

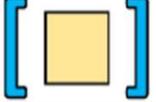
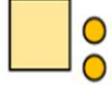
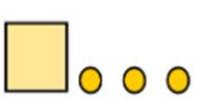
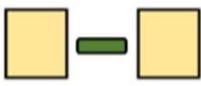
Contents

Page	Subject
2	Literacy
6	English
10	Maths
13	Science
19	History
23	Geography
27	Religious Education
31	French
35	Art
38	Computer Science
40	Construction
45	Food and Nutrition
47	Music
51	PE

Literacy Knowledge Organiser

Word classes	
Proper noun	Capital letter noun (person, place etc)
Abstract noun	Something abstract, cannot be touched (anticipation, love, etc)
Concrete noun	Something you can touch (like table, cloud, sheep, etc)
Collective noun	a count noun that denotes a group of individuals (e.g. assembly, family, crew)
verb	Doing word (beckoned, shouted, etc)
Adverb	a word or phrase that modifies the meaning of an adjective, verb, or other adverb, expressing manner, place, time, or degree (e.g. gently, here, now, very)
Pronoun	defined as a word or phrase that may be substituted for a noun or noun phrase. (I, he, they)
Preposition	Describes position of an noun (on, over, near, to, etc)
Adjective	Describing word (fluffy, cold, blue, etc)
Conjunction	a word used to connect clauses or sentences or to coordinate words in the same clause (e.g. and, but, if)

PUNCTUATION MARKS

	Full Stop or Period		Round Brackets
	Comma		Square Brackets
	Semi-colon		Quotation Marks
	Colon		Ellipsis Marks
	Question Mark		Slash
	Exclamation Mark		Underscore
	Apostrophe		Hyphen
	Underline		Dash

English Study Page

English Study Page

Sentences

Key terminology	Definition
Main clause	A group of words which contains a verb and makes sense on its own.
Subordinate/ dependent clause	A clause which does not make sense on its own (it is reliant on the main clause).
Co-ordinating conjunction	Link words or phrases that join two equal clauses.
Subordinating conjunction	Link words or phrases that join clauses where one is dependent on the other.

Sentence Types	Definition
Simple	A sentence containing one main clause.
Complex	A sentence containing a main clause and at least one subordinate/dependent clause.
Compound	A sentence containing two main clauses joined by a conjunction.
Complex compound	A sentence containing two main clauses and one or more subordinate or dependent clauses.
Minor	A word, phrase or a clause which is an incomplete sentence but functions as a sentence.

100 most commonly misspelled words

acceptable
 accidentally
 accommodate
 acquire
 acquit
 a lot
 amateur
 apparent
 argument
 because
 believe
 calendar
 category
 cemetery
 changeable
 collectible
 committed
 conscience
 conscientious
 conscious
 definite(ly)
 disappear
 disappoint
 drunkenness
 embarrass

equipment
 exhilarate
 exceed
 existence
 experience
 February
 foreign
 fourth
 gauge
 generally
 grammar
 grateful
 guarantee
 harass
 height
 hierarchy
 ignorance
 immediate
 independent
 indispensable
 intelligence
 its / it's
 judgement
 knowledge
 leisure

library
 lightning
 maintenance
 manoeuvre
 memento
 millennium
 miniature
 mischievous
 noticeable
 occasion
 occasionally
 occur / occurred
 occurrence
 official
 parallel
 parliament
 pastime
 pigeon
 possession
 preferable
 principal / principle
 privilege
 questionnaire
 receive
 recommend

referred
 reference
 relevant
 religious
 restaurant
 ridiculous
 rhythm
 sandal
 schedule
 scissors
 sensible
 separate
 special
 success
 to / too / two
 tomorrow
 their / they're / there
 twelfth
 tyranny
 until
 vacuum
 vicious
 weather
 weird
 you're / your

Building cohesion within and across a paragraph

Transitional phrases and fronted adverbials allows us to show relationships between ideas, logically connect sentences and paragraphs. It signals how the reader should process the information and makes writing more readable and engaging. Fronted adverbials can create cohesion when changing paragraph.

Transitional phrases		
1A. Time and sequence	1B. Time and sequence	2. Conclusion
After	Meanwhile	Consequently
Next	During	Therefore
Finally	Ultimately	In the end
3. Illustration	4. Change of direction	5. Emphasis
As an illustration	Although	Notably
Such as	But	Moreover
Including	Instead	Most important

Using hyphens

Hyphens are used to avoid confusion being caused by certain words or phrases::



Man eating shark



Man-eating shark

Vocabulary

Adjective	A word that adds more information about a noun.
Adverb	A word that adds more information about verbs, adjectives or other adverbs
Adverbial	A group of words that can function as an adverb
Antonym	A word that has the exact opposite meaning of another word
Bullet points	Organisation device used to list short phrases or items.
Ellipsis	Punctuation (...) that shows where words are left all or to create a cliff-hanger.
Noun	Names of things that we can touch (concrete) and abstract (ideas, emotions).
Synonym	a word that means the same thing as another word.
Verb	A verb is the part of speech that indicates what something does, or what it is

Using punctuation to separate clauses

Semi Colons (;), colons (:), and dashes (-) can be used to separate the boundary between two clauses.

Description: detail sentences.

Bats are excellent hunters: they track small insects using echo-location.

The first section describes the subject and the second adds extra detail.

A semi colon can be used in place of a conjunction where we want the writing to flow where the clauses are closely related.

We lost the ball too many times and we lost the game

Becomes:

We lost the ball too many times; we lost the game.

A dash is often best used to summarise:

The use of nuclear weapons during World War 2 is much debated and discussed—in short it was a divisive event.

Colons and semi-colons within lists.

If you want to list items in a list when the items are longer than one word.

CV Raman was an Indian scientist whose achievements included: becoming the first non-white winner of the Noble prize for physics; understanding the way acoustics work in instruments and the way light scatters (known as the Raman Effect).

The Female Voice Over Time: Knowledge Organiser

Women in the Middle Ages and Mary Magdalene

Women in the Middle Ages (lasting from the 5th to the 15th century) were officially required to be subordinate to some men. This would be their father, husband or any other male relative. Widows, however, were often allowed much more control over their own lives but were restricted legally.

It was a woman's responsibility to take care of her family and to oversee the running of the household. According to the teachings of the Bible, it is believed that God created Eve from Adam's rib and, having eaten the forbidden fruit, was responsible for man's expulsion from paradise. In **Medieval** art, the responsibility for this 'original sin' is often emphasised by giving a female head to the serpent who tempts Eve to disobey God. This Bible story underlined the belief that women were inferior to men and that they were morally weaker and likely to tempt men to sin.

Throughout the Middle Ages, the place of women in society was often dictated by biblical texts. The writing of **apostle** Paul, in particular, emphasised men's authority over women, forbidding women from teaching and instructing them to remain silent. However, the Virgin Mary was a contrast to this negative image: as the mother of Christ, she was the channel through which Christian women might be saved. She was sometimes described as the 'second Eve', as she was seen to have made up for Eve's sins.

