

Year 11

Knowledge Organiser

Autumn Term 2017

Section A : Core, Humanities, MFL, Sport and Computing

Characters

Macbeth	A loyal warrior who becomes obsessed with the witches' prophecies of power.	Loyal, Fearsome, Violent, Ambitious, Contemplative, Duplicitous, Tyrannical, Emasculate, Weak, Desirous, Psychotic, Dualistic, Rigidical
Lady Macbeth	Macbeth's wife who drives his ambition in the beginning but loses her control by the end.	Sycophantic, Manipulative, Persuasive, Ambitious, Strong, Ruthless, Sensual, Subversive, Dominant, Action-oriented, Powerful, Willful, Aggressive, Purposeful, Anarchic
Banquo	Macbeth's close friend and ally who also receives prophecies from the witches.	Brave, Loyal, Diplomatic, Virtuous, Friendly, Insightful, Astute, Shrewd, Sceptical, Apprehensive, Cynical
Duncan	King of Scotland at the beginning of the play who is portrayed as a strong and respected leader.	Fair, Respected, Naive, Trusting, Happy, Jolly, Jovial, Optimistic, Meek, Moral, Panglossian
Macduff	A brave warrior who is loyal to Duncan and is consistently suspicious of Macbeth.	Emotional, Courageous, Strong-willed, Righteous, Justice-oriented, Focused, Deliberate, Heroic, Responsive, Intuitive
Malcolm	Duncan's son and next in line to the throne.	Naive (at first), Dignified, Honest, Suspicious, Clever, Brave, Flexible, Open-minded
The Three Witches	Portrayed as forces of nature that seem to know the future and are fascinating to Macbeth.	Sinister, Evil, Supernatural, Unearthly, Eerie, Loud, Prophetic, Cryptic, Manipulative, Omniscient



Macbeth By William Shakespeare

Social, Historical and Literary Context

Macbeth: The Play	The plot is partly based on fact. Macbeth was a real 11C king who reigned Scotland from 1040-1057. Shakespeare's version of the story originates from the Chronicles of Holinshed , a well known historian. The play was written in 1606 – the year after the Gunpowder Plot of 1605 – and reflects the insecurities of Jacobean politics.
Shakespeare's Scotland (and England)	Queen Elizabeth I died in 1603, and King James VI of Scotland was crowned King James I of England. Women were entirely under the power of their husbands. Superstition was widespread and astrology was a legitimate science.
Belief in the supernatural	In Shakespeare's England, anxiety about witchcraft and belief in magic and the supernatural were not limited to the lower or uneducated classes. While king of Scotland, James VI became utterly convinced about the reality of witchcraft and its great danger to him, leading to trials that began in 1591.
Shakespearean Tragedy	Macbeth is one of Shakespeare's Tragedies and follows specific conventions. The climax must end in a tremendous catastrophe involving the death of the main character; the character's death is caused by their own flaw(s) (hamartia); yet, the character has something the audience can identify with.
The Great Chain of Being/ The Divine Right of Kings	The Great Chain of Being , a strict, religious hierarchical structure of all matter and life, believed to have been decreed by God, dominated Elizabethan beliefs. Divine right says that a Monarch is not subject to earthly authority, and that they have the right to rule directly from the will of God. The action of killing a King is called regicide .

Plot

Act 1

This Act opens with the three Weird Sisters setting up the entire theme of the play: Fair is foul and foul is fair. A war is taking place against Scotland (the setting of the play) and Norway. Scotland is victorious due to the valiant efforts of Macbeth. The traitorous Thane of Cawdor is captured and executed. King Duncan rewards Macbeth with the title of Thane of Cawdor. The three Weird Sisters confront Macbeth and Banquo, telling Macbeth that he will become **Thane of Cawdor, Glamis and eventually king**. Macbeth soon learns of his new title fulfilling the first part of the prophesy and sends word to his wife. Duncan plans on staying the night at Macbeth's castle in **Inverness**. Lady Macbeth receives the news and immediately plots the death of King Duncan so her husband will be king. Lady Macbeth manipulates Macbeth into following her plans, and he reluctantly agrees to murder Duncan. By the end of Act I, Macbeth is determined to follow through with the plan.

Act 2

Macbeth again has some doubts (and visions) but he talks himself into following through with the murder. Macbeth is so scared Lady Macbeth must finish the rest of the plan by wiping blood on the drunk guards. The next morning, Macduff and **Lennox** arrive at Macbeth's and Macduff discovers the dead body of King Duncan. The guards are immediately suspects and Macbeth kills them. Malcolm and **Donalbain**, the King's sons, flee the castle because they are afraid that they will be blamed for the murder of their father. The king is soon buried.

Act 3

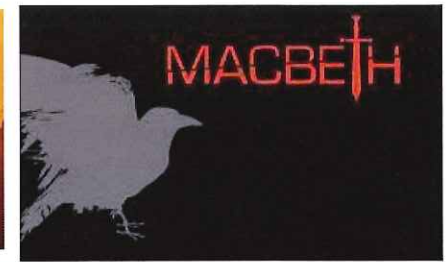
Banquo begins to suspect Macbeth for the murder of King Duncan and Macbeth in turn feels that Banquo will reveal that it was he that killed the King. Therefore, Macbeth sends out some thugs to murder Banquo and his son, **Fleance**. Banquo is murdered, but **Fleance** escapes. Macbeth, Lady Macbeth, **Lennox**, **Ross**, and other lords attend a banquet. The ghost of Banquo presents itself to Macbeth. Macbeth begins to rant and rave, making the other guests uneasy. Lady Macbeth tries to cover up the situation by saying Macbeth is prone to fits. By the end of this Act, we learn that Macduff has not attended the banquet because he has gone to England, looking for help because he is suspicious of Macbeth.

Act 4

Macbeth confronts the three Weird Sisters and they show him more visions. The visions lead Macbeth to believe that he cannot be killed by any man, giving him a false sense of security. He then plans to send murderers to the castle of Macduff (who is in England) in order to kill his family. Meanwhile, Macduff is in England begging Malcolm to return to Scotland and seize the throne from Macbeth, who has become a tyrant. Malcolm tests Macduff's loyalty to Scotland and himself and after being satisfied with Macduff's responses, he agrees to wage war against Macbeth. Malcolm's uncle, **Siward**, will also aid in the attack.

Act 5

Lady Macbeth has finally gone mad with guilt over the murders. The once strong and ruthless woman is now a scared child. Doctors are unable to help her. Some of the Scottish lords are discussing Macbeth's state of mind and have come to the conclusion that they will help Malcolm and Macduff fight against Macbeth. Of course, Macbeth isn't really concerned because he believes the prophecy ensures that he cannot be killed by any man born of woman. Macbeth soon confronts at **Dunsinane**. Macduff and learns that Macduff was ripped from his mother's side and not born naturally. Macbeth and Macduff fight and the natural order is restored by the end of the play.



Significant Aspects of Writer's Craft

Iambic Pentameter	The noble characters mostly speak in unrhymed iambic pentameter, like this: <i>ba-DUM, ba-DUM, ba-DUM, ba-DUM, ba-DUM</i> . It's the most common in English poetry. It doesn't rhyme, which is why it's referred to as blank verse. It tends to connote power, control, status and authority.	
Trochaic tetrameter	Trochaic tetrameter is a rhythmic pattern that consist of four 'trochees' per line. It sounds like this: <i>DUM-da, DUM-da, DUM-da, DUM-da</i> . The Witches speak in this verse, making it sound like an eerie chanting, e.g. <i>DOUble, DOUble, TOIL and TROUble / Flre BURN and CAULdron BUbble</i> .	
Prose	Commoners, or people who lack status, often speak in unrestrained prose. It sets them apart from the noble characters. These characters often discuss low and base content, such as sex and debauchery!	
Soliloquy	These are speeches but they are meant to be heard only by the audience. They tell us directly about a character's thoughts and feelings and they are very important in Macbeth, because we can understand exactly what is going through a character's mind.	
Symbolism	Blood	The image of blood runs through the play, both literally and imagined. Blood comes to symbolise Macbeth's growing guilt and is also a reminder of man's mortality. Blood, or menstruation, represents Lady Macbeth's rejection of her femininity – her womanhood.
	Dead children	This rather unpleasant theme has two purposes. Firstly, it symbolises how family lines come to an end. In this case, Macbeth tries to extinguish the family lines of his enemies. It reminds us of the shocking depths to which Macbeth allows himself to fall. Secondly, it supports the unnaturalness of Lady Macbeth's rejection of her own compassionate and maternal instincts.
	Light/Dark	Simply put, light is used to represent goodness, godliness and all things innocent and pure. Darkness carries the opposite connotations: evil, betrayal, death.

Basic Probability

EXAMPLE:

Work out the probability of randomly picking a letter 'P' from the tiles below.

APPLE PINE

- There are 3 P's — so there are 3 different ways to pick a letter P.
- And there are 8 tiles altogether — each of these is a possible outcome.

$$\text{Probability} = \frac{\text{number of ways to pick a P}}{\text{total number of possible outcomes}} = \frac{3}{8} \text{ (or } 0.375\text{)}$$

Probabilities Add up to One

$$P(\text{event happens}) + P(\text{event doesn't happen}) = 1$$

EXAMPLE:

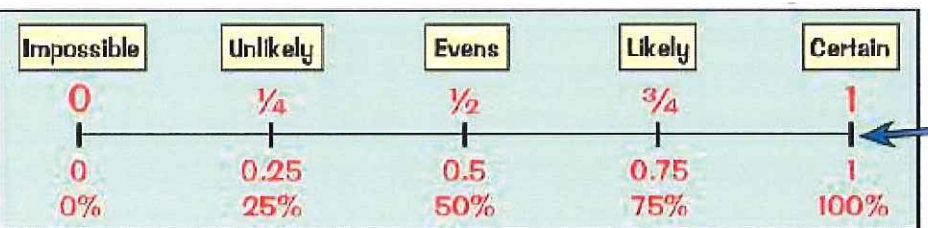
A spinner has different numbers of red, blue and green sections. Work out the value of x and use it to find the probability of spinning red or blue.

Colour	red	blue	green
Probability	$3x$	$2x$	$5x$

- The probabilities add up to 1. $3x + 2x + 5x = 1$ so $10x = 1$ and so $x = 0.1$
- Spinning red or blue is the same as not spinning green. $P(\text{red or blue}) = 1 - P(\text{green}) = 1 - (5 \times 0.1) = 0.5$

Presumably, just means the probability of that result.

Probability



Probabilities can be given as fractions, decimals or percentages.

EXAMPLE:

The spinners on the right are spun, and the scores added together.

- Make a sample space diagram showing all the possible outcomes.

- All the scores from one spinner go along the top. All the scores from the other spinner go down the side.

+	3	4	5
1	4	5	6
2	5	6	7
3	6	7	8

- Add the two scores together to get the different possible totals (the outcomes).

- Find the probability of spinning a total of 6.

There are 2 possible outcomes altogether, and 3 ways to score 6.

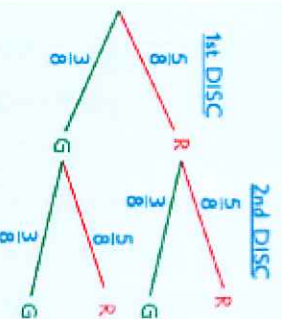
$$P(\text{total} = 6) = \frac{\text{number of ways to score 6}}{\text{total number of possible outcomes}} = \frac{3}{9} = \frac{1}{3}$$



There are 9 outcomes here — even though some of the actual totals are repeated.

Probability Trees

A box contains 5 red discs and 3 green discs. One disc is taken at random and its colour noted before being replaced. A second disc is then taken. Find the probability that both discs are the same colour.



The probabilities for the 1st and 2nd discs are the same. This is because the 1st disc is replaced — so the events are independent.

$$P(\text{both discs are red}) = P(R \text{ and } R) = \frac{5}{8} \times \frac{5}{8} = \frac{25}{64}$$

$$P(\text{both discs are green}) = P(G \text{ and } G) = \frac{3}{8} \times \frac{3}{8} = \frac{9}{64}$$

$$P(\text{both discs are same colour}) = P(R \text{ and } R \text{ or } G \text{ and } G) = \frac{25}{64} + \frac{9}{64} = \frac{34}{64} = \frac{17}{32}$$

Inequalities

$>$ means 'Greater than'

\geq means 'Greater than or equal to'

$<$ means 'Less than'

\leq means 'Less than or equal to'

...Solving

EXAMPLES:

1. x is an integer such that $-4 < x \leq 3$.
Find all the possible values of x .

