to her reign and had to control England by many methods, including maintaining a delicate balance of fear and respects amongst her nobles as well as the actions of Sir Francis Walsingham, her spymaster.

Always Remember…

- Elizabeth was protestant but England was made up of a mixture of Catholics and Protestants, both of whom distrusted each other.
- There were many suitors for Elizabeth including Robert Dudley, Earl of Leicester and King Phillip II of Spain. However she never married and produced no heirs.
- As the next in line of succession and a Catholic, Mary, Queen of Scots presented a constant threat to Elizabeth's reign.

Exam Questions

Explain what was important about the execution of Mary, Queen of Scots in 1587. (8)

Write an account of the ways in which rebels plotted against Elizabeth. (8)

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Remember there are also a source question and a location study question in this exam – find examples at https://www.aqa.org.uk/subjects/history

Subject: History Year 11 Topic: Life in Elizabethan Times

Key Vocabulary…

Golden Age	A period of rapid advancement in the arts, sciences and culture.
Architecture	The art of building design.
Gentry	The landowning class who do not hold noble titles such as 'baron'.
Patronage	Protection and wealth given by a person of higher social status.
Poverty	Living without the ability to afford the basic essentials of life such as food and shelter.
Famine	A period of poor harvests in which there are food shortages and starvation.
Poor Law	The Government's policies in order to deal with the problem of poverty.
Privateer	A person who uses their ship to attack the ships and ports of other countries with the permission of their own government.

Timeline

Elizabeth's accession	1558	Elizabeth becomes queen aged 25.
Birth of Shakespeare	1564	William Shakespeare, the most famous English writer of all time is born in Stratford-upon-Avon.
Vagabond Act	1572	Law which meant that actors who do not belong to a licensed company are classed as beggars.
Statute of Apparel	1574	Law which controls the clothes people are allowed to wear based on their social rank.
First Poor Law	1597	The government starts to try to officially combat poverty.
The Globe Theatre opens	1599	The famous purpose-built theatre opens on London's Southbank and begins to show plays.
Act for the Relief of the Poor	1601	The government reissues the Poor Law with more powers.
Elizabeth's death	1603	Elizabeth dies leaving no heir and the Tudor Dynasty ends.

Important People

William Shakespeare	The most famous English playwright of all time. His plays dominate Elizabethan Culture.
Sir Francis Drake	A famous Elizabethan explorer and privateer. He was the first Englishman to sail around the world.
Sir Walter Raleigh	An English soldier who sent expeditions to American to colonise new land.
John Hawkins	The cousin of Sir Francis Drake, he explored with Drake and the pair also traded slaves.

What changed over the period?

The Elizabethan government and gentry started to take a serious interest in solving poverty as poor people was seen as a threat to organised society. That said, this period has widely been considered to be a 'Golden Age'. This is because there were huge developments in the arts such as literature and theatre as well as architecture and the sciences. England started to look outwards and the foundations of the British Empire were laid in the exploration of this time.

Always Remember…

- The gentry became a powerful social class at this time due to increases in the availability of land after the dissolution of the monasteries.
- Wealth and fashion became important symbols of status in society.
- Poverty increased hugely at this time, leading the government to involve itself in the lives of ordinary people.
- Acting became a recognised profession.

Exam Questions

Explain what was important about the theatre in Elizabethan England. (8)

Write an account of the ways in which Elizabeth dealt with the problem of the poor. (8)

Remember there are also a source question and a location study question in this exam – find examples at https://www.aqa.org.uk/subjects/history

Subject: History Year 11 Topic: Trouble at Home and Abroad

Key Vocabulary…

Catholic	A Christian who follows the teachings of the Pope as head of the Church.
Protestant	A Christian who does not follow the teachings of the Pope as head of the Church.
Rebellion	An uprising in defiance of the authority of the government.
Circumnavigate	To travel all the way around a circle or sphere.
Armada	A Spanish word meaning a large fleet of military ships.
Religious Settlement	Queen Elizabeth's original policy which allowed Catholics in England to worship in private.
Papal Bull	A pronouncement of Church law made by the Pope of the Catholic Church.
Treason	A crime against the country, usually an attack on the king or queen or helping an enemy country.