Mary Magdalene, sometimes simply called Magdalene, was a Jewish woman who travelled with Jesus as one of his followers. As well as travelling with Jesus, Mary helped and supported him, indicating that she was probably relatively wealthy. In the gospels that she is referred to, she was a witness to the crucifixion of Jesus and she was also present at his burial. All four gospels identify her, either alone or as a member of a larger group of women, as the first witness to Jesus' empty tomb, and the first to testify to Jesus' resurrection. She is known in many Christian traditions as the 'apostle to the apostles.' She is a central figure in later apocryphal (a-pock- ra-full) Christian writing, which scholars do not regard as containing accurate historical information, portray her as Jesus' closet disciple and the only who truly understood his teachings.

During the Middle Ages, Mary Magdalene was combined in western tradition with Mary of Bethany and the unnamed 'sinful woman.' This led to a widespread but inaccurate belief that Mary Magdalene was a remorseful prostitute. In the four Gospels, many women were portrayed in a very negative way. These Gospels were written at least 35 and up to 95 years after Jesus' death. Many of the portrayals of women in these Gospels were shaped by the time that they were written. By the Middle Ages, the view of women was already negative so many believed in these negative portrayals of the women.

Eleanor of Aquitaine (c.1122 – 1204)

Eleanor of Aquitaine was one of the most powerful women of the Middle Ages. She would go on to become queen-consort of France and later the queen of England.

She was the eldest daughter of William, tenth Duke of Aquitaine, and was raised in one of Europe's most **cultured** courts of the time and was given an excellent education. Although it changed in later times for women, Eleanor lived during a time where women could and did inherit. When her father dies in 1137, she was left with a vast inheritance. At just 15-years-old, she became the most eligible heiress in Europe. She married Louis, heir to Louis VI of France, who later became king. During the Second Crusade, Eleanor travelled with her husband but the relationship failed and they were divorced in 1152. Divorce, as we understand it today, was different in the medieval times. The only way to end a marriage was to prove it had not legally existed in the first place. Her husband, Louis VI, claimed that they were 'too closely related' to be married which was a legitimate way to end the marriage.

Two months after the divorce, Eleanor married Henry of Anjou, who became the king of England in 1154. For nearly two decades, Eleanor played an active part in the running of Henry's empire, travelling backwards and forwards between territories in England and France.

In 1173, two of Eleanor's sons involved her in a plot against their father and, as a result, Henry imprisoned her. After Henry's death in 1189, his eldest son, Richard I, ordered his mother's release. In 1190, she acted as regent in England when Richard went to join the Third Crusade. She even played a part in the negotiations for his release after he was taken prisoner in Germany on his way home.

In 1199, Richard died and was succeeded by Eleanor and Henry's youngest son, John. Eleanor's role in English affairs then ceased, although she continued to be closely involved in those of Aquitaine, where she spent her final years. She died on 31st March, 1204, living for 82 years.

The Female Voice Over Time: Knowledge Organiser

Joan of Arc

Joan of Arc (1412-1431) and the 100 Years' War The Hundreded Year's War was a long struggle between England and France over the succession of the French throne. It lasted from 1337-1453, so might be more accurately called "The 116 Year's War." The war started off successfully for England and the English forces dominated France for decades. From 1422 onwards, however, the French crown struck back. The teenage girl Jeanne d'Arc (Joan of Arc) led the French troops to reclaim their lands from the English.

By the end of 1430, the rulers of England and France became increasingly preoccupied by the fate of an 18-year-old peasant girl called Joan of Arc. This was a time of the feudal system and any commoner, especially a woman, who led an army, would have been shocking and offensive to the ruling classes; armies were headed by kings who believed that they were ordained by God. In the December of that year, the faculty of the University of Paris wrote a letter to the king of England, who controlled Paris at that time: "We have recently heard that the woman called 'The Maid' is now delivered into your power, (and)... must humbly beseech you, most feared and sovereign lord... to command that this woman shall be shortly delivered into the hands of the justice of the Church."

However, things soon changed for Joan of Arc. Instead of expelling the English from France, Joan and the army she led suffered several military setbacks. On 23rd May, 1430, Joan was captured near Paris. Her claims that divine voices, which had told her to dress as a man and to help the French army, made her appear weak. How could the envoy of God fall so easily into enemy hands? Joan refused to deny that she heard divine voices and the punishment for this was death.

The Maid' was Joan of Arc, whose role in liberating the city of Orléans in 1429 had returned courage back into the hearts of the embattled French. Even so, her capture soon after was a morale boost for the English, who immediately set out to vilify the woman who had done so much damage to their military campaigns. Shortly after the letter from the University of Paris was written, her trial took place. After the guilty verdict was handed down, Joan was executed in Rouen on May 31 1431, by being burned alive. Once her ashes had been scattered in the Seine River, Joan's **detractors** hoped her name would be erased from history, but her name has burned more brightly in the hearts and minds of the French ever since then

Shakespeare's Women

James I and Witchcraft (1566-1625)

Following on from the death of Queen Elizabeth I, she had no direct heir to take the throne of England. James the VI of Scotland, who was the son of Mary Queen of Scots, became the King of England (James I) in 1603. Until this time, England and Scotland had been two individual sovereign states but, following on from the crowning of James I, the two countries became unified. This period of history is referred to as the Jacobean period.

During James I's reign, the 'Golden Age' of Elizabethan drama continued, with writers such as William Shakespeare, John Donne and Ben Jonson contributed to a flourishing literary culture.

King James I's visit to Denmark, a country well familiar with witch-hunts, sparked an interest in his study of witchcraft, which he considered a branch of theology. He attended witch trials in North Berwick, which was the location of the first major persecution of witches in Scotland. Several people were convicted of using witchcraft to send storms against James' ship.

James became obsessed with the threat posed by witches and wrote Daemonologie in 1597, a text inspired by his personal involvement in opposition to the practice of witchcraft and that provided background material for Shakespeare's Macbeth. King James personally supervised the torture of women accused of being witches. In King James' time, most people believed in witches, the devil, evil spirits and magic. In both England and Scotland, women (and sometimes men) suspected of being witches were arrested, questioned and were often tortured into providing a confession. In England, witches were usually sentenced to be hanged.

Word	Definition
apocryphal	of doubtful authenticity, although widely circulated as being true.
Disciple	personal follower of Christ during his life, especially one of the twelve Apostles.
Ignominy:	public shame or disgrace.
Tyranny:.	cruel, unreasonable, or arbitrary use of power or control
Modesty:	behaviour, manner, or appearance intended to avoid impropriety or indecency.
Heretic:	a person believing in or practising religious heresy. (Heresy: belief or opinion contrary to orthodox religious - especially Christian - doctrine).
'Suffrage'	means the right to vote in political elections.
Feminism	the advocacy of women's rights on the ground of the equality of the sexes
Protagonist	the leading character or one of the major characters in a play, film, novel, etc.
Antagonist	An antagonist is a character in a story who is presented as the chief enemy of the protagonist.
Infantilise	treat (someone) as a child or in a way which denies their maturity in age or experience.
Emasculate	deprive (a man) of his male role or identity.