Work out what each bit of the inequality is telling you:

$-4 < x$ means ' x is greater than -4 '.

$x \leq 3$ means ' x is less than or equal to 3 '.

Now just write down all the values that x can take.
(Remember, integers are just +ve or -ve whole numbers)

$-3, -2, -1, 0, 1, 2, 3$

2. Solve $6x + 7 > x + 22$.

Just solve it like an equation:

$$(-7) \quad 6x + 7 - 7 > x + 22 - 7$$

$$6x > x + 15$$

$$(-x) \quad 6x - x > x + 15 - x$$

$$5x > 15$$

$$(\div 5) \quad 5x \div 5 > 15 \div 5$$

$$x > 3$$

3. Solve $-2 \leq \frac{x}{4} + 3 \leq 5$.

Don't be put off because there are two inequality signs —
just do the same thing to each bit of the inequality

$$(-3) \quad -2 - 3 \leq \frac{x}{4} + 3 - 3 \leq 5 - 3$$

$$-5 \leq \frac{x}{4} \leq 2$$

$$(\times 4) \quad 4 \times -5 \leq \frac{4 \times x}{4} \leq 4 \times 2$$

$$-20 \leq x \leq 8$$

4. Solve $9 - 2x > 15$.

Again, solve it like an equation:

$$(-9) \quad 9 - 2x - 9 > 15 - 9$$

$$-2x > 6$$

$$(\div -2) \quad -2x \div -2 < 6 \div -2$$

$$x < -3$$

The $>$ has turned into a $<$, because
we divided by a negative number

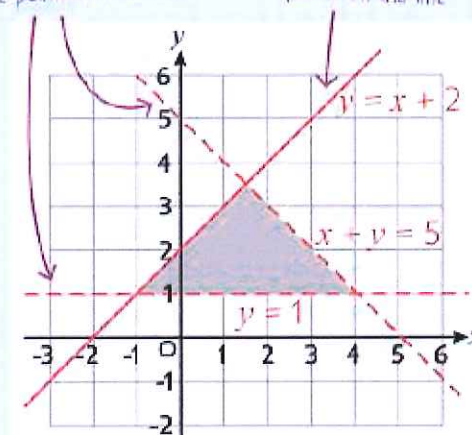
...On Graphs

Shade the region that satisfies all three of the following inequalities:

$$x + y < 5 \quad y \leq x + 2 \quad y > 1$$

Dotted lines mean the
region doesn't include
the points on the line.

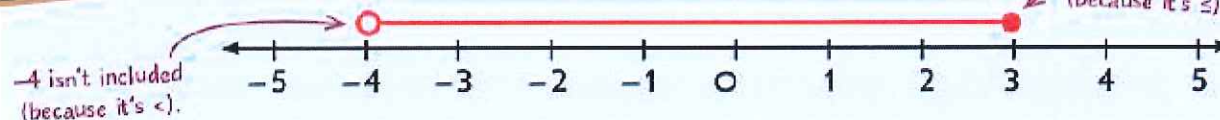
A solid line means the
region does include the
points on the line



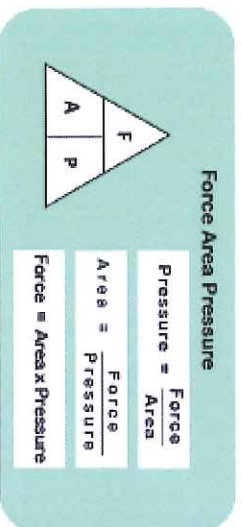
...On a Number Line

EXAMPLE:

Show the inequality $-4 < x \leq 3$ on a number line.



Compound measures



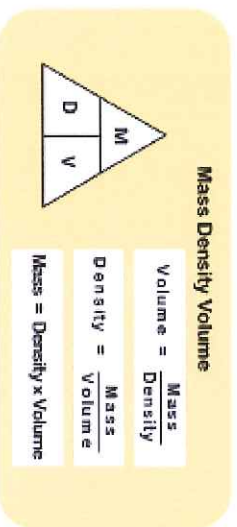
Examples

A force of 20N acted over an area of 2m^2 . What is the pressure?

$$\text{Pressure} = \frac{\text{force}}{\text{Area}} = \frac{20\text{N}}{2\text{m}^2} = 10\text{N/cm}^2$$

What is the force exerted on an area of 10m^2 that is under a pressure of 2.3N/m^2 ?

$$\text{Force} = \text{Area} \times \text{Pressure} = 10\text{m}^2 \times 2.3\text{N/m}^2 = 23\text{N}$$



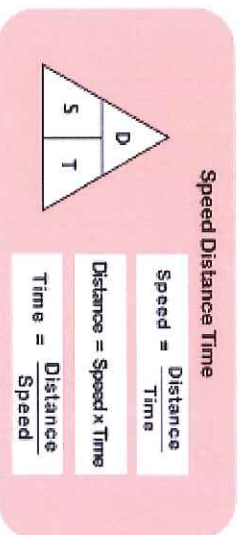
Examples

A piece of metal weighing 30g has a volume of 4cm^3 . What is it's density?

$$\text{Density} = \frac{\text{Mass}}{\text{Volume}} = \frac{30\text{g}}{4\text{cm}^3} = 7.5\text{g/cm}^3$$

What is the mass of a piece of rock which has a volume of 34cm^3 and a density of 2.25g/cm^3 ?

$$\text{Mass} = \text{volume} \times \text{density} = 34\text{cm}^3 \times 2.25\text{g/cm}^3 = 76.5\text{g}$$



Examples

What is the average speed of a car that travels 400km in 5 hours?

$$\text{Speed} = \frac{\text{distance}}{\text{time}} = \frac{400\text{km}}{5} = 80\text{km/h}$$

What is the distance covered by a train that travels at an average speed of 150mph for three and a half hours?

$$\text{Distance} = \text{speed} \times \text{time} = 150 \times 3.5 = 525\text{miles}$$

1 $\sqrt{a} \times \sqrt{b} = \sqrt{a \times b}$ e.g. $\sqrt{2} \times \sqrt{3} = \sqrt{2 \times 3} = \sqrt{6}$ — also $(\sqrt{b})^2 = \sqrt{b} \times \sqrt{b} = \sqrt{b} \times b = b$

2 $\frac{\sqrt{a}}{\sqrt{b}} = \sqrt{\frac{a}{b}}$ e.g. $\frac{\sqrt{8}}{\sqrt{2}} = \sqrt{\frac{8}{2}} = \sqrt{4} = 2$

3 $\sqrt{a} + \sqrt{b}$ — **DO NOTHING** — in other words it is definitely **NOT** $\sqrt{a+b}$

4 $(a + \sqrt{b})^2 = (a + \sqrt{b})(a + \sqrt{b}) = a^2 + 2a\sqrt{b} + b$ — **NOT** just $a^2 + (\sqrt{b})^2$

5 $(a + \sqrt{b})(a - \sqrt{b}) = a^2 + a\sqrt{b} - a\sqrt{b} - (\sqrt{b})^2 = a^2 - b$

6 $\frac{a}{\sqrt{b}} = \frac{a}{\sqrt{b}} \times \frac{\sqrt{b}}{\sqrt{b}} = \frac{a\sqrt{b}}{b}$

This is known as '**RATIONALISING the denominator**' — if's where you get rid of the $\sqrt{\quad}$ on the bottom of the fraction.



SURDS

EXAMPLES:

1. Write $\sqrt{300} + \sqrt{48} - 2\sqrt{75}$ in the form $a\sqrt{3}$, where a is an integer.

Write each surd in terms of $\sqrt{3}$:

$$\sqrt{300} = \sqrt{100 \times 3} = \sqrt{100} \times \sqrt{3} = 10\sqrt{3}$$

$$\sqrt{48} = \sqrt{16 \times 3} = \sqrt{16} \times \sqrt{3} = 4\sqrt{3}$$

$$2\sqrt{75} = 2\sqrt{25 \times 3} = 2 \times \sqrt{25} \times \sqrt{3} = 10\sqrt{3}$$

Then do the sum (leaving your answer in terms of $\sqrt{3}$):

$$\sqrt{300} + \sqrt{48} - 2\sqrt{75} = 10\sqrt{3} + 4\sqrt{3} - 10\sqrt{3} = 4$$

2. A rectangle with length $4x$ cm and width x cm has an area of 32 cm^2 . Find the exact value of x , giving your answer in its simplest form.

Area of rectangle = length \times width = $4x \times x = 4x^2$

So $4x^2 = 32$

$x^2 = 8$

$x = \pm \sqrt{8}$

You can ignore the negative square root (see p.22) as length must be positive.

'Exact value' means you have to leave your answer in surd form, so get $\sqrt{8}$ into its simplest form:

$$\sqrt{8} = \sqrt{4 \times 2} = \sqrt{4} \sqrt{2} = 2\sqrt{2} \quad \text{So } x = 2\sqrt{2}$$

3. Write $\frac{3}{2 + \sqrt{5}}$ in the form $a + b\sqrt{5}$, where a and b are integers.

To rationalise the denominator, multiply top and bottom by $2 - \sqrt{5}$:


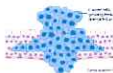



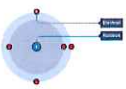





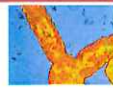







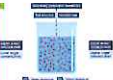
















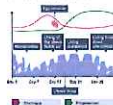

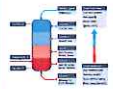

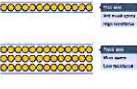


$$\begin{aligned} \frac{3}{2 + \sqrt{5}} &= \frac{3(2 - \sqrt{5})}{(2 + \sqrt{5})(2 - \sqrt{5})} \\ &= \frac{6 - 3\sqrt{5}}{2^2 - 2\sqrt{5} + 2\sqrt{5} - (\sqrt{5})^2} \\ &= \frac{6 - 3\sqrt{5}}{4 - 5} = \frac{6 - 3\sqrt{5}}{-1} = -6 + 3\sqrt{5} \quad (\text{so } a = -6 \text{ and } b = 3) \end{aligned}$$

Learn the 6 rules for manipulating surds, then give these Exam Practice Questions a go...

