Timeline

Elizabeth's accession	1558	Elizabeth becomes queen aged 25.
The Northern Rebellion	1569	A rebellion of northern lords who held an illegal Catholic mass in Durham Cathedral.
The Papal Bull	1570	A commandment from the Pope that all Catholics should act against Elizabeth.
The Ridolfi Plot	1571	A plot against Elizabeth led by Norfolk and an Italian banker called Ridolfi.
The Throckmorton Plot	1583	Another Catholic plot led by Sir Francis Throckmorton and involving the Spanish ambassador.
Elizabeth sends troops to fight the Spanish	1585	Elizabeth started to send thousands of troops to the Netherlands to fight the Spanish.
The Babington Plot	1586	The plot which led to the execution of Mary, QoS.
Elizabeth's death	1603	Elizabeth dies leaving no heir and the Tudor Dynasty ends.

Important People

Mary, Queen of Scots	The Catholic cousin of Elizabeth who was next in line for the English throne.
Pope Pious V	The Pope who issued the Papal Bull and tried to covert England's Protestants back to Catholicism.
Anthony Babington	A member of the English gentry who plotted against Elizabeth with Mary, QoS, leading to her execution.
Edmund Campion	A famous English Jesuit who spoke out against Elizabeth.

What changed over the period?

Early in Elizabeth's reign the Religious Settlement allowed Catholics to worship how they wished in private. Elizabeth said 'I have no wish to make windows into men's souls.'
Later in her reign, there were several Catholic plots to kill her or overthrow her and this allowed the puritans within the Privy Council to convince her to enact harsher restrictions on Catholics. It became illegal for Catholics to have a Catholic priest in their home or even to travel more than 5 miles from their home.

Always Remember…

- Mary, Queen of Scots was the legal heir to the English throne but as a Catholic this would have thrown the Kingdom into chaos.
- Mary was executed after her involvement in the Babington Plot, but Elizabeth was reluctant to kill a fellow queen as this would send the wrong message to the lower classes.

Exam Questions

Explain what was important about the Papal Bull issued in 1570. (8)

Write an account of the ways in which Spain was involved in plots against Elizabeth. (8)

Remember there are also a source question and a location study question in this exam – find examples at https://www.aqa.org.uk/subjects/history

Topic A Relationships

Subject RE Year 11

Key Vocabulary…

Heterosexual	Relationship between members of the opposite sex
Homosexual	Relationship between members of the same sex
Marriage	The legal joining of two people in a life long, committed relationship
Divorce	The legal ending of a marriage
Adultery	Have sex with a married person who is not their husband or wife
Pre-marital sex	Sex before marriage
Cohabitation	Living with someone in a sexual relationship without being married
Nuclear family	A traditional family with two parents and children
Extended family	A family that's includes grandparents & other relatives beyond parents and children
Step family	Two families joined together through divorce
Polygamy	A man who has more than one wife. This is illegal in the UK
Monogamy	Being married to one person
Sanctity of marriage vows	Promises made in front of God in church in the marriage ceremony

Picture This…

Sanctity of marriage	Wedding rings symbolise the eternal nature of marriage for Christians: "Until death parts us." Marriage is a gift from God and parts of God's plan for humanity.
Nikah	Marriage is a social contract that brings two families together in Islam, that impacts on the whole community. Marriage is a faithful, lifelong commitment that is part of Allah's' plan for humanity.

Always Remember…

Christians and Muslims believe adultery is wrong. Sex is a gift from God that requires the commitment of marriage. Family life is important to religious people to raise children in a stable environment as good Christian and Muslims.

Deeper Learning…

Create a connection map to show knowledge about Christian and Islamic beliefs about the role of the family and the type of relationships the religion values.

Sacred writings

Christianity: "In sickness and in health, until death parts us." — Sacred writings are sources of authority

Christianity: "Your body is a temple of the Holy Spirit." (Bible) — Sacred writings are sources of authority

ristianity: "You shall not commit adultery." — Sacred writings are sources of authority

Christianity: "Love one another." (Greatest Commandment) — Sacred writings are sources of authority

Islam: "There is no institution in Islam more beloved to God than marriage." (Quran) — Sacred writings are sources of authority

Islam: "Do not go anywhere near adultery; it is an outrage an evil path."