Anita and Me: Knowledge Organiser

Plot Summary

At the beginning of the novel, Meena is caught telling a lie to her father. She finally admits to taking money from her mother to buy sweets, which leaves Meena's father furious. Although Meena's extended family make Meena feel loved, she also feels pressure to conform to a traditional image of an Indian girl: pleasant and polite, when she wants to spend time outdoors and play sports.

When Meena meets thirteen-year-old Anita Rutter, everything changes.. Anita is known for being the leader of a group of two friends, Sherrie and Fat Sally; Meena soon becomes one of Anita's followers.. At the same time, Meena finds that Sam Lowbridge, a sixteen-year-old boy who is considered the town rebel, is kind to her, despite their age difference.

As Meena gets older, she starts to notice things she didn't before. She hears someone refer to herself and her mother as "bloody wogs," which serves as her first indirect encounter with racism. At school, she notices that she is sometimes treated differently, especially after a boy in her class is relieved at being paired up with Fat Sally instead of her.

Meena continues to act out at home, getting in trouble when she uses the same foul language as Anita, shocking her entire family. Meena and Anita start spending a lot of time together and convince younger children to form a gang. Meena initially enjoys their games but one day is shocked to see Anita and other young children pick on Anita's sister, Tracey. Shocked by this public humiliation, Meena concludes that people cannot be trusted, as they turn on their friends to humiliate them.

Things come to a head between Meena and Anita when they attend Fete, a party organized by the wealthy Mr. Pembridge. At the party, Sam Lowbridge loudly voices his hatred of "wogs," and members of the crowd cheer in support. Meena had thought Sam was her friend and is shocked both by his behavior and by the fact that local villagers agree with him. She suddenly realizes that some people harbor racist beliefs. As Meena walks away, Anita stops her, commenting on Sam's good looks. Outraged, Meena calls Anita stupid, which puts a strain on their friendship.

Meena resolves to distance herself from Anita's bad influence, to focus on her family, and to devote herself to her studies—in particular, the preparation for the eleven-plus exam, which might allow her to go to a good grammar school and move out of Tollington.

Meena isolates herself to study, however, on the eve of the exam, when Meena's parents are out, Tracey comes knocking on Meena's door. She urges Meena to follow her, saying that someone is trying to kill her sister. Meena follows Tracey to the Big House, where she sees Anita and Sam having sex—a physical act that Tracey has interpreted as violence. Unable to contain her rage at discovering that Anita actually wants to have sex, Tracey attacks her and the two run off, chasing each other.

Sam then calls out to Meena, telling her that he has always had feelings for her. Meena tries to communicate to him that he has hurt her feelings, but Sam argues that he only ever meant to target "others." Tracey suddenly appears, running to attack Sam. In doing so, she accidentally falls in the pond. Realizing that the three have the potential to ruin her life, Meena decides to keep her distance.

By the end of the novel, Meena succeeds at her eleven-plus exam and her family moves out of Tollington. Eager to say a few last words to Anita, Meena leaves her a note, but never receives any response.

Key Characters

Meena Kumar

Protagonist and narrator Meena is nine years old when *Anita and Me* begins. A daughter of Indian immigrants, she has grown up in the English village of Tollington and struggles to define her cultural identity.

Anita Rutter

Anita is a domineering, self-centered thirteen-year-old girl who enjoys manipulating the people around her.

Mrs. Kumar ("Mama")

Meena's mother is known in the Tollington community as a warm, kind, and beautiful person. She has a principle of being friendly with everyone, although she makes an exception for racist and intolerant people

Mr. Kumar ("Papa")

Like his wife Mrs. Kumar, Meena's father is devoted to his family and wishes he were closer to his Indian parents, to be able to take care of them.

Nanima

Meena's maternal grandmother is a joyful, caring person who takes an immediate liking to Meena. She recognizes her granddaughter as a wild, boisterous soul—perhaps just as mischievous as Nanima herself when she was young

Tracey Rutter

Emotionally vulnerable, shy, and discreet, Tracey is the complete opposite of her rebellious older sister [Anita](#). Tracey apparently suffers from sexual violence, likely perpetrated by her father [Roberto](#).

Robert

After breaking her leg, Meena meets Robert at the hospital, where he is confined to an isolation room and separated from Meena by a window.

Uncle Alan

The youth leader of the local Methodist church and teacher of the Sunday school Meena goes to, Uncle Alan is considered handsome and charming by most women in Tollington.

Mr. Ormerod

The local shopkeeper is known for being gentle, talkative, and condescending toward foreign peoples.

Anita and Me: Knowledge Organiser

Key Context

Historical context: The Black Country

The Black Country is an area to the north and west of Birmingham in England. It is in the West Midlands. The name Black Country originates from the nineteenth century, when the region had become one of the most important parts of the Industrial Revolution in Britain.

The region was the major producer of metalwork. The scale of the metal industry and the burning of fossil fuels in the area created heavy air pollution, with a thick black smoke clouding the skies and black soot colouring the communities below. This is where the name Black Country is believed to have originated.

By the mid-twentieth century, less than a hundred years later, the industries that the area had become dependent on were now in decline. The decline of the manufacturing industries was made worse in the late 1970s and early 1980s, with over 300,000 jobs lost. Men who were now unemployed expected to find work in factories. However, they found that many of the jobs were performed by women. World War II had also devastated the country and its population. The Government focused on rebuilding the country quickly and encouraged immigration from Europe and Commonwealth countries such as India and Pakistan.

Some people resisted the changes to their communities and were prejudiced against immigrants who were perceived to be responsible for the lack of jobs.

Historical events in India

India became independent from British rule on the stroke of midnight on 15 August 1947. At the same time, parts of India were partitioned off, mainly for political and religious reasons – West Pakistan (now Pakistan) and East Pakistan (now Bangladesh) were created. The new Pakistan was to be a Muslim state while the main religions in India would be Hinduism and Sikhism. Hundreds of thousands of people were relocated, many involuntarily, to the country that was of their religion. Many people were angry and resistance caused violence and bloodshed in the regions. Other than British nationals who had lived in India, there were many people who preferred to move to the UK rather than relocate as a result of partition or to live in an independent India.

The British Nationality Act of 1948 granted the right to live in the UK for all those people who lived in colonies of the Empire. It is through this act and subsequent legislation that Meena's family came to, and stayed in, the UK.

There were direct benefits to the country. Following World War II, many industries experienced a shortage of workers. One example was the railways which found new workers amongst the Anglo-Indians (mixed race people of both British and Indian descent born in India) who had run the railways in British India and who returned to their 'home' country on and after independence in the late 1940s.

The post-war establishment of the National Health Service meant that the UK needed more and more qualified staff and more importantly qualified to British standards and in British practices. Doctors and nurses from the British Empire were the perfect solution. Also, during the 1950s and 1960s, a large number of South Asians settled in the industrial towns of the West and East Midlands and the North to work in their factories and textiles businesses.