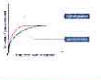










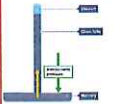



Q1 Simplify $\sqrt{180} + \sqrt{20} + (\sqrt{5})^2$ [3 marks]

Q2 Write $\frac{2}{2 + \sqrt{3}}$ in the form $a + b\sqrt{3}$, where a and b are integers. [3 marks]

Yr 11 Knowledge Organiser—Science

		<p><u>1. Health and disease</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> 1. Health 2. Non-communicable disease 3. CV disease 	<p><u>2. Acids and bases</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> 1. Acids and Ions 2. Strong and weak acids 3. Bases and salts 	<p><u>3. Atomic structure</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> 1. Atomic models 2. Isotopes 3. Ionisation 		
<p><u>4. Pathogens</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> 1. Pathogen types 2. Spreading pathogens 3. Barriers to patho- 	<p><u>5. Balancing chemical equations</u></p>  <p>Things to revise</p> <ol style="list-style-type: none"> 1. How to balance equations 2. State symbols 	<p><u>6. Radioactivity</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> 1. Background radiation 2. Types of radiation 3. Dangers of radiation 	<p><u>7. The immune system</u></p>  <p>Things to revise</p> <ol style="list-style-type: none"> 1. Immune system 2. White blood cells 3. Antibiotics 	<p><u>8. Neutralisation and titrations</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> 1. Ions and neutralisation 2. Titrations 3. Acids and metal reactions 		
<p><u>9. Half life</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> 1. Radioactive decay 2. Calculating half life 	<p><u>10. Photosynthesis</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> 1. Photosynthesis 2. Factors affecting the rate of photosynthesis 	<p><u>11. Absorbing water in plants</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> 1. Osmosis 2. Diffusion 3. Active transport 	<p><u>12. Electrolysis</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> 1. Half equations 2. Products of electrolysis 3. Electrolysis core practical 	<p><u>13. Work and Power</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> 1. Work 2. Power 		
<p><u>14. Transpiration</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> 1. Plant structures 2. Absorbing ions 	<p><u>15. Reactivity</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> 1. Reactivity series 2. Oxidation and reduction 3. Displacement reactions 	<p><u>16. Vector diagrams</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> 1. Parallelogram of forces 2. Scale drawings 	<p><u>17. Hormones</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> 1. Hormone types 2. Metabolic rate 	<p><u>18. Life cycle assessment</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> 1. Recycling metals 2. stages of use 		
<p><u>19. Current and potential difference</u></p>  <p>Things to revise</p> <ol style="list-style-type: none"> 1. Current 2. Energy changes 3. Series and parallel circuit rules 	<p><u>20. Menstrual cycle</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> 1. Hormones 2. Contraceptive pill 3. IVF 	<p><u>21. Crude oil</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> 1. Hydrocarbons and alkanes 2. Fractional distillation 3. Cracking 	<p><u>22. Resistance</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> 1. Series and parallel resistors 2. Ohms law 3. Types of resistor 	<p><u>23. Glucose control</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> 1. Diabetes 2. Insulin use 		

Yr 11 Knowledge Organiser—Science

<p>24. <u>Combustion</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> Equations Carbon monoxide poisoning Pollution 	<p>25. <u>Transferring Electricity</u></p>  <p>Things to revise</p> <ol style="list-style-type: none"> Energy transfer Power DC/AC Safety  	<p>26. <u>Transport and exchange</u></p>  <p>Things to revise</p> <ol style="list-style-type: none"> Gas exchange Surface area Alveoli adaptations 	<p>27. <u>Earth's Atmosphere</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> Historic atmosphere Changes to the atmosphere Current atmosphere 	<p>28. <u>Magnetism & electromagnets</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> Permanent magnets Electromagnets 	
<p>29. <u>Circulatory system</u></p>  <p>Things to revise</p> <ol style="list-style-type: none"> Heart structure Blood vessels Blood 	<p>30. <u>Climate change</u></p>  <p>Things to revise</p> <ol style="list-style-type: none"> Effects of change Limiting the effects 	<p>31. <u>Electromagnetic induction</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> Magnetic forces Electromotive effect 	<p>32. <u>Respiration</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> Aerobic respiration Anaerobic respiration 	<p>33. Groups in the periodic table</p>  <p>Things to revise</p> <ol style="list-style-type: none"> Group 1 reactivity Group 7 Reactivity Group 0 	<p>34. <u>Transformers</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> Uses of transformers Transformer equation
<p>35. <u>Ecosystems</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> Interdependence Food webs Population sizes 	<p>36. <u>Rates of reaction</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> Calculating rates Factors affecting rate Catalysts and activation energy 	<p>37. <u>Density</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> Particle model Density of regular/irregular shapes 	<p>38. <u>Abiotic and biotic factors</u></p> <p>Things to revise</p> <ol style="list-style-type: none"> Natural abiotic factors Pollution Predator-prey cycle Parasitism and mutualism  	<p>39. <u>Endo and exothermic reactions</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> Energy graphs Common temperature changes 	<p>40. <u>Heat energy</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> Changes of state Specific heat capacity
<p>40. <u>Cycles</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> Water cycle Carbon cycle Nitrogen cycle 	<p>41. <u>Gas Laws</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> Temperature and pressure Units of temperature 	<p>42. <u>Hooke's Law</u></p>   <p>Things to revise</p> <ol style="list-style-type: none"> Elastic and inelastic changes Hooke's Law Energy transfers 			
1					

Timeline

Britain: Power and the people

**Year 11 Autumn Term
Knowledge Organiser**

**British Thematic Study:
Power and the People
(a study over 800**

This thematic study covers over 800 years in the history of the relationship between the citizen and the state in Britain. Beginning in the twelfth century, you will explore how the power and authority of different kings and parliament have been challenged. By examining the journey from feudalism to democracy and equality, you will discover how, in different periods, the state has responded to challenges to its authority and the impact of this.

You will explore how the balance of power changed, why change happened when it did, whether change brought progress, and the significance of the changes. You will also consider how factors – such as war, chance, religion and the economy – sometimes worked together to bring about particular changes at a particular time.

And although the focus of this study is the development of the relationship between power and the people in Britain, it will show how ideas, events or developments in the wider world affected the course of Britain's political development.

1215
Magna Carta is signed by King John



1301
Local uprisings lead to the Peasants' Revolt; the leader, Wat Tyler, is killed



1819
The Peterloo Massacre: protestors demanding the vote are attacked by the authorities



**How have people challenged authority?
How have British people gone from
feudalism in the Middle Ages to the
democratic, equal society we have today?**

1981
Brixton Riots take place and lead to the Scarman Report into institutional racism in the police



1775–82
Britain's defeat in the War of Independence results in the loss of the American colonies

1838–48
Chartism movement tries to secure more representation for the working class

1833
Factory Reform Act reduces the amount of hours women and children can work

1918
Women over 28 get the vote

2000

1800

1900

1200

1300

1500

1600

1700

1642–51
English Civil War occurs between those who support King Charles I and those who support parliament



1536–37
People from the north of England start a pilgrimage to protest about King Henry VIII's changes to the Church

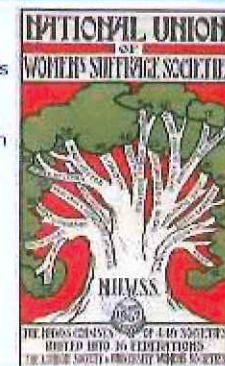
1265
Simon de Montfort calls a parliament that has 'commoners' in it

1804
Toussaint L'Ouverture leads a rebellion against slavery; the new independent island of Haiti is created



1834
Tolpuddle Martyrs are arrested for holding a union meeting

1897
The National Union of Women's Suffrage Societies is set up; the campaign for women's suffrage becomes organised



1948
Empire Windrush arrives in Britain, beginning a new wave of West Indian migration to the country

1926
General Strike takes place in support of British miners

KEY TERMS, PEOPLE AND DEFINITIONS

CHALLENGING AUTHORITY AND FEUDALISM

BARON	Title of honour/nobleman. The title came with land attached.
KING JOHN	King of England 1199-1216. Barons revolted against him, resulting in signing of Magna Carta.
MAGNA CARTA	'Great Charter' made peace between unpopular King John and rebel barons. Promised the protection of church rights, protection for the barons from illegal imprisonment, access to swift justice, and limitations on feudal payments to the Crown.
FEUDALISM	Medieval system of land holding and distribution, in which goods/service are exchanged for land (see diagram).
HENRY III	Ruled from 1216 until 1272. In 1242, Henry's half-brothers involved him in an expensive military venture in France. Parliament demanded the council to act as 'conservators of liberties' and oversee royal finances. In 1258 a bungled deal with the Pope threatened Henry, together with defeats in Wales and local crises, brought about the main crisis of his reign. The Provisions of Oxford (1258) created a 15-member privy council, selected by barons, to advise the king and oversee the entire administration. Parliament was to be held three times a year and the households of the king and queen were also to be reformed. The settlement began to break down in 1260 with quarrels between the Earl of Gloucester and the ambitious Simon de Montfort . Civil war was inevitable. In May 1264, Simon de Montfort won a resounding victory at Lewes and set up a new government. In May 1265, Henry's eldest son Prince Edward escaped captivity and rallied the royalist forces, defeating and killing de Montfort at Evesham before taking control of government from his weakened father.
PEASANTS REVOLT	In 1381, the Peasants' Revolt occurred. Richard II was only 14 years of age, and the war against France was going badly. The peasants of Essex, led by Jack Straw, and of Kent, led by Wat Tyler , revolted against the Poll Tax. A priest called John Ball believed that all men were equal and objected to the wealth and privileges of the lords. The rebels marched on London and entered the city, where they killed the Archbishop of Canterbury and destroyed the houses of the king's leading ministers. But they still obeyed the king, and went home when he asked. Then the king put the revolt down. Many of the rebels were executed.

CHALLENGING ROYAL AUTHORITY

HENRY VIII	In 1536, rebellions took place in northern England asking Henry VIII not to dissolve the monasteries (Pilgrimage of Grace). The rebels complained about 'low born' Thomas Cromwell, Henry's Chancellor, and stressed that they were the king's loyal subjects. The trouble began with a march in Lincolnshire, called the Lincolnshire Rising, on 1 October. The crowds dispersed when the king's army arrived. On 13 October 30,000 Yorkshire people rebelled. Led by Robert Aske, they went to York, and reopened the monasteries Henry had closed. At first Henry negotiated with the rebels. However, in 1537 he sent a huge army north. Henry ordered the arrest of the leaders and about 200 people were executed.
ENGLISH CIVIL WAR	Charles I came to the throne in 1625. Relations between Charles I and Parliament gradually got worse. There were clashes about foreign policy and many Puritan Protestants disliked Charles's religious policy and belief in Divine Right (that God chose the King, and he therefore had the right to make decisions alone as his representative on earth, without question). Charles revived old laws and taxes without the agreement of Parliament. When Parliament complained in 1629, he dismissed them. Until 1640, Charles ruled without a Parliament – the 'Eleven Years' Tyranny'. War with Scotland forced Charles to recall Parliament. Instead of granting Charles money, Parliament sent him the Grand Remonstrance (1641). This was a list of 204 complaints about the way he was running the country. After Charles had tried and failed to arrest the five leaders of the Parliament, a civil war broke out. Charles's forces were gradually worn down. After Oliver Cromwell set up the New Model Army , Charles surrendered in 1646. He failed a second time to defeat Parliament during the Second Civil War in 1648. Parliament put him on trial for treason and he was executed in 1649. After Charles's execution England became a republic called the Commonwealth (1649-60). At first Parliament ruled the country, but in 1653 Oliver Cromwell dismissed Parliament and ruled as Protector. The army became important. Under the Protectorate (1653-1660), England was governed by eleven Major-Generals – Cromwell's government was a military dictatorship. The Puritans became powerful. During the Protectorate, churches had to be plain, and dancing, the theatre, pubs, gambling, Maypoles and even Christmas were banned. Even poor people became political: The Levellers wanted to give ordinary men the vote. Cromwell crushed the movement. In 1660, Charles II was restored as Monarch.
AMERICAN REVOLUTION	British settlers built up a sense of independence and of being American rather than British. They started to resent having to pay tax to the king in England. In 1776, thirteen American colonies joined together to form the United States of America and declare themselves independent from Britain. They stopped paying taxes to Britain and no longer recognised Britain as being in charge. Britain sent troops to fight them in war. France, Spain and the Netherlands took sides with America and eventually Britain gave up at the Battle of Yorktown in 1781. America was no longer ruled by the King George III, and instead George Washington was chosen as its first president.