Islam: "Heaven is under the feet of mothers." (Quran) — Sacred writings are sources of authority

Christianity: "Honour your father and mother.." (Bible) — ed writings are sources of authority

Christianity: "Anyone who divorces their wife/husband and marries against commits adultery. ." — Sacred writings are sources of authority

Christianity: A man leaves his parents to be united with his wife and they become one flesh." — Sacred writings are sources of authority

Activity – Plan your evaluation answer to 12 mark questions.

1. "It's not always wrong to have sex outside of marriage." 2. "Marriage gives more stability to society than cohabitation" 3. "Divorce is never right."

GCSE Music: Area of Study 1 – Musical Forms and Devices

The Baroque Era: 1600-1750

Main composers: Bach, Handel, Vivaldi, and Purcell

Main features of the music:
- Use of ornaments and terraced dynamics.
- Energetic rhythmic movement.
- Major/Minor key system (diatonic).
- Orchestras are mainly strings.
- Use of harpsichord, recorders, flute and
- horns.
- Use of basso continuo (see AOS2)

The Classical Era: 1750-1810

Main composers: Mozart, Beethoven, and Haydn

Main features of the music:
- Four sections to the orchestra.
- Melodies less complex than Baroque.
- More variety and contrast in the music.
- Frequent changes in mood, timbre and
- dynamics.

The Romantic Era: 1810-1910

Main composers: Chopin, Wagner, and Tchaikovsky

Main features of the music:

- Thematic ideas and use of the leitmotif.
- Increased variation in dynamics.
- Use of chromatic notes and extended chords.
- Further expansion of the orchestra.
- Development of the brass section.
- Descriptive music and links to other art forms

Musical Form and Structure

In GCSE music, you must be able to identify the following forms:

- Binary from – A B
- Ternary form – A B A
- Rondo form – A B A C A
- Minuet and Trio – Minuet Trio
- Minuet
- Variation from – Theme Variation 1,
- 2, 3 etc.
- Strophic form – A A A A

Other key terms

- **Monophonic** – One unaccompanied part or voice.

- **Homophonic** – Many parts that move together. Melody and accompaniment is a type of homophonic texture.

- **Polyphonic** – 2 or more different parts that are of equal importance.

- **Unison** – All together. Could be considered monophonic if played at the same pitch.
- **Parallel motion** – Parts move in the same direction.
- **Contrary motion** – Parts move in different directions.
- **Interval** – The gap/space between 2 different notes.

- **Repetition** – The exact repeat of a musical idea.
- **Contrast** – A change in the musical content.
- **Anacrusis** – A lead in. A note or beat before the first full bar of a piece.
- **Imitation** – When a musical idea is copied in another
- part.
- **Sequence** – The repetition of a motif (short melody) in
- the same part but at a different pitch.
- **Ostinato** – A musical pattern repeated many times. This is known as a riff in modern music.
- **Syncopation** – Off beat or where the weaker beats of a rhythm are emphasised.
- **Dotted rhythms** – A dot placed after a note. This increases the note by half its own value, giving a jagged effect to the rhythm.
- **Drone** – A repeated or sustained note or notes held throughout a passage of music. The drone will be diatonic and use either the Tonic or the Tonic and Dominant notes.
- **Pedal** – A held or repeated note, against which changing harmonies are heard.
- **Canon** – A device in which a melody is repeated exactly in another part while the initial melody continues and develops.
- **Conjunct movement** – When the melody mainly moves in step.
- **Disjunct movement** – When the melody 'leaps' from one note to another.
- **Broken chord/Arpeggio** – A chord played as separate notes.
- **Alberti bass** – A type of broken chord accompaniment.
- **Regular Phrasing** – The balanced parts of melody.
- **Motif** – A short melodic or rhythmic idea that has a distinctive character.
- **Modulation** – The process of changing key.