Key vocabulary and methods

Word	Definition
Epigraph	a short quotation or saying at the beginning of a book or chapter, intended to suggest its theme.
Identity	the fact of being who or what a person or thing is. the characteristics determining who or what a person or thing is.
Literary Modernism	Literary modernism, otherwise known as "modernist literature", has its origins in the late 19 th and early 20 th centuries. At this time, writers chosen to break with the traditional ways of writing and experimented with literary form an expression.
Race	any one of the groups that human beings can be divided into based on shared distinctive physical traits. 2 : a group of individuals who share a common culture or history
Rebel	a person who opposes or fights against a government. 2 : a person who does not obey authority or follow usual standards.
Humiliation	to cause (someone) to feel very ashamed or foolish
Haughty	having or showing a proud and superior attitude
Displaced	to feel removed from the usual or proper place
Repercussion	a widespread, indirect, or unexpected effect of something said or done
Recalcitrant	stubbornly defiant of authority or being controlled
Benevolent	to be kind and to show good sense
Dignity	the quality or state of being worthy of honour and respect
Disaffected	discontented and resentful especially against authority
Persecute	to treat (someone) cruelly or unfairly especially because of race or religious or political beliefs
Maturity	the condition of being fully developed

Number Sense

Angles in parallel lines and Polygons

By the end you will be able to:

- Round numbers to:
 - powers of 10
 - 1 significant figure (s.f.)
 - Any decimal place (d.p.)
- Estimate solutions
- Calculate using order of operations
- Calculate with money, time and units of measurement

Keywords:

- Significant:** Place value of importance
- Round:** Making a number simpler but keeping its value close to what it was
- Decimal:** Place holders after the decimal point
- Overestimate:** Rounding up - gives a solution integer higher than the actual value
- Underestimate:** Rounding down - gives a solution lower than the actual value.
- Metric:** A system of measurement
- Balance:** The amount of money in a bank account
- Deposit:** Putting money into a bank account

By the end you will be able to:

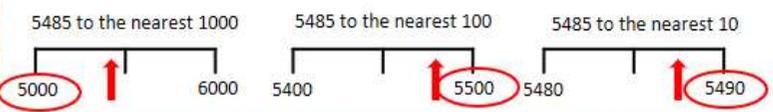
- Identify alternate angles
- Identify corresponding angles
- Identify co-interior angles
- Find the sum of the interior angles in a polygon
- Find the sum of the exterior angles in a polygon
- Find the interior angles in a regular polygon

Keywords:

- Parallel:** straight lines that never meet
- Angle:** The figure formed by two straight lines meeting (measured in degrees)
- Transversal:** A line that cuts across two or more other normally parallel lines
- Isosceles:** Two equal length lines and equal size angles in a triangle or trapezium.
- Polygon:** A 2D shape comprised of straight lines
- Sum:** Addition, total
- Regular polygon:** All the sides and therefore angles are the same size.

Round to powers of 10

If the number is half way between we 'round up'



Round to 1 significant Figure (s.f.)

Round to the first **non-zero** number (starting with the highest place value)

370 to 1 s.f. is 400

37 to 1 s.f. is 40

3.7 to 1 s.f. is 4

0.37 to 1 s.f. is 0.4

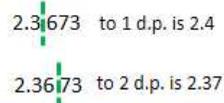
0.037 to 1 s.f. is 0.04

Round to decimal places (d.p.)

Focus on the numbers after the decimal point.

"to 1 d.p." - one number after the decimal point

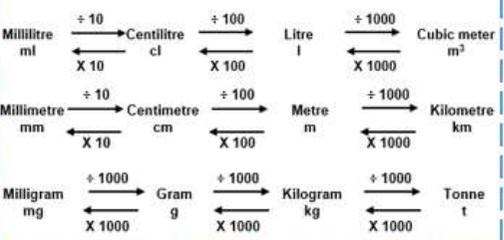
"to 2 d.p." - two numbers after the decimal point



Orders of Operation

- 1 ()
- 2 X^2 and/or \sqrt{X}
- 3 $X \div$ Carried out from left to right
- 4 $+ -$ right

Metric conversions



Estimating

Round to 1 s.f. then calculate

$3.4 + 6.7 \approx 3 + 7 \approx 10$

This is an underestimate as 3.4 was rounded down more than 6.7 was rounded up.

British Currency

Pence or £? - pick your units carefully and convert

£ will always be 2.d.p.

Debit - money is taken from your account. If you have less than £0 you are in debt.

Credit - money goes into your account, like a wage; and when you have more than £0 in your account.

Time waits for no man

1 year - the time it takes for the earth to go round the sun - **365 days** (or **366** in a leap year)

1 year - there are **12 months** in a year. **January** (31 days), **February** (28 or 29 days in a leap year), **March** (31 days), **April** (30 days), **May** (31 days), **June** (30 days), **July** (31 days), **August** (31 days), **September** 30 days, **October** (31 days), **November** (30 days), **December** (31 days)

1 year - there are **52 weeks** in a year. Monday, Tuesday, Wednesday, Thursday, Friday, Saturday and Sunday.

24 hours is a day;
60 minutes in a n hour;
60 seconds in a minute.

Analogue
5 times table for the minutes
Hours up to 12, then am or pm

Digital
0 - 11 for the morning
12 - 23 afternoon and evening

Use a number line for time calcs

EXTERIOR ANGLE SUM

The exterior angles of ANY POLYGON add up to 360°

Interior angle + exterior angle = 180° (Angles on a straight line)

VERTICALLY OPPOSITE ANGLES

$a = c$
 $b = d$

INTERIOR ANGLE SUM

4 SIDES, 2 TRIANGLES, 360°

5 SIDES, 3 TRIANGLES, 540°

6 SIDES, 4 TRIANGLES, 720°

7 SIDES, 5 TRIANGLES, 900°

ANGLE PROPERTIES OF PARALLEL LINES

CORRESPONDING ANGLES

$a = e$
 $d = h$

ALTERNATE ANGLES

$b = f$
 $c = g$

NOTICE THE PATTERN, there are always 2 fewer triangles than sides.