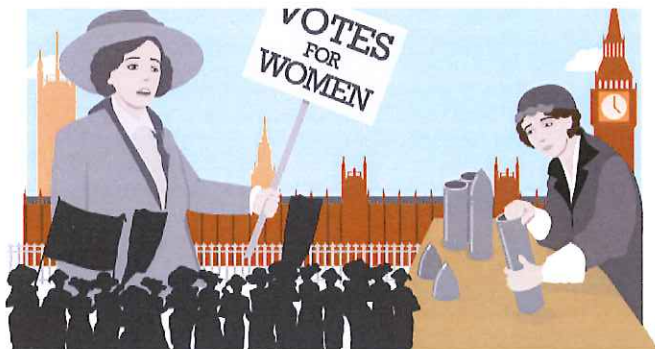
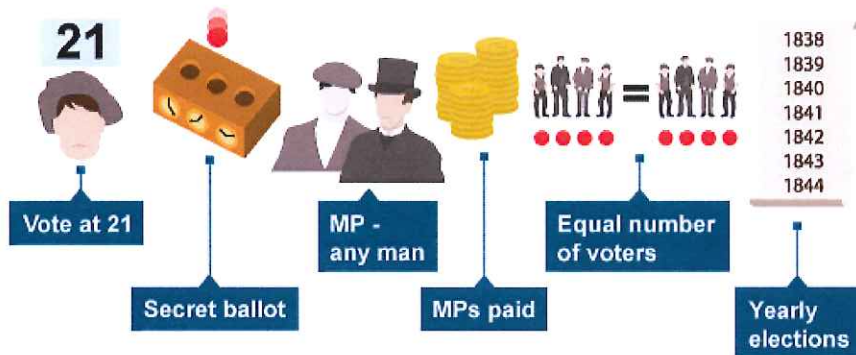
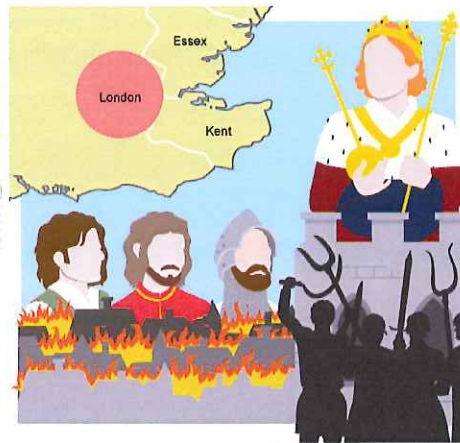
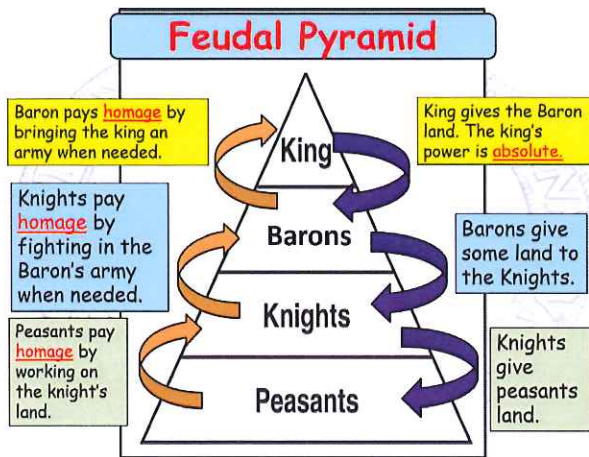
KEY TERMS, PEOPLE AND DEFINITIONS

REFORM AND REFORMERS

CHARTISM	Many working-class men had campaigned for the 1832 Reform Act . They felt betrayed when it did not give them the vote. In 1836, a cabinet-maker named William Lovett formed the London Working Men's Association, to campaign for working people. One of Lovett's ideas was The People's Charter (1838), demanding: a vote for all men twenty-one or older, the secret ballot, that any man can become an MP (no need to own property), payment of MPs, constituencies with equal numbers of voters parliamentary elections every year. Chartism arose when the Northern Star, a newspaper that campaigned for better wages and conditions for workers, started to support The People's Charter. The Charter was a demand for political reform and it was produced by a cabinet-maker called William Lovett in 1838. The 1830s and 1840s were a time of falling living and working standards for many working class people, and the Charter became the focus for their hopes and protests. It demanded equal rights for all men and a greater form of democracy.
ANTI-SLAVERY MOVEMENT	In 1787, the Committee for the Abolition of the Slave Trade was set up. William Wilberforce represented the committee in Parliament. The campaigners boycotted sugar, wrote letters and presented petitions. Thomas Clarkson went on a speaking tour, showing people chains and irons and a model of a slave ship. Other campaigners published leaflets describing conditions on the Middle Passage and atrocities such as the Zong incident (1781). The captain of the slave ship Zong threw 133 slaves overboard so he could claim the insurance. British Africans such as Olaudah Equiano formed the 'Sons of Africa' and campaigned against the slave trade.
ANTI-CORN LAW LEAGUE	The Anti-Corn Law League was a successful political movement in Great Britain aimed at the abolition of the unpopular Corn Laws, which protected landowners' interests by levying taxes on imported wheat, thus raising the price of bread at a time when factory-owners were trying to cut wages.
FACTORY REFORMERS	When concerns were raised about the working conditions in factories, especially for children, reformers began to propose changes to improve working environments. The first supporters of factory reform were caring mill owners, many of them in the Tory Party, who were motivated mainly by their religion. One such factory owner was Robert Owen. He owned a cotton mill in New Lanark in Scotland. He thought that if workers were treated well then they would work harder. This would then make greater profits for the factory owners. He provided good houses and a school for his workers and their families. He would not allow a child under ten to work in his mills. He set up the Grand National Consolidated Trades Union for his workers in 1834.
TOLPUDDLE MARTYRS	When Dorset farm-workers tried to organise a trade union, six of them were transported to Australia. A petition of 800,000 signatures was organised, and the men were freed in 1836.
MATCH GIRLS' STRIKE	The strike was caused by the poor working conditions in the match factory, including fourteen-hour work days, poor pay, excessive fines and the severe health complications of working with white phosphorus, such as phossy jaw, but was sparked by the dismissal of one of the workers on or about 2 July 1888.
DOCKERS STRIKE	The London Dock strike was an industrial dispute involving dock workers in the Port of London. It broke out on 14 August 1889, and resulted in a victory for the 100,000 strikers and established strong trade unions amongst London Dockers, one of which became the nationally important Dock, Wharf, Riverside and General Labourers' Union. The strike is widely considered a milestone in the development of the British labour movement, symbolising the growth of the New Unions of casual, unskilled and poorly paid workers

EQUALITY AND RIGHTS

CAMPAIGN FOR WOMENS' SUFFRAGE	The Suffragettes (1903) used direct action to get their way. They were led by Emmeline Pankhurst. They chained themselves to railings and interrupted meetings. When Parliament refused to give votes to women, their campaign became more violent as they burned down buildings and planted bombs. Emily Wilding Davison died when she threw herself under a horse. However, the Suffragists campaigned peacefully, and in 1928, all women were given the vote on the same terms as men. This may have also been because of the role women played during WW1.
GENERAL STRIKE 1926 / TRADE UNION REFORM LATE 20TH CENTURY	Trade Unions grew up in the late 19th century. In 1926 they were sufficiently powerful to mount a General Strike, which lasted ten days. After the Second World War, trade unionists used strikes to get better wages. Although their legal powers were reduced in the 1980s, trade unions still use negotiation, marches and strikes to try to get better wages and conditions for their members.
MINORITY RIGHTS / DISCRIMINATION	There was major immigration in the 20th century. After the war, many immigrants came to Britain from the former colonies of the British Empire. The first boat to come was the SS Windrush from Jamaica in 1948. In the 1960s, many Indians and Pakistanis came to work in the textile mills of Yorkshire and Lancashire. In 1968, Kenyan Asians came to Britain when they were expelled from Kenya. In 1972, Ugandan Asians came to Britain when they were expelled from Uganda. The number of non-white British people rose from 400,000 in 1961, to 4.6 million in 2001. In 1993 the European Union brought in the 'single market', which gave EU citizens the right to live and work anywhere in the EU. By 1997 a million people had come to Britain from the poorer countries of eastern Europe, especially Poland. Immigrant groups faced discrimination and violence, for example: 1958: Notting Hill riots: British youths attacked West Indian youths, 1968: Politician Enoch Powell gave a speech talking about a time when "the black man will have the whip hand", and predicting "rivers of blood". 1981: Race riots in London and Toxteth in Liverpool. Following riots in Brixton , London, the Scarman report was commissioned. According to this, the riots were a spontaneous outburst of built-up resentment sparked by particular incidents. Lord Scarman stated that "complex political, social and economic factors" created a "disposition towards violent protest". The Scarman report highlighted problems of racial disadvantage and inner city decline, warning that "urgent action" was needed to prevent racial disadvantage becoming an "endemic, ineradicable disease threatening the very survival of our society. During the 20th century, the British government passed a number of laws to try to reduce the inflow of immigrants: Between 1962 and 1981 a number of immigration acts made it gradually more difficult to come to live in Britain. The many different ethnic cultures have influenced British food, sport, dance, music and fashion. In 1965, 1986 and 1976 the government passed Race Relations Acts to prevent racial discrimination.



Year 11 Autumn Term Knowledge Organiser

British Thematic Study: Power and the People (a study over 800 years)

How have people challenged authority? How have British people gone from feudalism in the Middle Ages to the democratic, equal society we have today?

USEFUL WEBSITES:

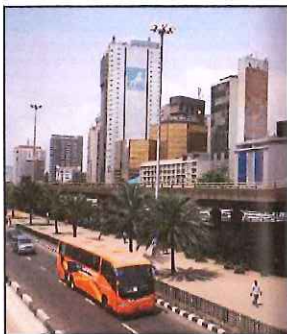
<http://www.bbc.co.uk/bitesize/ks3/history/uk-through-time/popular-protest-through-time/revision/8/>

<https://www.bl.uk/magna-carta/articles/magna-carta-an-introduction>

<http://www.historylearningsite.co.uk/the-role-of-british-women-in-the-twentieth-century/suffragettes/>

<http://www.bl.uk/learning/histcitizen/21cc/struggle/chartists1/introduction/historyofchartism.html>

How important is Nigeria regionally and globally?

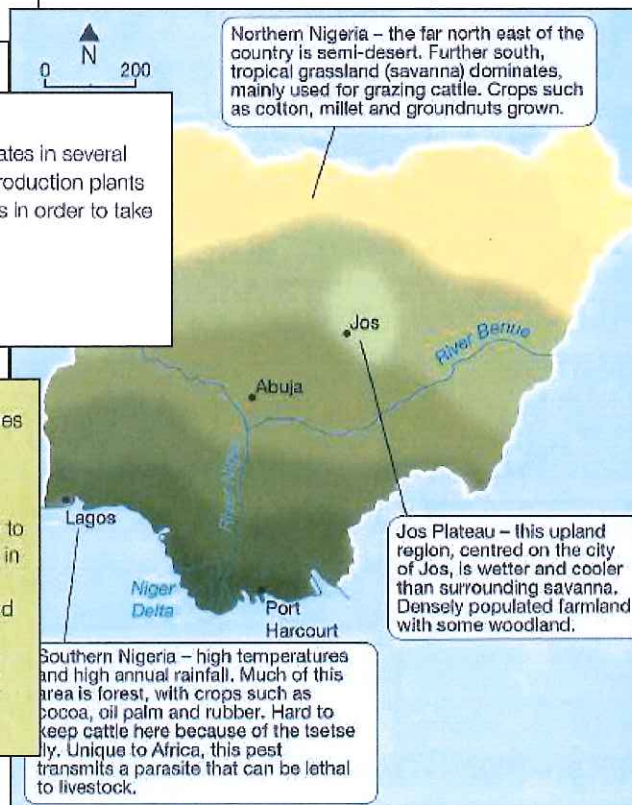


What is the global importance of Nigeria?

Nigeria is a Newly-Emerging Economy (NEE) (see page 194). This means that it is one of a number of countries experiencing a period of rapid economic development. In 2014, Nigeria became the world's 21st largest economy – by 2050 it should be in the top twenty. Nigeria is predicted to have the world's highest average GDP growth for 2010–15.

Nigeria supplies 2.7 per cent of the world's oil – the 12th largest producer. Much of the country's economic growth has been based on oil revenues. But it has also developed a very diverse economy which now includes financial services, telecommunications and the media. In common with cities around the world, the centre of Lagos is a thriving global economic hub (photo B).

Environmental and cultural aspects:



Changing industry and the role of TNCs:

What is a transnational corporation?

A **transnational corporation (TNC)** is a large company that operates in several countries. A TNC usually has its headquarters in one country with production plants in several others. Transnational companies locate in foreign countries in order to take advantage of:

- ♦ tax incentives
- ♦ laxer environmental laws
- ♦ cheaper labour
- ♦ access to a wider market.

Advantages

- Companies provide employment and the development of new skills
- More money is spent in the economy
- Investment by companies in local infrastructure and education
- Other local companies benefit from increased orders
- Valuable export revenues are earned

Disadvantages

- Local workers are sometimes poorly paid
- Working conditions are sometimes very poor
- Management jobs often go to foreign employees brought in by the TNC
- Much of the profit generated goes abroad
- Grants and subsidies used to attract TNCs could have been used to invest in Nigerian industry

Political and social aspects of Nigeria:

Political context

The political map of Africa was drawn by a small group of powerful European countries at the Berlin Conference in 1883. These countries literally carved up control of Africa between them. This explains why many country borders are straight lines. Europeans exploited Africa's resources, including its people, who were traded as slaves.