GCSE Music: Area of Study 2: Music for Ensembles

Timbre, Sonority and Texture

- **Timbre** - The tone colour or tone quality associated with a particular instrument. Refer to your instrument recognition sheet for more detail.
- **Sonority** - The relative loudness and 'feel' of a sound when compared with other sounds.
- **Texture** - The number of layers/parts in piece and how they relate to each other:
- **Monophonic** - A single melodic line with no accompaniment
- **Homophonic** - Many parts that move together (same rhythm).
- **Polyphonic** - Several different melodic lines heard independently of each other.
- **Unison** - When 2 or more musical parts that are the same, are played together (monophonic).
- **Chordal** - A type of texture where the parts move together producing a series of chords (homophonic).
- **Layered** - when more parts are added on top of each other to produce a richer texture.
- **Melody and accompaniment** - A type of homophonic texture, where the tune is the focus and is accompanied by other parts that move together.
- **Countermelody** - When a new melody is heard at the same time as a previous melody.
- **Round** - A type of canon in which voices sing the same melody but beginning at different times. The music repeats (goes round & round).

The word ensemble applies to the number of performers in a group. An ensemble may group together any combination of instruments from the same family or different families.

- Duet - 2 performers
- Trio - 3 performers
- Quartet - 4 performers
- Quintet - 5 performers
- Sextet - 6 performers
- Septet - 7 performers
- Octet - 8 performers

Basso Continuo - A type of accompaniment used in the Baroque era. The term means '**continuous bass**' and consisted of a bass instrument and a chordal instrument.

Baroque Sonata - A piece of music that is played rather than sung.
Trio Sonata - A piece of instrumental music for 3 parts.

String quartet - One of the most popular types of ensemble with in the Classical era. It consisted of 2 violins, a viola and a cello.

Musical Theatre

In musical theatre, the music helps tell and support the storyline and characterisation. The audience will see the storyline or plot unfolding through the music, the acting and the dance, supported by the accompanying orchestra/band. Different types of musical. Can you research an example of a musical for each type?

- Musical drama
- Disney musical
- Classic musical
- Romantic musical
- Musical comedy
- Sung-through musical
- Juke box musical
- Film-to-stage musical

Jazz and Blues

Jazz and Blues are styles of music that emerged at the start of the 20th century in America.

- Blues scale - A minor pentatonic scale with an extra note (flattened 5th).
- Improvisation - When music is spontaneously created during a performance.
- 12 Bar Blues - A type of structure used in Jazz and Blues that consists of 12 bars.
- Swing style - Characteristic of Jazz, in which notes are played with a relaxed dotted feel.
- Riff - A short motif or pattern that is repeated.
- Rhythm section - Typically consists of a bass player, a drummer and someone playing chords (pianist or guitarist).
- Standard - A Jazz or Blues song that is popular.

GCSE Music: Area of Study 3: Film Music

The Film Industry

Main categories of films:

- Action
- Adventure
- Animation
- Biography
- Documentary
- Children's film
- Comedy
- Crime
- Disaster
- Fantasy
- Horror
- Musical
- Mystery
- Romance
- Sci-fi
- Spy
- Thriller
- War
- Western

Diegetic – The music is heard as part of the storyline, e.g., music heard on a speaker during the scene.

Non-Diegetic – Background music that supports the onscreen action. It is only heard by the audience.

Use of Musical Elements

Melody – This adds character and shape to musical ideas. It is common in film music to have a variety of different themes of equal importance. An important melodic theme will often be referred to as a **Leitmotif.**

Tempo – This will often reflect the action on the screen.

Metre – The time signature used – how many beats in each bar and what type of beats they are.

Rhythm – Different length durations of notes and rests to create a pattern. There are many rhythmic devices used in film music – please refer to your film music PowerPoint resource.

Harmony – The way in which chords are used to create interest and complexity to the music.

- Diatonic – Chords that use notes from a specific key.
- Chromatic – Use of notes that are not in the key.
- Dissonant – Chords that use notes that do not 'fit' together well.
- Intervals – The gaps between notes. Some intervals are very effective in film music in creating a certain mood, atmosphere and tension.
- Fanfare – A short musical flourish or call to attention based on chords. It is often associated with an announcement or significant event.

Tonality – This refers to whether the music is Major, Minor or Atonal (no key/tone).

- Atonal – No sense of a tonic or 'home' key. Often use by composers to create an unsettling feeling.