Take a triangle

Angles in a triangle add up to 180°

Take a quadrilateral

Angles in a quadrilateral add up to 360°

Area of Trapezia and Circles

Keywords:

- Congruent:** The same
- Area:** Space inside a 2D shape
- Perimeter:** the length around the outside of a 2D object
- 'Pi' π :** The ratio of a circles circumference to it's diameter
- Perpendicular:** Meets at an angle of 90° to a given line or surface
- Formula:** A mathematical relationship or rule given in symbols
- Infinity (∞):** A number without a given end
- Sector:** a part of a circle enclosed by two radii and an arc (slice)

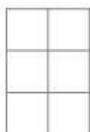
By the end you will be able to:

- Recall areas of basic 2D shapes
- Find the area of a trapezium
- Find the area of a circle
- Find the area of compound shapes
- Find the perimeter of compound shapes

Areas of Rectangles, Triangles and Parallelograms

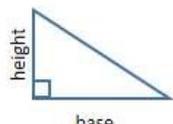
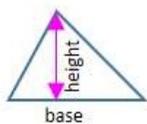
Rectangle

Base x Height



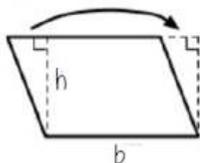
Triangle

$\frac{1}{2}$ x Base x Perpendicular height



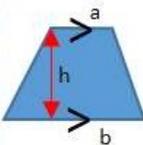
Parallelogram

Base x Perpendicular height



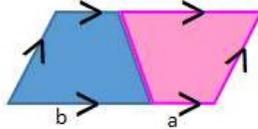
Area of a Trapezium

$\frac{1}{2}$ (Sum of the Parallel sides) x Perpendicular height



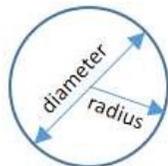
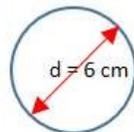
Why?
I'm glad you asked...

Two congruent trapezium make a parallelogram



Area of a Circle

π x radius²



π is usually found by pressing SHIFT then the middle bottom button on your calculator.

$d = 2r$, so $r = \frac{1}{2}d$

$$\begin{aligned} \text{Area} &= \pi r^2 \\ &= \pi 3^2 \\ &= 9\pi \text{ cm}^2 \\ &= 28.3 \text{ cm}^2 \text{ 1 d.p.} \end{aligned}$$

Area of compound shapes

- Split the shape into more manageable shapes.
- Spot rectangles, parallelograms, trapezium, semi circles or quarter circles.
- Calculate the distances needed.
- Calculate each part.
- Add the individual areas together.

$\frac{1}{4} \times \pi \times 5^2 = 19.6 \text{ cm}^2$

$\frac{1}{2} \times 5 \times 5 = 12.5 \text{ cm}^2$

Base = $17 - 5 - 5 = 7$
 $5 \times 7 = 35 \text{ cm}^2$

$19.6 + 35 + 12.5 = 67.1 \text{ cm}^2$

Perimeter of shapes

- Calculate any missing lengths.
- Make sure they're all in the same units.
- Mark as you go round the shape and sum the lengths.

Circumference of a circle = π x diameter

By the end you will be able to:

- Recognise line symmetry
- Reflect on a horizontal line
- Reflect on a vertical line
- Reflect on a diagonal line

Rotational symmetry

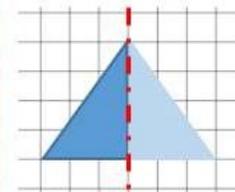
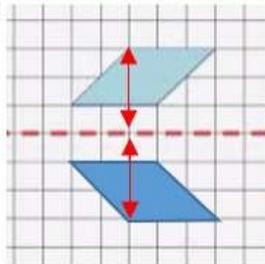
When turned slowly, how many times will it look the same?

This roundabout sign has an order of three – when it's turned, it looks the same 3 times when it get backs to the start.



Reflect horizontally or vertically

Identify the mirror line. Plot the vertices the same distance away on the other side.



Parallel to the x-axis? $y = _$
 Parallel to the y-axis? $x = _$

Diagonal?
 'Uphill' $y = x$
 'Downhill' $y = -x$

Line Symmetry and Reflection

Keywords:

- Mirror line:** a line that passes through the centre of a shape with a mirror image on either side of the line.
- Line of symmetry:** see 'mirror line'
- Reflect:** mapping one object from one position to another of equal distance from a given line
- Vertex:** a point where two or more line segments meet (a corner)
- Horizontal:** a straight line parallel to the x-axis
- Vertical:** a straight line parallel to the y-axis

Lines of symmetry

How many ways can you fold it so the shape is the same on both sides of the fold? Shapes can have ore than one line of symmetry.

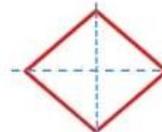
A regular pentagon has 5 lines of symmetry.



Square
4 lines of symmetry



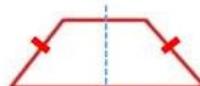
Rectangle
2 lines of symmetry



Rhombus
2 lines of symmetry



Kite
1 line of symmetry



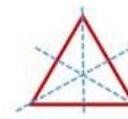
Isosceles Trapezoid
1 line of symmetry



Trapezoid
No lines of symmetry



Parallelogram
No lines of symmetry



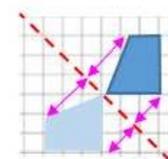
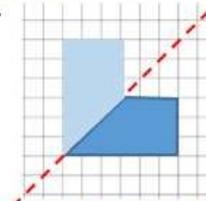
Equilateral Triangle
3 lines of symmetry



Isosceles Triangle
1 line of symmetry

Reflection on the diagonal

The mirror line is either $y = x$ or $y = -x$
 Plot the vertices the same perpendicular distance on the other side.



The Data Handling Cycle

Measures of Location (Averages)

By the end you will be able to:

- Set up a statistical enquiry
- Design and criticise questionnaires
- Draw and interpret multiple bar/line charts
- Draw and interpret line graphs
- Represent and interpret grouped quantitative data
- Find and interpret the range
- Compare distributions

Keywords:

- Hypothesis:** an idea or question you want to test
- Sampling:** the group of things you want to use to check your hypothesis
- Primary data:** data you collect yourself
- Secondary data:** data from somewhere else, i.e. the internet/ONS
- Discrete data:** numerical data that can only take set values
- Continuous data:** numerical data that has an infinite number of values (height, weight, distance, time)
- Spread:** how spread out the data is
- Average:** a measure of central tendency or the typical value of the data
- Proportion:** numerical relationship that compares two things

Keywords:

- Frequency:** how many times the data value occurs
- Range:** calculation of the spread (largest – smallest data item)
- Consistent:** A set of data that doesn't vary much
- Outlier:** a value that stands apart from the data set

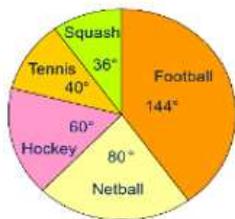
By the end you will be able to:

- Understand and use mean, mode and median
- Choose the most appropriate average
- Identify outliers
- Compare distribution using averages and range

Pie Charts

Used for showing how data breaks down into its constituent parts. When drawing a pie chart, divide 360° by the total frequency. This will tell you how many degrees to use for the frequency of each category.

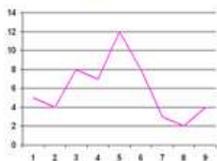
Remember to label the category that each sector in the pie chart represents.



If there are 40 people in a survey, then each person will be worth $360 \div 40 = 9^\circ$ of the pie chart.

Line Graphs

...uses points connected by straight lines to show how data changes over time.



Data gathering and representation

Tally charts to mark then state the frequency with numbers.