In the 1960s many African countries gained their independence. Nigeria became fully independent from the UK in 1960. However, bitter power struggles resulted in a series of dictatorships and a civil war between 1967 and 1970. Lack of political stability affected Nigeria's development and led to widespread corruption. It is only since 1999 that the country has had a stable government. Recent elections in 2011 and 2015 were seen as free and fair.

Social context

Nigeria is a multiethnic, multifait country. Ethnic groups in Nigeria include the Yoruba (21 per cent of the population), Hausa and the Fulani (29 per cent), and Igbo (18 per cent) as well as many smaller groups. Christianity, Islam, and traditional African religions are practised widely. This social diversity is one of Nigeria's great strengths, but has also been a source of conflict.

In 1967 the Igbo-dominated south-east tried to separate from Nigeria to become the Republic of Biafra. As a result, the country was torn by civil war until the Biafrans were defeated in 1970.

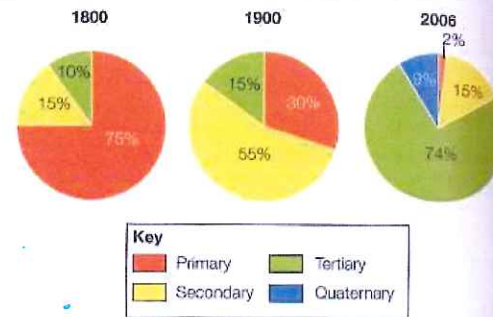
More recently, economic inequality between the north and south of Nigeria has created new religious and ethnic tensions, with the rise of the Islamic fundamentalist group Boko Haram. This has created an unstable situation in the country, and has had a negative impact on the economy, with a reduction in investment from abroad and a rise in unemployment.

Economic Change in the UK:

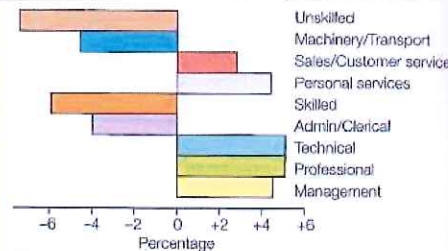
How has the economy of the UK changed?

Before 1800 most people in the UK worked in farming, mining or related activities – the *primary* sector. But the Industrial Revolution of the nineteenth century changed all that. Many people moved to towns and cities for work – making steel, ships or textiles (the *manufacturing* sector).

In the last few decades it all changed again, with a big shift to jobs in the service (or *tertiary*) sector – health care, offices, financial services and retailing (pie chart **A**). Most recently, the *quaternary* sector has developed, with jobs in research, information technology and the media (graph **B**).



A The UK's changing employment structure



B Changes in UK employment, 1984–2014

The North-South Divide:

Why is there a north-south divide in the UK?

During the Industrial Revolution the UK's growth was centred on the coalfields in Wales, northern England and Scotland. Heavy industries and engineering thrived in cities such as Manchester, Sheffield and Glasgow, generating wealth and prosperity.

Since the 1970s many industries (such as steel-making, ship building and heavy engineering) have declined and unemployment increased. Alternative sources of energy have reduced the importance of coalfields and modern industries have located elsewhere.

London and the South East developed rapidly due to a fast-growing service sector. London is a major global financial centre and has grown faster than the rest of the UK. This has led to high house prices across the South East.

Changing Rural Landscapes in the UK:

Social effects	Economic effects of a growing population
Commuters continue to use services in the places where they work, for example, Cambridge – this has a negative effect on the local rural economy.	A reduction in agricultural employment as farmers sell their land for housing development, although this may increase jobs in construction.
80% car ownership is leading to increased traffic on narrow country roads and reducing demand for public transport.	Lack of affordable housing.
Modern developments on the edges of villages and gentrification of abandoned farm buildings can lead to a breakdown in community spirit.	This area has some of the highest petrol prices in the country due to the high demand.
Young people cannot afford the high cost of houses and move away.	The increasing number of migrants from relatively poor parts of Europe can put pressure on services and increase overall costs.

A Post-Industrial Economy in the UK:

Research

The UK research sector – part of the quaternary sector – employs over 60 000 highly-qualified people and is estimated to contribute over £3 billion to the UK economy. Research is done in British universities, such as Cambridge, Manchester and Edinburgh. It is also done by private companies and government bodies (figure **C**). The research sector is likely to be one of the UK economy's main growth areas in the future.



The Environmental Impacts of Industry:

Quarrying in the UK

Quarrying can have harmful impacts on the environment. It can:

- destroy natural habitats
- pollute nearby water courses
- scar the landscape.

Today, there are very strict environmental controls on quarrying in the UK.

Sustainable development is at the heart of planning regulations and approval for mining and quarrying.



D Torr Quarry

Companies are expected to restore or improve a quarry after it has been used. Examples of restoration include:

- landfill
- agriculture
- habitat creation
- housing
- flood storage.

Whilst in operation, there are strict controls on blasting, removal of dust from roads, and landscaping. Recycling is encouraged to reduce waste.

Coastal Characteristics:

How do waves form?

Waves are formed by the wind blowing over the sea. Friction with the surface of the water causes ripples to form and these develop into waves. The distance the wind blows across the water is called the fetch. The longer the fetch, the more powerful the waves.

Waves can also be formed more dramatically when earthquakes or volcanic eruptions shake the seabed. These waves are called tsunamis. In March 2011 a wall of water up to 40m high crashed into the Japanese coast north of Tokyo destroying several coastal settlements and killing over 20 000 people (photo B).



What are the coastal management options?

There are three different management strategies for defending the coast.

Hard engineering – using artificial structures such as sea walls to control natural processes

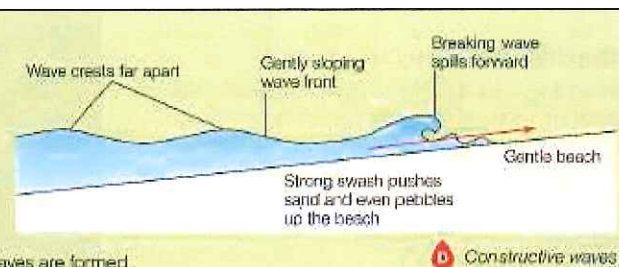
Soft engineering – less intrusive, more environmentally-friendly methods that work with natural processes to protect the coast

Managed retreat – this increasingly popular option enables the controlled retreat of the coastline, often involving allowing the sea to flood over low-lying land

Coastal Management:

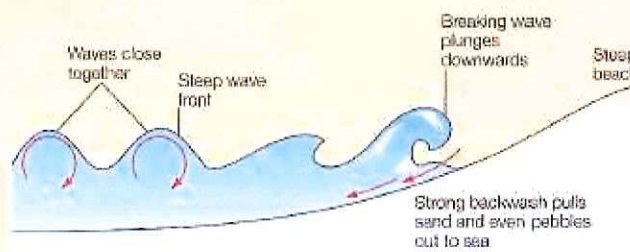
Constructive waves

These are low waves that surge up the beach and 'spill' with a powerful swash (diagram D). They carry and deposit large amounts of sand and pebbles and 'construct' the beach making it more extensive. Surfers prefer constructive waves because they give longer rides (photo A). These waves are formed by storms often hundreds of kilometres away.

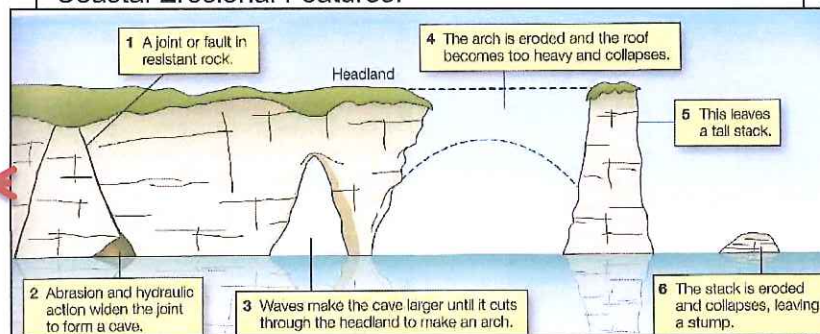


Destructive waves

These are formed by local storms close to the coast, and they can 'destroy' the beach – hence their name. They are closely spaced and often interfere with each other producing a chaotic swirling mass of water. They become high and steep before plunging down onto the beach (diagram E). There is little forward motion (swash) when a destructive wave breaks but a powerful backwash. This explains the removal of sand and pebbles and the gradual destruction of the beach.



Coastal Erosional Features:



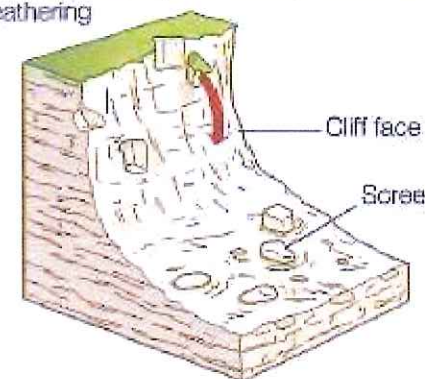
Headlands and bays

Different types of rock at the coastline will be eroded at different rates. Weaker bands of rock (such as clay) erode more easily to form **bays**. As the bays are sheltered, deposition takes place and a sandy beach forms (diagram A).

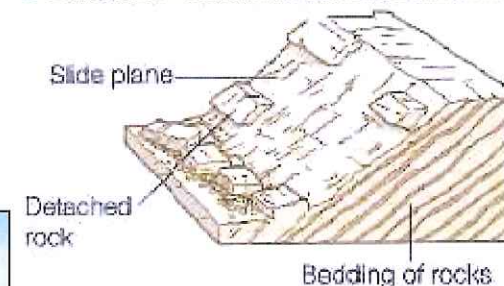
The tougher, more resistant bands of rock (such as limestone or sandstone) are eroded much more slowly. They stick out into the sea to form **headlands**. Erosion dominates in these high-energy environments, which explains why there are no beaches. Most *erosional* landforms are found at headlands.

Weathering and Mass Movement:

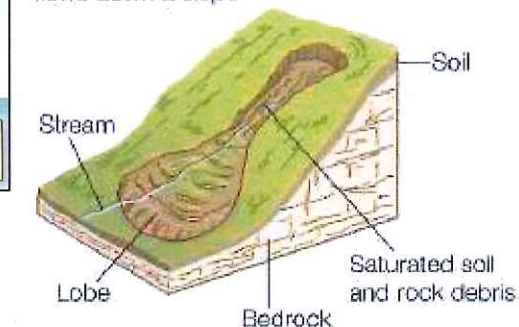
a Rockfall – fragments of rock break away from the cliff face, often due to freeze-thaw weathering



b Landslide – blocks of rock slide downhill



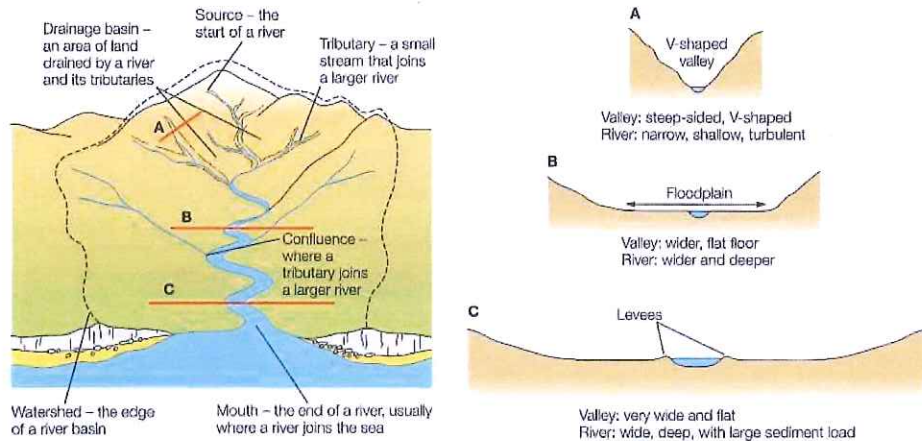
c Mudflow – saturated soil and weak rock flows down a slope



River Landscapes:

What is a drainage basin?