Musical Devices and Techniques

Leitmotif – A short musical theme or idea that is associated with a character, place, object or situation – often abbreviated to 'motif'.
Ostinato – A short repeating musical idea. In film music this could be a melody, rhythm or chord sequence. Often, other parts will be layered over the ostinato to emphasise a build up of the action or tension in the film.
Riff – Similar to the ostinato. The word riff indicates music from a popular or modern genre.
Minimalism – A style of music characterised by the repetition of small cells of music, which evolve very gradually to create a hypnotic effect. Often used by film composers to establish the mood of a scene.

How music is used in film

- To create an atmosphere.
- To create a specific or geographic setting.
- To set the era, time or period, e.g., the use of classical music for a film set in the 18th century.
- To support the physical action and control the pace.
- To support the emotions of the characters and evoke certain emotions in the audience.
- To generate tension and build suspense.
- To support characters, situations and places using a leitmotif.
- To predict events or inform the audience of impending events, e.g., when the Jaws theme is heard, but the shark has not yet been seen in the film. The audience are aware of the forthcoming danger, but the on-screen characters are not.
- To create a sense of space, breadth, depth i.e., the 'size' of something.

GCSE Music: Area of Study 4: Popular Music

Styles/Genres

Rock- A genre that can sound quite aggressive but also can contain ballad-type tracks.

Pop- A commercial genre that has a mass audience appeal.

Bhangra- A type of fusion that features music from the Punjab region of India combined with other popular styles of music.

Fusion- When two or more musical genres are blended.

Theory- Melody, Harmony & Structure

Cadences	
Perfect	V-I
Imperfect	I-V
Plagal	IV-I
Interrupted	V-vi

Scale degrees	
Tonic	I
Sub-dominant	I V
Dominant	V

Strophic	A, A, A		
32-bar song form	A, A, B, A		
Verse - Chorus form	A, B, A, B, B		
12 bar blues			
I	I	I	I
IV	IV	I	I
V	IV	I	I

- **Ostinato-** A repeated melodic, rhythmic, or harmonic pattern in the music.
- **Sequence-** Repetition of a melodic or harmonic phrase in the same part, but at a higher or a lower pitch.
- **Syncopation-** Notes accented off the beat, the weak part of the beat is often emphasised.
- **Staccato-** Notes are to be played short and detached.
- **Chromatic-** Notes that don't belong in the key of a piece.
- **Broken chords-** Where the notes of a chord are played individually, one after another, rather than all at once.
- **Pedal-** A single note that is held or repeated (usually in the bass part).
- **Riff-** A repeated device (chordal pattern, series of notes or a musical phrase).
- **Improvisation-**When music is made up 'on the spot' and not played from preconceived notation.
- **Conjunct-**Melodies created by moving step-by-step
- **Disjunct-**The opposite of conjunct: where melodies are created by leaps.
- **Syllabic** -Each syllable is matched to a single note.
- **Melismatic-** Spreading one syllable between several different notes.
- **Glissando-** Sliding up or down the notes.
- **Reverb-** A technological effect that adds a 'warmth' and 'sense of space'.
- **Delay-** An audio effect that creates an 'echo' to an instrument or track.

Song Structure

- **Intro-** The start or opening of a song.
- **Verse-** Usually follows the introduction and sets the mood or style. When the section is repeated lyrics often change however the melody remains the same.
- **Pre-chorus-** A section that creates a build-up from the verse into the chorus.
- **Chorus-** This section usually contains the songs main message, major hook, and title. It is the catchiest, most memorable part of the song.
- **Bridge-** This is a transitional or link section to provide a contrast or new musical ideas.
- **Instrumental-** Often features a solo instrument that may play the melody of the song or improvise over a chord progression.
- **Outro-** The end of a song.