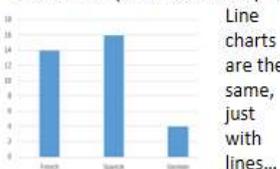
	Tally	Frequency
French		5
Spanish		5
German		4

Pictograms always need a key

Language	Pictogram	Meaning
French	●●●●●	5 students
Spanish	●●●●●	5 students
German	●●●●	4 students

Key: ● mean 4 students

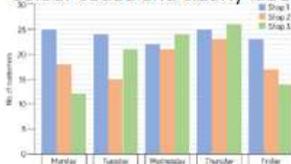
Bar charts (when discrete) need



Line charts are the same, just with lines...

Comparative Bar Charts

Data side by side
Colour coded and clearly labelled



Weight in kg (w)	Frequency (F)	Cumulative Frequency	Mid Point (MP) of w in kg	F x MP
40 < w ≤ 50	2	2	45	2 x 45 = 90
50 < w ≤ 60	3	3 + 2 = 5	55	3 x 55 = 165
60 < w ≤ 70	5	5 + 5 = 10	65	5 x 65 = 325
70 < w ≤ 90	2	2 + 10 = 12	80	2 x 80 = 160
	12			740

Estimated mean is $740 \div 12 = 61.7\text{kg}$

Median value is in position $(12 + 1) \div 2 = 7.5$

Median class is 60 < w ≤ 70

Modal class is 60 < w ≤ 70

Refer back to the hypothesis
What has your data shown?

Make a Hypothesis
What are you investigating?

Collect data
research your topic, use a questionnaire etc.

Data Handling Cycle

Analyse the data
find averages, make comparisons, draw conclusions

Display the data
bar chart, pie chart, frequency diagram etc.

The question

Be clear but not leading.
Cheese and Onion are the best crisp flavour. Yes or no?
...or maybe...
Tick your favourite crisp flavour:

- Cheese and onion
- Salt and vinegar
- Ready Salted
- Prawn Cocktail
- other

How much pocket money do you get a week?
£0
£0.01 to £2.00
£2.01 to £4.00
£4.00 +

Grouped data

If there is a large spread of data, we group it. We can easily see trends, especially when they are equal sizes.

Discrete data

Number of cars	Tally	Frequency
0 – 10		7
11 – 20		10
21 – 20		2

Continuous data

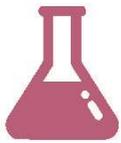
Weight (w)	Frequency
40 < w ≤ 50	2
50 < w ≤ 60	3
60 < w ≤ 70	5

Data Central Tendencies (Averages)

The **Mean** is the sum the data values divided by frequency.

The **Median** is the middle data value when arranged in size order. *Exact value* when frequency is odd; *mean of two central data values* if frequency is even.

The **Mode** is the most common data value. There can be two (**bi-modal**). More than two means there is no mode. There can also be no mode.

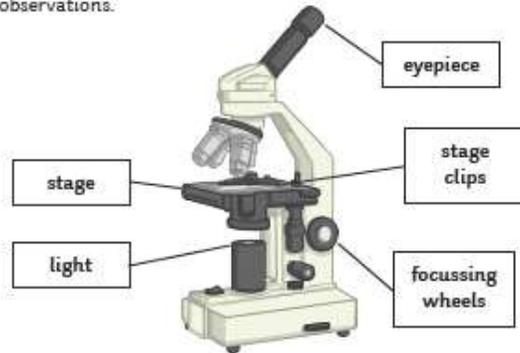


Year 9 Biology Cells 1

Required Practical

Microscopy Required Practical

- Includes preparing a slide, using a light microscope, drawing any observations – use a pencil and label important observations.



Osmosis and Potato Practical

- Independent variable – concentration.
- Dependent variable – change in mass.
- Control variable – volume of solution, temperature, time, surface area of the potato.

The potato in the sugar solution will lose water and so will have less mass at the end; the potato in the pure water solution will gain water.

Culturing Microorganisms in the Lab: Use agar jelly which contains nutrients. The bacteria will form colonies on the agar. Use inoculating loops to add the bacteria to the agar jelly. In a school lab the microorganisms are kept at 25°C to prevent the growth of any harmful bacteria.

Investigating the Effect of Antibiotics on Bacterial Growth: Place paper disks that have been soaked with different antibiotics on an agar plate that has bacteria on it. The antibiotics should diffuse on to the agar. The most effective antibiotic at killing the bacteria will have the largest inhibition zone. Be sure to use a control that has sterile water on the disk (to compare to). Leave in an incubator for 48 hours at 25°C.

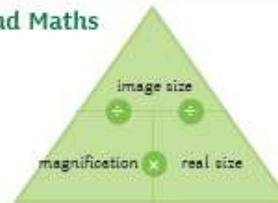
Specialised Cells

When a cell changes to become a specialised cell, it is called differentiation.

Specialised Cell	Function	Adaptation
sperm	To get the male DNA to the female DNA.	Streamlined head, long tail, lots of mitochondria to provide energy.
nerve	To send electrical impulses around the body.	Long to cover more distance. Has branched connections to connect in a network.
muscle	To contract quickly.	Long and contain lots of mitochondria for energy.
root hair	To absorb water from the soil.	A large surface area to absorb more water.
phloem	Transports substances around the plant.	Pores to allow cell sap to flow. Cells are long and joined end-to-end.
xylem	Transports water through the plant.	Hollow in the centre. Tubes are joined end-to-end.

Equations and Maths

Equation



Maths Skills

Conversions:
Micrometres to millimetres: divide by 1000.

Standard Form:
 $0.003 = 3 \times 10^{-3}$

$5.6 \times 10^{-5} = 0.0056$

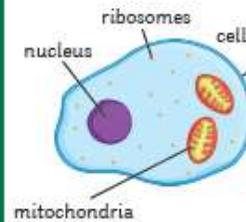
Area (to calculate the area of the inhibition zone around an antibacterial disk): $\text{Area} = \pi r^2$

Use a ruler to measure the diameter and then half it to find the radius.

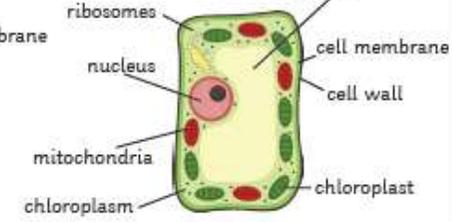
Prokaryotic and Eukaryotic Cells

Eukaryotic cells have membrane-bound organelles, for example, plant cells, animal cells and fungus cells. Prokaryotic cells do not contain a nucleus, for example, a bacterial cell.

Animal Cells



Plant Cells



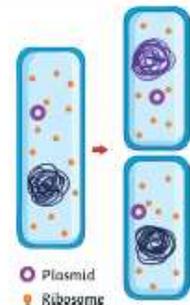
Plant and animal cells have similarities and differences:

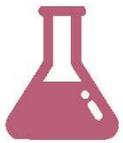
	Animal	Plant
nucleus	e	e
cytoplasm	e	e
chloroplast	X	e
cell membrane	e	e
permanent vacuole	X	e
mitochondria	e	e
ribosomes	e	e
cell wall	X	e

Bacterial Cells

Bacterial cells do not have a true nucleus, they just have a single strand of DNA that floats in the cytoplasm. They contain a plasmid.