Diagram A shows a typical *drainage basin*, an area of land drained by a river and its tributaries. Make sure you are familiar with the key terms on this diagram, as you will need to remember them.



Managing Flooding:

What is hard engineering?

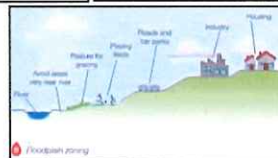
Hard engineering involves using man-made structures to prevent or control natural processes from taking place. This form of flood management is usually very expensive – individual projects can cost several million pounds. But this is the preferred option for protecting expensive property or land, such as housing estates, railways and water treatment works. The costs have to be weighed against the benefits.

- ♦ **Costs** – the financial cost of the scheme, and any negative impacts on the environment and on people's lives
- ♦ **Benefits** – financial savings made by preventing flooding, along with any environmental improvements

What is soft engineering?

Soft engineering involves working with natural river processes to manage the flood risk. Unlike hard engineering it does not involve building artificial structures or trying to stop natural processes. It aims to reduce and slow the movement of water into a river channel to help prevent flooding. In common with all forms of management there are costs (disadvantages) and benefits (advantages).

Planting trees to establish a woodland or forest is called *afforestation*. Trees obstruct the flow of water and slow down the transfer to river channels. Water is soaked up by the trees or evaporated from leaves and branches. Tree planting is relatively cheap and has environmental benefits.



River Processes and Erosional Landforms:

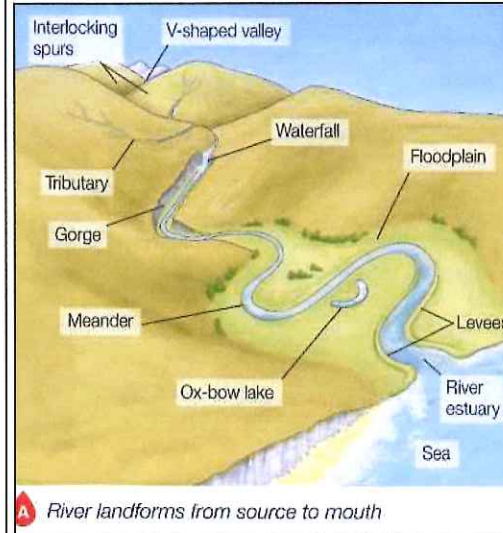
- ♦ **Hydraulic action** – the force of the water hitting the river bed and banks. This is most effective when the water is moving fast and when there is a lot of it.
- ♦ **Attrition** – when stones carried by the river knock against each other, gradually making the stones smaller and less rounded.
- ♦ **Abrasion** – when the load carried by the river repeatedly hits the bed or banks dislodging particles into the flow of the river.
- ♦ **Solution** – when the river flows over limestone or chalk, the rock is slowly dissolved. This is because it is soluble in mildly acidic river water.

What are the processes of transportation?

The material transported by a river is called its *load*. Diagram B shows the four main types of *transportation* that occur in a river:

- ♦ **traction**
- ♦ **saltation**
- ♦ **suspension**
- ♦ **solution.**

The size and total amount of load that can be carried will depend on the river's rate of flow – its *velocity*. After a rainstorm rivers often look very muddy because they are flowing fast and transporting a large amount of sediment (photo C). At low flow, when rivers are clear, very little sediment is being transported (photo A).



Depositional Landforms:

Ox-bow lakes

Over time, as meanders migrate across the valley floor, they may start to erode towards each other (diagram C). Gradually the neck of the meander narrows until it is completely broken through (usually during a flood) to form a new straighter channel. The old meander loop is cut off by deposition to form an ox-bow lake.

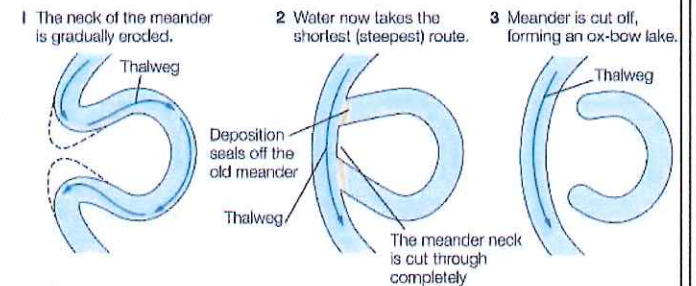


Diagram C: Stages in the formation of an ox-bow lake

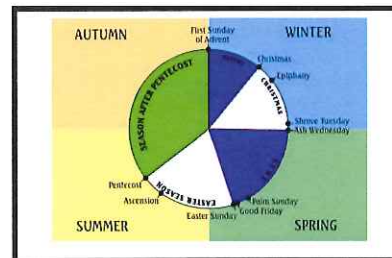
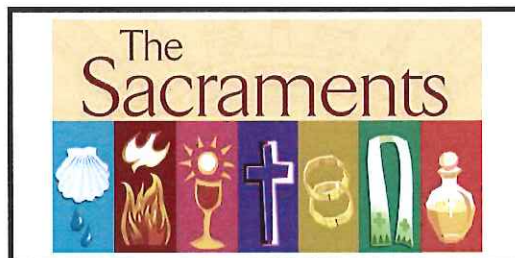
Year 11 AU1 & AU2 - Christianity: practises

KEYTERMS	
Worship	Acts of religious praise, honour or devotion
Liturgical worship	A church service that follows a set structure or ritual
Non-liturgical worship	Service that does not follow a set text or ritual
Informal worship	A type of non-liturgical worship, sometimes 'spontaneous' or 'charismatic' in nature
Private worship	When a believer praises or honours God on his or her own
Prayer	Communicating with God, either silently or through praise, thanksgiving or confession, or requests for God's help or guidance
Set prayers	Prayers that have been written down and said more than once by more than one person, for example the Lord's prayer
Informal prayers	Prayer that is made up by an individual using his or her own words
Nonconformist	An English protestant who does not conform to the doctrines or practices
The Lord's prayer	The prayer taught to the disciples by Jesus; also known as the 'Our Father'
Sacraments	Rites and rituals through which the believer receives a special gift of grace; for Catholics, Anglicans and many protestants, sacraments are 'outward signs' of 'inward grace'
Baptism	The ritual through which people become members of the Church; baptism involves the use of water as a symbol of the washing away of sin
Protestant	A branch of Christianity, originally Protestants were called by that name because they protested against some of the practises of the Catholic Church; there are many Protestant denominations, but they agree on the central belief that the Bible is the only authority for Christians
Believers' baptism	Initiation into the Church, by immersion in water, of people old enough to understand the ceremony/rite and willing to live a Christian life
Infant baptism	The ritual through which babies and young children become members of the Church, where promises are taken on their behalf by adults; the infant is freed from sin and introduced to the saving love of God and the support of the Christian community
Holy Communion	A service of thanksgiving in which the sacrificial death and resurrection of Jesus are celebrated using bread and wine; also called Eucharist, Mass, the Lord's Supper, the Breaking of Bread, and the Divine Liturgy
Eucharist	From a Greek word meaning 'thanksgiving'; a service of thanksgiving in which the sacrificial death and resurrection of Jesus are celebrated using bread and wine
Pilgrimage	A journey by a believer to a holy site for religious reasons; pilgrimage is itself an act of worship and devotion
Festival	A day or period of celebrations for religious reasons
Christmas	The day commemorating the incarnation, the birth of Jesus; also, the season of twelve days ending with the Epiphany (when Christians remember the visit of the wise men)
Easter	The religious season celebrating the resurrection of Jesus from the dead; it starts on Easter Day and finishes with the feast of Pentecost
Church	1. The holy people of God, also called the Body of Christ, among whom Christ is present and active 2. A building in which Christians worship
Agape	A word used in the Bible that describes selfless, sacrificial, unconditional love
Mission	The vocation or calling of a religious organisation or individual to go out into the world and spread the faith
The Great Commission	Instruction to his followers that they should spread his teachings to all the nations of the world

Missionary	A person sent on a religious mission, especially to promote Christianity in a foreign country through preaching or charitable work
Evangelism	Spreading the Christian gospel by public preaching or personal witness
Reconciliation	A sacrament in the Catholic Church; also, the restoring of harmony after relationships have broken down
Persecution	Hostility and ill-treatment, especially because of race, or political or religious beliefs

The learning journey

- Worship is how Christians show love and respect for God, this may be done in many different ways: formally, informally or in private.
- Prayer is communicating with God, they may be set prayers or informal. The Lord's prayer is a prayer Jesus taught his followers and continues to be important to Christians today.
- Baptism is the initiation rite by which people become members of the Christian Church. This may happen when a baby is born or when the person is old enough to make the decision to become a Christian and understand the implications.
- Holy Communion is a sacrament to celebrate the sacrifice of Jesus on the cross. Different churches celebrate this in different ways. Traditionally bread and wine is consumed to remember Last Supper and the sacrifice Jesus made for Christians.
- Christians may visit a place of religious significance; it is an act of worship and shows devotion to God. Iona and Lourdes are 2 places Christians may visit.
- Festivals are important in Christianity especially Christmas and Easter. They help to remember key events in the life of Jesus.
- The Church plays an important role in the community by running foodbanks and having Street Pastors. The Church believes that they have an important role to play in helping those that need help because of the parable of sheep and goats and other teachings of Jesus.
- Christians believe they have a duty to spread the good news to non-believers that Jesus is the Son of God and came into the world to be its saviour.
- Christians believe that Jesus rose from the dead 3 days after his crucifixion (resurrection) and then ascended back up to heaven 40 days later. You will explore these beliefs further and understand the implication of them on Christians.



Yr 11 Spanish Au1 - Current and future study and employment.



THIS TERM YOU WILL BE;

Giving opinions about school subjects
Describing school facilities
Talking about subjects and teachers
Describing your school
Describing school uniform and school day
Talking about your school day and daily routine
Talking about future plans

Key grammar:

Using opinion verbs
Adjective agreement
Revising comparatives and superlatives
Justifying opinions
Using negatives
Comparing then and now
Using quantifiers and intensifiers
Using phrases followed by the infinitive
Revising se debe, hay que, tener que.
Using object pronouns
Using the near future tense
Asking questions
Uses of Tu and usted
Revising the perfect tense

Key vocabulary I will learn:

SCHOOL SUBJECTS AND OPINIONS

¿Qué asignaturas (no)
te gustan?

Mi profesor(a) / profe...

enseña bien

explica bien

tiene buen sentido del
humor

tiene expectativas muy
altas

me hace pensar

crea un buen ambiente
de trabajo

nos da consejos / es-
trategias

nos pone muchos
deberes

nunca se enfada

SCHOOL SUBJECTS AND OPINIONS

What subjects do you (not)
like?

My teacher / teacher

teaches well

Explains well

It has good sense of
humor

Has very high
expectations

it makes me think

Creates a good working
environment

Give us tips
/ strategies

He gives us a lot of home-
work

Never gets angry

WHAT MY NEW SCHOOL IS LIKE

(En) Mi escuela primaria / Mi
insti...

(no) había / hay

(no) tenía / tiene

(una) piscina

(un) polideportivo

pizarras (interactivas)

aulas de informática

exámenes / deberes

uniforme

espacios verdes

más tiempo libre

más alumnos / profesores

más oportunidades para

hacer...

El edificio

Las instalaciones

El día escolar

Las asignaturas

WHAT MY NEW SCHOOL IS LIKE

(In) My primary school / My
school

There wasn't / isn't

I did not have

a pool

A sports centre

interactive boards

Computer classes

Exams / homework

uniform

green areas

more free time

More students / teachers

More opportunities

to do ...