Theory- Major keys & the relative minor

Keys		
	C major	**A minor**
#	G major	E minor
##	D major	B minor
###	A major	F# minor
####	E major	C# minor
b	F major	D minor
bb	Bb major	G minor
bbb	Eb major	C minor
bbbb	Ab major	F minor

Instruments
Drum kit
Bass guitar
Electric guitar
Acoustic guitar
Keyboard
Organ
Synthesiser
Vocals
Backing Vocals

Time Signatures			
2/4	3/4	4/4	5/4
3/8	6/8	9/8	12/8

GCSE Physical Education – Aerobic/Anaerobic and long term effects of exercise

Aerobic and Anaerobic exercise – two methods of energy production by the body (Energy: the capacity to do work)
Two factors determine which method is used: **Intensity & duration**

Aerobic energy production – takes place in the presence of oxygen

glucose + oxygen → energy + carbon dioxide + water

Exercise intensity is moderate/low for a sustained period of time. *i.e. marathon runner/endurance cycling*

By products are released as sweat and CO2 exhaled.

Anaerobic energy production – takes place in the absence of oxygen

glucose → energy + lactic acid

Intensity of anaerobic activity is high as muscle contraction are powerful & quick
i.e. 100m sprinter/long jump

By product (lactic acid) builds up and causes fatigue.

Cardiovascular system
Cardiac equation – Cardiac output (Q) = Stroke Volume (SV) x Heart Rate (HR)

Long term effects of exercise

1. Cardiac hypertrophy – (left ventricle) this is the increased size of the heart due to training. This impacts on the cardiac equation above.

   Lower resting HR - Increased maximum Q - Increased SV

2. Increased elasticity in the walls of arteries and veins – more efficient constriction and dilation.
3. Increased number of red blood cells – has capacity to carry more oxygen to working muscles.
4. More efficient 'vascular shunt'
5. More capillaries
6. Lower blood pressure at rest

Skeletal system

Long term effects of exercise

1. Increased bone density – strong bones reduce the risk of injuries.
2. Increased strength of ligaments and tendons – allows the body to change direction quickly without injury occurring.

Respiratory system

Long term effects of exercise

1. Increased capilliarisation – better blood supply around the alveoli.
2. Increased number of alveoli – results in better gaseous exchange (oxygen delivery and waste product removal)
3. Increased strength of diaphragm and intercostal muscles – this increased tidal volume and vital capacity.
4. Increase in vital capacity

Muscular system

Long term effects of exercise

1. Muscular hypertrophy – increase in muscle size and strength/endurance.
2. Increase size and number of mitochondria – produces more energy aerobically.
3. Increased tolerance to lactic acid – reduces muscle fatigue.

How Sport is Covered Across the Media

Progress Vocabulary: *Identify, Define, describe, explain, compare and contrast, sporting links, analyse, evaluate*

Television

Terrestrial	Terrestrial TV is free to watch as long as you have a TV License. You can watch channels such as BBC, ITV and Channel 4. Some international matches are shown on these channels, along with the FA Cup Final.
Satellite	Satellite TV is usually paid for through a monthly subscription. It includes channels such as Sky Sports and BT Sport. This allows you to watch Premier League games for both football and rugby.
Pay Per View	Pay Per View involves paying a one off fee to watch a match or event. They are usually boxing matches and can be bought from Sky Sports Box Office or BT Sport Box Office.

Written Press

Newspapers	Newspapers cover sport in the back section. They mainly focus on football, rugby and cricket, but do give some coverage to other sports.
Magazines	Sports magazines usually offer coaching tips, information on the latest equipment and interviews with professionals.
Fanzines	Fanzines are magazines written by fans for fans. They usually include interviews, match reviews and information on the team.
Books	Sports books can be in the form of autobiographies, books on the history of the game or a certain team and books on tactics.

Internet

Social Media	Players and teams often use social media to engage with fans and keep them up to date.
Podcasts	Podcasts can be listened to online and discuss various topics in sport.
Blogs	A blog discusses different topics in sport, they usually focus on one sport.
Live Streams	Live streams allow people to watch a match live online.
P2P Sharing	Peer to Peer file sharing is a way to watch videos online.
Fan Sites	Fan websites are created by fans for fans.
Video-sharing Sites	A video sharing website allows people to access sport videos.

Radio

Internet Radio Stations	Most radio stations can also be listened to online.
National Radio Coverage	National radio coverage covers the whole country. They will usually cover some sport in their news section, but this will focus on the top teams.
Local Radio Coverage	Local radio stations cover a smaller area and will give more coverage to local teams.
Dedicated Sport Radio Stations	Sports radio stations give live commentary, interviews and often have opportunities to phone in.