Prokaryotic cells reproduce by binary fission - the cell splits in two.

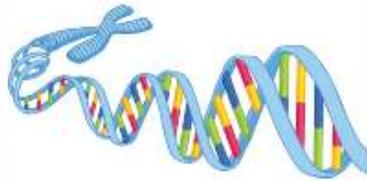




Year 9 Biology Cells 2

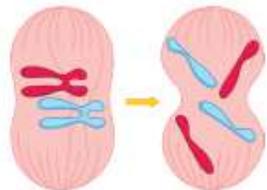
Chromosomes and Mitosis

In the nucleus of a human cell there are 23 pairs of **chromosomes**. Chromosomes contain a double helix of **DNA**. Chromosomes have a large number of genes.



The **cell cycle** makes new cells.

Mitosis: DNA has to be **copied/replicated** before the cell carries out mitosis.



Stem Cells

Embryonic stem cells are **undifferentiated** cells, they have the potential to turn into any kind of cell.



Adult stem cells are found in the bone marrow, they can only turn into some types of cells e.g. blood cells.

Uses of stem cells:

- Replacing faulty blood cells;
- making insulin producing cells;
- making nerve cells.

Some people are against stem cell research.

For Stem Cell Research	Against Stem Cell Research
Curing patients with stem cells - more important than the rights of embryos.	Embryos are human life.
They are just using unwanted embryos from fertility clinics, which would normally be destroyed.	Scientists should find other sources of stem cells.

Stem Cells in Plants

In plants, stem cells are found in the **meristem**. These stem cells are able to produce clones of the plant. They can be used to grow crops with specific features for a farmer, e.g. **disease resistant**.

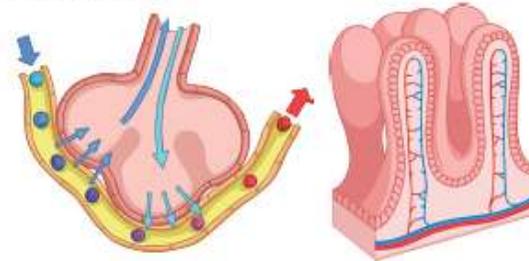
Exchange - Humans

Multicellular organisms have a large surface area to volume ratio so that all the substances can be exchanged.

Gas exchange: Lungs

The **alveoli** are where gas exchange takes place.

They have a large surface area, moist lining, thin walls and a good blood supply.

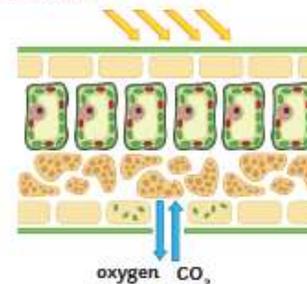


Villi: Small Intestine

Millions of **villi** line the small intestine increasing the surface area to absorb more digested food.

They are a single layer of cells with a good blood supply.

Exchange in Plants



The surface of the leaf is flattened to increase the surface area for more gas exchange by diffusion.

Oxygen and water vapour diffuse out of the **stomata**. Guard cells open and close the stomata, controlling water loss.

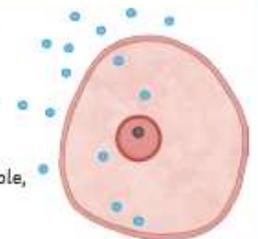
Key Processes

Diffusion is the spreading out of particles from an area of higher concentration to an area of lower concentration.

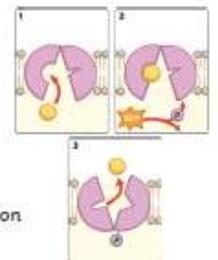
Cell membranes are semi-permeable, only small molecules can get through.

Osmosis is the movement of water molecules across a partially permeable membrane from a region of higher concentration to a region of lower concentration.

Active transport is the movement of substances **against** the concentration gradient. This process requires energy from respiration.



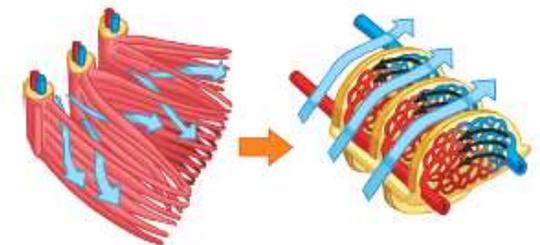
Cell Diffusion



Active Transport in Cells

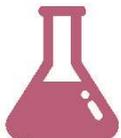
Exchange in Fish

Fish have a large surface area for gas exchange. These are called **gills**. Water enters the fish through the mouth and goes out through the gills. The oxygen is transported from the water to the blood by **diffusion**. Carbon dioxide diffuses from the blood to the water. Each gill has **gill filaments** which give the gills a large surface area. **Lamellae** cover each gill filament to further increase the surface area for more gas exchange. They have a **thin surface layer** and **capillaries** for good blood supply which helps with diffusion.



Key Vocabulary

- active transport
- alveoli
- chromosome
- diffusion
- eukaryotic
- gas exchange
- mitosis
- multicellular
- osmosis
- prokaryotic
- undifferentiated
- replicated
- specialised
- villi



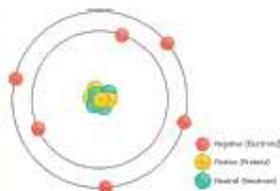
Science

Year 9 Chemistry: Atomic structure and the periodic table 1

Atoms

Contained in the nucleus are the **protons** and **neutrons**. Moving around the nucleus are the **electron shells**. They are negatively charged.

Particle	Relative Mass	Charge
proton	1	+1
neutron	1	0
electron	Very small	-1



Overall, atoms have no charge; they have the same number of protons as electrons. An ion is a charged particle - it does not have an equal number of protons to electrons.

Atomic Number and Mass Number



Elements

Elements are made of atoms with the same atomic number. Atoms can be represented as symbols.

N = nitrogen F = fluorine Zn = zinc Ca = calcium

Isotopes – an isotope is an element with the same number of protons but a **different number of neutrons**. They have the same atomic number, but different mass number.

Isotope	Protons	Electrons	Neutrons
${}^1_1\text{H}$	1	1	1 - 1 = 0
${}^2_1\text{H}$	1	1	2 - 1 = 1
${}^3_1\text{H}$	1	1	3 - 1 = 2

Compounds – a compound is when two or more elements are chemically joined. Examples of compounds are carbon dioxide and magnesium oxide. Some examples of formulas are CO_2 , NaCl , HCl , H_2O , Na_2SO_4 . They are held together by chemical bonds and are difficult to separate.