Building

The installations

The school day

The subjects

SCHOOL RULES

¿Cuáles son las normas de tu insti?
 Está prohibido
 (No) Se permite
 (No) Se debe
 Hay que
 Tenemos que
 mantener limpio el patio
 comer chicle
 correr en los pasillos
 ser puntual
 usar el móvil en clase
 dañar las instalaciones
 ser agresivo o grosero
 llevar piercings en el insti

SCHOOL RULES

What are the rules of your institution?
 Is prohibited
 (Not) allowed
 You must (not)
 You must
 We have to
 Keep the yard clean
 chew gum
 Run in the halls
 to be on time
 Use a mobile in class
 Damage facilities
 Being aggressive or rude
 Wear piercings in school

SCHOOL EXCHANGE

Voy / vas
 / vamos / vais a
 llegar...
 salir...
 practicar...
 ir a...
 pasar todo el día en...
 hacer una visita guiada de...
 ver los edificios...
 ir (juntos/as) a...
 comer...
 ir de excursión el día

SCHOOL EXCHANGE

I'm going / you are going /
 we are going
 to arrive...
 to get out...
 to practice...
 go to...
 Spend all day in ...
 Take a guided tour of ...
 See the buildings ...
 Go (together) to ...
 eat...
 To go hiking the whole day

DISCUSSING FUTURE PLANS

Quiero...
 Voy a...
 Espero...
 Pienso...
 Me gustaría...
 Tengo la intención de...
 seguir estudiando
 encontrar trabajo
 vivir en el extranjero
 trabajar como voluntario/a en...
 tener una familia
 tomarme un año sabático
 ir a la universidad
 Si apruebo mis exámenes,...
 Si trabajo mucho,...
 Si estudio (ciencias),...
 Si practico más deporte,...
 Si tengo éxito,...
 Si (no) voy al (instituto),...

DISCUSSING FUTURE PLANS

I want...
 I will...
 I hope...
 I think...
 I would like...
 I have the intention of...
 Keep studying
 to find a job
 Living abroad
 Work as a volunteer in ...
 have a family
 Take me a sabbatical
 going to college
 If I pass my exams, ...
 If I work a lot
 If I study (science), ...
 If I practice more sport, ...
 If I succeed, ...
 If I do not go to the institute

ACHIEVEMENTS

Para mí...
 En mi opinión...
 Creo que...
 las actividades extraescolares...
 son...
 algo diferente
 muy divertidas
 un éxito
 te ayudan a...
 olvidar las presiones del colegio
 desarrollar tus talentos
 hacer nuevos amigos
 te dan...
 una sensación de logro
 más confianza
 la oportunidad de ser creativo/a
 la oportunidad de expresarte

ACHIEVEMENTS

For me...
 In my opinion...
 I believe that...
 Extracurricular activities ...
 They are...
 something different
 Very funny
 a success
 They help you to ...
 Forget the pressures of school
 Develop your talents
 making new friends
 they give you...
 A sense of accomplishment
 more confidence
 The opportunity to be creative
 The opportunity to express yourself

stretch and challenge

Using 3 time frames accurately to describe what you did, what you are going to do and what you normally do.
 Using si to express future plans
 Using the subjunctive

Yr 11 Spanish Au2 - Local, national, international and global areas of interest.

Key vocabulary I will learn:

KEY TOPICS I WILL LEARN:

Talking about your home
Talking about different types of houses
Talking about your neighbourhood
Talking about how you would change your city
Shopping for clothing
Giving presents and making complaints
Dealing with problems

DESCRIBING MY HOUSE

Vivo en...
un piso/apartamento/
chalé
una casa
abajo
arriba
fuera
Hay/Tenemos...
un aseo
un comedor
un cuarto
un cuarto de baño
un dormitorio
un estudio/despacho
un garaje
un jardín
un salón
una habitación
una cocina
una terraza
delante de
detrás de
encima de
debajo de
al lado de
a la derecha de
a la izquierda de
entre
En la primera planta/la
planta baja hay...
En las paredes/el suelo
hay...
Es la habitación donde
me lavo el pelo,...

DESCRIBING MY HOUSE

I live in...
A flat / apartment /
chalet
a house
down
above
outside
There / We have ...
a clean up
a dining room
room
a bathroom
a bedroom
A study / office
a garage
a garden
a room
a room
a kitchen
a porch
in front of
in back of
above
under
next to
to the right of
to the left of
between
On the first floor / ground
floor there is ...
On the walls / floor there
are ...
It's the room where I wash my
hair, ...

DESCRIBING NEIGHBOUR- HOOD

Vivo en un pueblo/una ciu-
dad...
histórico/a
moderno/a
pequeño/a
turístico/a
grande
importante
industrial
Mi barrio/pueblo/ciudad es...
bonito/a
conocido/a
feo/a
ruidoso/a
tranquilo/a
(No) Está...
aislado/a
limpio/a
sucio/a
(No) Hay tanto/a/os/as...
Ahora vivo en...
Es...
Está...
(No) Hay...
Lo bueno/malo es que...
Juego/voy/tengo...
En el pasado vivía en...
Mi abuelo dice que antes
era...
Estaba...
(No) Había...
Lo bueno/malo era que
Jugaba/iba/tenía...

DESCRIBING NEIGHBOUR- HOOD

I live in a town / city ...
Historical
Modern
Small
Tourist
big
important
industrial
My neighborhood / town /
town is ...
Beautiful
Known
Ugly
Noisy
Quiet
It isn't
Isolated
Clean
Dirty
(No) There is so much ...
Now I live in...
Is...
This...
(There is no...
The good / bad thing is ...
I play / I go / I have ...
In the past I lived in ...
My grandfather says he used
to be ...
I was...
(There was not...
The good / bad thing was
that

Key grammar:

Using prepositions
Using a variety of time frames to express opinions
Using the imperfect and perfect tenses
Using the conditional tense
Using direct object pronouns
Using *este, ese* and *aquel*
Using indirect object pronouns

**WHAT YOU WOULD
CHANGE IN THE CITY**

En mi ciudad...
hay...
muchos turistas
mucho tráfico
mucha basura
muchos habitantes
muchas tiendas
una zona peatonal
muchos museos y muchas
galerías de arte

no hay...
muchos árboles
hay muchos espacios
verdes
hay red de transporte
público
hay muchas áreas de ocio
sería,
tendría,
habría,
estaría,
podría,
deberían
construir,
mejoraría...

**WHAT YOU WOULD CHANGE
IN THE CITY**

In my city...
there are...
A lot of tourists
much traffic
lots of trash
many inhabitants
many stores
A pedestrian zone
Many museums and many art
galleries

there is no...
many trees
There are many
green spaces
There is public transport
network
There are many leisure areas
it would be
it would have
there would be
it would be (location)
it could be
they should build
to build
I would improve

**DESCRIBING THE FURNITURE
IN MY HOUSE**

el armario
el equipo de música
el espejo
el horno
el lavaplatos
el ordenador
el sofá
la alfombra
la butaca/el sillón
la cama
la estantería
la lámpara
la lavadora
la moqueta
la nevera/el frigorífico
la puerta
la silla
la televisión
la ventana

**DESCRIBING THE FURNITURE
IN MY HOUSE**

cabinet
The stereo
mirror
the oven
the dishwasher
the computer
the couch
the carpet
The chair
bed
the shelf
the lamp
the washing-machine
The carpet
The fridge / fridge
the door
the chair
television
the window

stretch and challenge

Using complex sentences including present subjunctive

Using the imperfect and present in the same sentence

GCSE Computer Science | **Hardware** | Required knowledge

Hardware

- Definition.
- Components
 - Input
 - Process
 - Storage
 - Output
- Computer architecture
 - Von Neumann

Central processing unit (CPU)

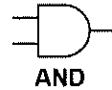
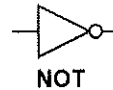
- Arithmetic & logic unit
- Control unit.
- Fetch-execute cycle
 - Fetch
 - De-code
 - Execute
- The boot sequence
- Clock speed
 - Processor speeds (MHz, GHz)
- Cache memory
- Multiple processor cores
 - Advantages / disadvantages.

Memory

- Random Access Memory (RAM)
 - Volatile
- Read Only Memory (ROM)
 - Non-volatile
- Virtual memory
- Flash memory

Binary logic

- Why do computers use binary values?
- Logic gates



- Truth tables

A	B	Out
0	0	0
0	1	1
1	0	1
1	1	0

Input devices

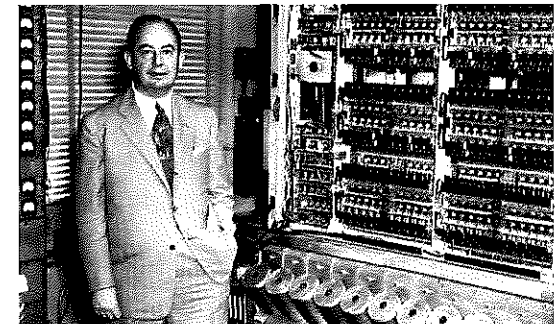
- Keyboard
- Mouse
- Touch screen
- Microphone
- Camera
- Sensor
- Bar code scanner
- Eye-typer
- Foot mouse
- Puff-suck switch
- Braille keyboard

Output devices

- Monitor
- Printer
- Plotter
- Speakers
- Actuators

Secondary storage

- Magnetic hard disk
- Optical disk
- Flash memory
- Considerations for selecting storage:
 - Capacity
 - Speed
 - Portability
 - Durability
 - Reliability



John Von Neumann

It is your responsibility to make sure you regularly revisit this knowledge outside of class.

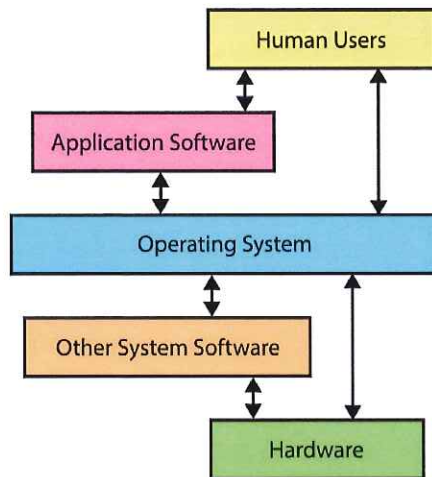
GCSE Computer Science | **Software** | Required knowledge

Software

- System
- Application
- Utility

System software

- **Software that controls the hardware.**
 - Operating system



User interface software

- Allow user to control and interact with a computer.
- **Command line interface**
- **Graphical user interface (GUI)**
- **Touch screens**
- **Natural language and speech**
 - E.g. Siri

Memory management software

- Virtual memory
- Peripheral memory
- Fragmentation & defragmentation
- Device drivers
- Multitasking

File and directories

- **File systems.**
 - Files stored in directories
 - Directories can include sub-directories
- **File extensions.**
 - Part of file name that indicate the type of file:
 - .doc
 - .pdf
 - .html
 - .mp3
 - .jpg
- **Attributes**
 - Provide extra information about files:
 - Who created the file
 - View or edit it
 - Read-only
 - Size of file
 - Date of last access
 - Date last changed

Security

- Viruses
- Authentication
- Privileges
- Encryption

Programming software

- Editors
- Interpreters
 - Compilers
 - Translators

Application and utilities

- Applications
 - Word processors
 - Hotel booking system
- Utilities
 - Antivirus
 - System clean up
 - Defragmentation





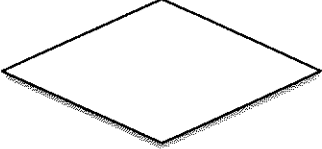

Software procurement

- Custom written software
- Off the shelf software
- Open source software
- Proprietary software

It is your responsibility to make sure you regularly revisit this knowledge outside of class.

Programming and Development

Flow charts like Pseudocode are informal but the most common flow chart shapes :

	Line	An arrow represents control passing between the connected shapes
	Process	This shape represents something being performed or done.
	Sub Routine	This shape represents a subroutine call that will related to a separate, non-linked flow chart
	Input/Output	This shape represents the input or output of something into or out of the flow chart
	Decision	This shape represents a decision (Yes/No or True/False) that results in two lines representing the different possible outcomes
	Terminal	This shape represents the 'Start' and 'End' of the process

Data types

- **Integer** e.g. 23
- **Float** e.g. 23.7
- **Character** e.g. A or 5
- **String** e.g. A546TH
- **Boolean** e.g. TRUE or FALSE.