Positive and Negative Effects that the Media can have on Sport

OCR Sport Studies

Positives

- Increased exposure of minority sports. For example, darts became more popular after Sky coverage.

- Increased promotional opportunities. Clubs can have their own TV channels and websites.

MUTV

- Education. Media coverage can help educate people on rules and techniques.

- Increased income which benefits sport. Income generated by the media can be invested in t[illegible]ies and youth programmes.

- Inspiring people to participate. Coverage of events such as The Olympics can encourage people to get involved in sport. Media coverage also gives us a lot of positive role models.

- Competition between sports and clubs. Competition for viewers means that clubs need to think more about the need customers and how they can attract more viewers.

Negatives

- Decline in live spectatorship. Sport is so easily accessible from home and online that this can lead to less people going to watch the game live.

- Loss of traditional sporting values. The media can put more pressure on athletes and teams to win which can work against sportsmanship.

- Media coverage of inappropriate behaviour of athletes. Inappropriate behaviour both on and off the pitch is often documented by the media. For example swearing and violent conduct on the pitch or behaving badly off the pitch.

- Increased pressure on officials. Decisions can often be scrutinised and hype around certain events can often make their job harder.

- Newspapers are dominated by a few sports. Male dominated sports are often featured more in newspapers.

- Saturation. There is so much sport coverage that some people may get fed up with it.

The Relationship Between Sport and the Media

Sport uses the media to promote itself. For example some high profile clubs have their own TV channel.

The media uses sport to promote itself. For example more people will buy Sky because they want access to the sport it offers.

Sport as a commodity. Many sports rely on the media as a source of revenue and it can also help attract wealthy owners.

Sponsorship and advertising. The amount of media coverage given to sport can help bring in more sponsors for clubs and athletes.

The adoption and rejection of sporting heroes can be influenced by the media. For example David Beckham is seen as a sporting hero.

Criticism through the media has increased. Sports performers and management are now much more exposed to the media.

Evaluating the Media Coverage of Sport

Progress Vocabulary: *Identify, Define, describe, explain, compare and contrast, sporting links, analyse, evaluate*

Aspects which may influence the coverage of a story

Tabloid ⟵ Type/brand of media outlet. ⟶ Broadsheet

Competition with other media outlets.
For example newspapers might try to write a different spin on a story.

Target audience.
A newspaper will try to report in a way that is relatable to its target audience.

Timing of the event/story.
If the issue or person is already in the news then each new revelation can be magnified.

Popularity or size of the individual or club being covered.
Some clubs or players may have a reputation and may be seen as an easy target and some powerful clubs or individuals may not be targeted.

Features of the coverage which may vary from one media outlet to another

Representation of the issue, organisation or individual involved.
e.g what is the focus of the story

Method of reporting.
e.g language/tone

Format/presentation.
e.g use of images, balance between text/images, headlines and captions

Potential bias.
e.g does the media outlet have something to gain by taking a certain stance

Extent of the coverage.
e.g how many pages are devoted to the story

Duration of the coverage.
e.g is the story revisited day after day

Knowledge Organiser – Live Performance Study

KEY VOCABULARY

Analyse – Examine something in detail.

Evaluate – Form an idea on something.

Communication – How ideas/ information is shared successfully.

Plot – The sequence of the main events.

Genre – The style of the drama.

Context – The previous circumstances that form the setting.

Sub-text – An underlying theme or message.

Conventions – The way the drama is put together.

Configurations – An arrangement of elements in a particular form.

Exemplification – To make something clear with an example.

Traits – The qualities of the character/person.

Always Remember

To get a better understanding try to watch the whole play not just the sections you will write about

You **CANNOT** write about Blood Brothers for this

Character includes: age, gender, status, relationships & attitudes

You will get 12 marks for describing your response to the performance and skills used

12

You will 20 marks for investigating how and why specific approaches were used

20

Decide between one **or** more actors in one **or** more scenes

Skills includes: voice, physicality, costumes, props, interaction, delivery of lines & use of space

You must focus on how meaning is communicated

Always consider how lighting, sound and set design influence the outcome

You must focus on the success of the production team

Always start your answer with an introduction detailing the name of the play, where and when it was performed.