Comments

- # used to start a comment
- Always in red
- Used to help users understand the program

Comparison operators

Comparison operator	Meaning
==	Is equal to
>	Is greater than
<	Is less than
!=	Is not equal to
>=	Greater than or equal to
<=	Less than or equal to

- Operator priority: **BIDMAS**

Arithmetic operators

+	Addition e.g. $x = 6 + 5$ gives 11
-	Subtraction e.g. $x = 6 - 5$ gives 1
*	Multiplication e.g. $x = 12 * 2$ gives 24
/	Division e.g. $x = 12/2$ gives 6
MOD	Modulus e.g. $12 \text{MOD} 5$ gives 2
DIV	Quotient e.g. $17 \text{DIV} 5$ gives 3
^	Exponentiation e.g. $3 ^ 4$ gives 81

Variables and constants

Variables and constants are assigned using the = operator

X = 3
Name = "Bob"

Variables and constants are declared the first time a value is assigned. They assume the data type of the value they are given.

Variables in the main program can be made global with the keyword global

Global userid = 123

Variables in the main program can be made constant with the keyword const

Const vat = 20

Sequencing – arranging instructions for algorithms and programs in a particular order

Repetition – repeating the execution of certain instructions (creating loops)

Selection – is when a computer executes instructions if a particular condition is met or not

Sequencing – arranging instructions for algorithms and programs in a particular order

Algorithms – a precise sequence of instructions, or set of rules, for performing a task

Decomposition - - breaking a problem or system down into parts

Patterns – spotting and using similarities

Errors

- Syntax
 - With how you write the code e.g. missing a bracket or a speech mark or using the wrong case
- Logical
 - Not obvious as the program will still run
 - But when run it will give the wrong answers/will not run as expected
 - Occur when your program is telling the computer to do something in the wrong order

Programming languages.

- **Low level languages:**
 - Machine language
 - Op-code
 - Operand
 - Assembly language
 - Mnemonics
- **High level languages:**
 - Source code
 - Assembler
 - Compiler
 - Interpreter

Control flow

- Sequence
- Selection
 - IF... ELSE...
- Iteration
 - For
 - While

GCSE Computer Science | Data representation | Required knowledge

Numbers

- Binary – base 2.
- Denary – base 10.
- Converting from binary to denary.
- Converting from denary to binary.
- Adding binary numbers.
 - Overflow error
- Units.
 - Nibble
 - Byte
 - Kilobyte
 - Megabyte
 - Gigabyte
 - Terabyte

Hexadecimal (hex) numbers

- Hex – base 16
- Converting between hex and denary.
- Converting between hex and binary.

Characters

- Character set.
 - Definition
 - ASCII
 - Unicode

Images

- Stored in binary on a computer.
- Metadata
- Pixel
- Colour depth
- Resolution
- Bitmap images
- Vector images

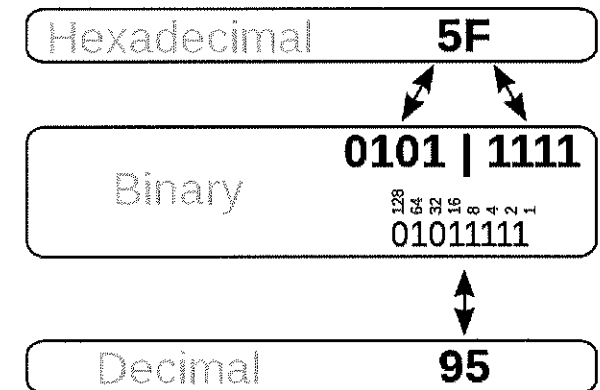
Sound

- Metadata
- Sample rate
 - Quality of sound
 - File size
- Sample interval
- Bit rate

Instructions

- Fetch-Execute cycle
- Op-code
- Operand
- Accumulator

Binary	Hex	Decimal
0000	0	0
0001	1	1
0010	2	2
0011	3	3
0100	4	4
0101	5	5
0110	6	6
0111	7	7
1000	8	8
1001	9	9
1010	A	10
1011	B	11
1100	C	12
1101	D	13
1110	E	14
1111	F	15



It is your responsibility to make sure you regularly revisit this knowledge outside of class.

GCSE Computer Science | **Computer systems** | Required knowledge

Computer systems.

- Inputs
- Processes
- Outputs
- Importance of computer systems.
- Examples of computer systems.

Types of computer systems.

Advantages / disadvantages of each.

- General-purpose systems
- Dedicated systems
- Control systems
- Embedded systems
- Expert systems
- Management information systems

Reliability of computer systems.

- The need for reliable systems.
 - Examples.
- Data integrity.
- Reliability and testing.

Standards of computer systems.

- Importance of standards.

Definition & examples of the following:

- De facto standards.
- De jure standards.
- Proprietary standards.
- Industry standards.
- Open standards.

Ethical & legal issues.

- Definition of ethical
- Definition of legal.
- Issues:
 - Privacy
 - Data security
 - Fair charging of services
 - Copyright
 - Access to data
- Data protection Act.

Environmental issues.

- **Waste** – obsolete computers need to be disposed of.
- **Energy** – computers use lots of energy.
 - Methods for reducing energy consumption.

It is your responsibility to make sure you regularly revisit this knowledge outside of class.

GCSE Computer Science | **Networks** | Required knowledge

Networks

- Collection of connected computers.
 - LAN
 - WAN

Network hardware

- Network interface card (NIC).
- Cables
 - Unshielded twisted pair (UTP)
 - Fibre-optic
- Hub
- Switch
- Wireless access point
- Router

Types of network

- Client-server network.
- Peer-to-peer network.

Network topologies

Diagram, advantages and disadvantages of the following:

- Bus
- Ring
- Star

Network technicalities.

- Protocols
 - TCP/IP
 - Data packets
 - Domain Name System (DNS)
 - File Transfer Protocol (FTP)
 - Hypertext Transfer Protocol (HTTP)
- Packet switching
- IP addressing
- MAC addressing

Network security

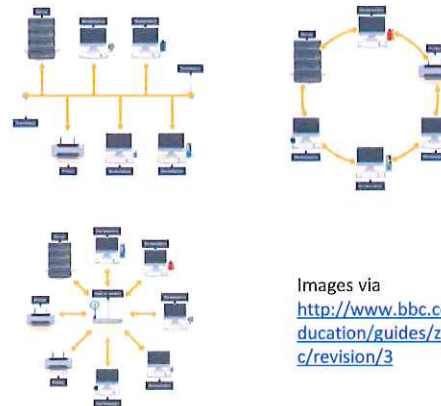
- Backups
- Archives
- Failover
- Disaster recovery
- Authentication
- Acceptable use policies

The internet.

- The internet vs. World Wide Web
- Hardware
 - Modem
 - Router
- Addressing
 - Uniform Resource Locator (URL)
 - IP address
 - Domain name System (DNS)
- Hypertext markup language (HTML).
 - Cascading style sheets (CSS)

Internet file standards.

- Meaning and uses for each of the following:
 - JPG
 - GIF
 - PDF
 - MP3
 - MPEG
- Compression
 - Lossy
 - Lossless.



Images via
<http://www.bbc.co.uk/education/guides/zh4why/c/revision/3>

It is your responsibility to make sure you regularly revisit this knowledge outside of class.

Year 11 BTEC First Award in Sport – Unit 5 Training for Personal Fitness – Learning Aim A

<p>Aims – what you would like to achieve by the end of the training programme.</p> <p>Objectives – how you plan to achieve your aims.</p> <p>Attitude – how positive or negative you generally feel about something.</p> <p>Intention – planning to do something.</p> <p>Principles of Training – factors that you must take into account to ensure that your training will be successful.</p> <p>Isometric – muscular action in which tension develops but there is no change in muscle length and no joint movement.</p> <p>Repetitions – the number of times you perform a single exercise such as a biceps curl; often abbreviated to 'reps'.</p>	<p>1-RM – the maximum amount of weight that you can lift in a single repetition. This is a measure often used to decide on the intensity of strength training programmes.</p> <p>Sets – a group of repetitions; for example, an experienced strength trainer may complete three sets of six reps.</p> <p>Exercise Adherence – how well you stick to your exercise programme.</p> <p>Strengths – areas of the training programme where personal aims and objectives have been achieved.</p> <p>Areas for Improvement – areas where training outcomes did not meet planned goals; for example, you planned to improve muscular strength but did not improve over the six weeks specified.</p>
---	---

Intensity is how hard training will be!

There are a number of ways you can manipulate the intensity when training, have a read through these below:

- Target zones and training thresholds - calculating and applying maximum heart rate (HR max = 220 – age (years) to training
 - 60-85% HR max is the recommended training zone for cardiovascular health and fitness
- The Borg (1970) (6-20) Rating of Perceived Exertion (RPE) Scale can be used as a measure of exercise intensity – please see the diagram opposite...
- The relationship between RPE and heart rate is;

$$RPE \times 10 = HR (bpm)$$

Rating of Perceived Exertion (RPE)

6	No exertion at all
7	
8	Extremely light
9	Very light
10	
11	Light
12	
13	Somewhat hard
14	
15	Hard (heavy)
16	
17	Very hard
18	
19	Extremely hard
20	Maximal exertion

Year 11 BTEC First Award in Sport – Unit 5 Training for Personal Fitness – Learning Aim B

Personal information to aid training programme design:

- personal goals: specific, measurable, achievable, realistic, time-related, exciting, recorded (SMARTER)
 - o short-term (set over a short period of time, between one day and one month)
 - o medium-term (should give progressive support towards achievement of long-term goals)
 - o long-term (what they want to achieve in the long term, and the best way of doing this).
- aims (details of what they would like to achieve)
- objectives (how they intend to meet their aims)
- lifestyle and physical activity history
- § medical history questionnaire
- § attitudes and personal motivation for training.

The basic principles of training (FITT):

- frequency (the number of training sessions completed per week)
- intensity (how hard training will be)
- time (how long training sessions will be)
- type (selecting a training method to improve a specific component of personal fitness and/or sports performance).

Further principles of training and how they are applied to training methods:

- § intensity:
 - o target zones and training thresholds (calculating and applying maximum heart rate (HR max) to training):
 - o $HR\ max = 220 - \text{age (years)}$
 - o 60–85% HR max is the recommended training zone for cardiovascular health and fitness
 - o the Borg (1970) (6–20) Rating of Perceived Exertion (RPE) Scale can be used as a measure of exercise intensity
 - o the relationship between RPE and heart rate where:
 - o $RPE \times 10 = HR\ (bpm)$.
- § progressive overload: in order to progress, the training needs to be demanding enough to cause the body to adapt, improving performance. This can be done by increasing frequency, intensity, or time, or by reducing recovery times. Not all these methods should be used at once or the increase in workload will be too much.
- § specificity: training should be specific to personal sport, activity or physical/skill related fitness goals to be developed
- § individual differences/needs (the programme should be designed to meet personal training goals and needs)

§ variation: vary the personal training regime to avoid boredom and maintain enjoyment

- § rest and recovery are required so that the body can recover from the training and to allow adaptation to occur
- § adaptation: where the body reacts to training loads by increasing its ability to cope with those loads. Adaptation occurs during the recovery period after the training session is completed
- § reversibility: if training stops, or the intensity of training is not sufficient to cause adaptation, training effects are reversed.

<p>Factors:</p> <p>Overcoming barriers, for example access to facilities, time, commitment, lack of interest, personal injury, emotional, motivation and cost.</p> <p>Strategies:</p> <p>For example, setting SMARTER targets (specific, measurable, achievable, realistic, time-related, exciting, recorded), implementing enjoyable activities, knowing the benefits of the personal training programme, support and reinforcement, and rewards for achieving goals.</p>	<p>Programme design:</p> <ul style="list-style-type: none"> ● use personal information to aid training programme design ● selection of appropriate training method(s)/activities for improving/maintaining fitness, e.g. flexibility, strength, muscular endurance and power, aerobic endurance, speed ● safe design: appropriate method(s)/selection of an appropriate combination of activities to meet personal training needs, goals, aims and objectives ● selection of appropriate activities for warm-up (light, continuous physical activity to prepare the body for exercise) ● selection of appropriate activities for cool down (light, continuous physical activity to reduce heart rate, remove lactic acid and prevent blood pooling) ● § creative design: consideration given to prevent/avoid barriers to training occurring, ensuring exercise adherence is maintained and the programme is enjoyable, for example, including interesting, different exercise activities to maintain motivation and commitment, and to prevent boredom.
--	---