PROCESS

WATCH – Repeatedly watch the performance

RESEARCH – Research the plot, characters, style, genre and context

UNDERSTAND – Understand how the performance is created and the effect on the audience

KEY TERMS

INTERPRET & COMMUNICATE

Conventions, use of space, stage configurations, relationship between performers and audience, set design, costume, lighting, sound, performers use of voice, performers use of physicality.

CHECK YOUR PROGRESS

I have demonstrated **excellent** knowledge and understanding of how theatre is developed and performed.

I have referred to an **extensive** range of skills that are **appropriate** to the question.

I use **exact, well developed** and **supported** description throughout with **precise** detail.

I demonstrate highly developed skills in identifying and investigating how successfully theatre makers communicate meaning.

My response shows highly developed skills in assessing the merit of approaches.

My response is critical and insightful.

My points are fully explored and supported with thorough exemplification

BREAKDOWN

Introduction on the play – narrative, context, characters, when it was performed and where. General description of the style and presentation of the production.

Describe in detail the vocal and physical skills used by each actor (if chosen more than one) in each of the scenes (if chosen more than one).

Analyse and evaluate each of the above actors and scenes for their success in communicating their ideas and emotions to the audience.

Knowledge Organiser – Scripted Drama

KEY VOCABULARY

Pitch – How high or low your voice is.

Pace – The speed at which you speak or move.

Tone – How you want to sound, usually an emotion or feeling.

Emphasis – Drawing attention to a word, phrase or movement by adjusting it.

Interpretation – Your end product based on how you understood the meaning.

Intention – This is what you aim to achieve.

Established – Something well thought out, planned and consistent.

Demeanor – The way your character behaves to convey feeling or emotion.

Refine – To improve something with minor changes.

Dramatic aim – Choices you make to communicate meaning or ideas.

Impact – A strong effect or influence.

CHECK YOUR PROGRESS

I have demonstrated an **extensive range** of skills.

My skills are deployed **precisely** and in a **highly effective** way.

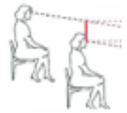
My personal interpretation is **entirely appropriate** to the play as a whole.

My personal interpretation is **highly sensitive** to the context.

I have **entirely achieved** my artistic intentions.

Always Remember

The sightline is the view of the **audience**



You are always assessed as an individual

You get separate marks for each performance in your exam

You must learn all of your lines you cannot adlib.

To get a better understanding try to read the whole play not just the sections you perform

Use your creativity but remember to remain appropriate to the context

Split your character's aims up into the extract, smaller sections and even each line to achieve the best impact

Try improvising around your script to explore your character and the context of the scene

Experiment with a range of performance skills to create the most effective and appropriate character

Demonstrate internal and external energy throughout no matter how many times you have done it before

The examiner is a stranger and you will only get to perform once!

YOUR OBJECTIVES

- Remember all your lines.
- Remember all your movements.
- Understand the play from which the excerpts come.
- Project and vary your voice.
- Stay in character even when you are not speaking.
- Listen and react to others.
- Be confident about what comes next.
- Maintain your focus and energy throughout your performance.
- Establish your character by the way you speak and move.
- Create the world of the play through your use of the performance space.
- Achieve your artistic intentions for the role.

SKILLS TO CONSIDER

Pitch ***Pace*** ***Emphasis*** ***Tone*** ***Volume*** ***Pause***

Accent ***Facial Expressions*** ***Posture*** ***Gait***

Mannerisms ***Eye Contact/ Withdrawal*** ***Movement***

Proxemics ***Actions/ Gestures*** ***Direct Address***

Status ***Setting the Scene*** ***Open/ Closed Expression***

KEY QUESTIONS

Where do your extracts fit in the play as a whole?

What is the purpose of your character?

How will you create the setting?

Are your props and costume essential and appropriate?

What effect are you creating for your audience?

How far removed is your character from yourself?

Have you experimented with your vocal, facial and physical expression?

Are your character's reactions accurate?

Are you making the most of your staging?

Are you supporting your fellow performers?

Have you thought about drama techniques?