Equations and Maths

To calculate the relative atomic mass, use the following equation:

relative atomic mass (A_r) =

$$\frac{\text{sum of (isotope abundance} \times \text{isotope mass number)}}{\text{sum of abundances of all isotopes}}$$

Balancing Symbol Equations

There must be the same number of atoms on both sides of the equation:



$$\text{C} = 1$$

$$\text{O} = 4$$

$$\text{H} = 4$$

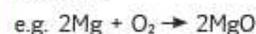
Chemical Equations

A chemical reaction can be shown by using a **word equation**.

e.g. magnesium + oxygen → magnesium oxide

On the left-hand side are the reactants, and the right-hand side are the products.

They can also be shown by a **symbol equation**.



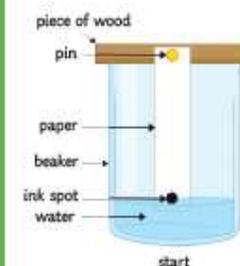
Equations need to be **balanced**, so the same number of atoms are on each side. To do this, numbers are put in front of the compounds.



Mixtures, Chromatography and Separation

Mixtures – in a mixture there are no chemical bonds, so the elements are easy to separate. Examples of mixtures are air and salt water.

Chromatography – to separate out mixtures.



Evaporation – to separate a soluble salt from a solution; a quick way of separating out the salt.



Separating out salt from rock salt:

1. Grind the mixture of rock salt.
2. Add water and stir.
3. Filter the mixture, leaving the sand in the filter paper
4. Evaporate the water from the salt, leaving the crystals.

Filtration – to separate solids from liquids.



Crystallisation – to separate a soluble salt from a solution; a slower method of separating out salt.

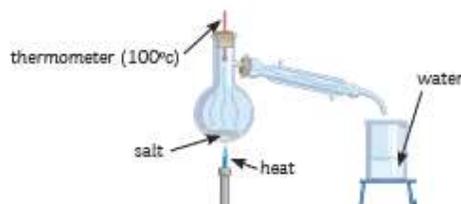


Year 9 Chemistry: Atomic structure and the periodic table 2

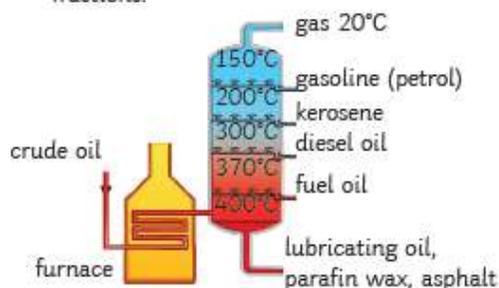
Distillation

To separate out mixtures of liquids.

1. **Simple distillation** – separating a liquid from a solution.



2. **Fractional distillation** – separating out a mixture of liquids. Fractional distillation can be used to separate out crude oil into fractions.



Metals and Non-metals

They are found at the **left** part of the periodic table. Non-metals are at the **right** of the table.

Metals

Are strong, malleable, good conductors of electricity and heat. They bond **metallically**.

Non-Metals

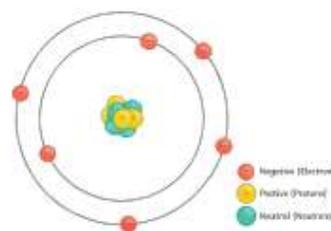
Are dull, brittle, and not always solids at room temperature.

History of the Atom

Scientist	Time	Discovery
John Dalton	start of 19 th century	Atoms were first described as solid spheres.
JJ Thomson	1897	Plum pudding model – the atom is a ball of charge with electrons scattered.
Ernest Rutherford	1909	Alpha scattering experiment – mass concentrated at the centre; the nucleus is charged. Most of the mass is in the nucleus. Most atoms are empty space.
Niels Bohr	around 1911	Electrons are in shells orbiting the nucleus.
James Chadwick	around 1940	Discovered that there are neutrons in the nucleus.

Electronic Structure

Electrons are found in shells. A maximum of two in the most inner shell, then eight in the 2nd and 3rd shell. The inner shell is filled first, then the 2nd then the 3rd shell.



Group 7 Elements and Noble Gases

Halogens

The halogens are **non-metals**: fluorine, chlorine, bromine, iodine. As you go down the group they become less reactive. It is harder to gain an extra electron because its outer shell is further away from the nucleus. The melting and boiling points also become higher.

Noble Gases

The **noble gases** (group 0 elements) include: helium, neon and argon. They are un-reactive as they have full outer shells, which makes them very stable. They are all colourless gases at room temperature.

The boiling points all increase as they go down the group – they have greater intermolecular forces because of the increase in the number of electrons.

Development of the Periodic Table

In the early 1800s, elements were arranged by atomic mass. The periodic table was not complete because some of the elements had not been found. Some elements were put in the wrong group.

Dimitri Mendeleev (1869) left gaps in the periodic table. He put them in order of **atomic mass**. The gaps show that he believed there was some undiscovered elements. He was right! Once found, they fitted in the pattern.

The Modern Periodic Table

Elements are in order of **atomic mass/proton number**. It shows where the metals and non-metals are. **Metals** are on the **left** and **non-metals** on the **right**. The **columns** show the **groups**. The **group number** shows the number of **electrons** in the outer shell. The rows are **periods** – each period shows another full shell of electrons.

The periodic table can be used to predict the reactivity of elements.

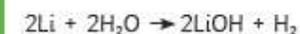
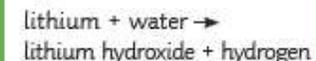
Alkali Metals

The alkali metals (group 1 elements) are soft, very reactive metals. They all have **one electron** in their **outer shell**, making them **very reactive**. They are **low density**. As you go down the group, they become more reactive. They get bigger and it is easier to lose an electron that is further away from the nucleus.

They form ionic compounds with non-metals.

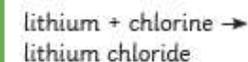
They react with water and produce hydrogen.

E.g.

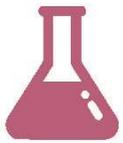


They react with chlorine and produce a metal salt.

E.g.



They react with oxygen to form metal oxides.



Year 9 Physics: Energy stores 1

Required Practical

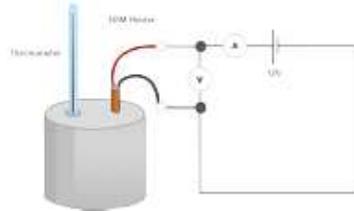
Investigating Specific Heat Capacity

independent variable – material

dependent variable – specific heat capacity

control variables – insulating layer, initial temperature, time taken

$$\Delta E = m \times c \times \Delta\theta$$



Method:

- Using the balance, measure and record the mass of the copper block in kg.
- Wrap the insulation around the block.
- Put the heater into the large hole in the block and the block onto the heatproof mat.
- Connect the power pack and ammeter in series and the voltmeter across the power pack.
- Using the pipette, put a drop of water into the small hole.
- Put the thermometer into the small hole and measure the temperature.
- Switch the power pack to 12V and turn it on.
- Read and record the voltmeter and ammeter readings – during the experiment, they shouldn't change.
- Turn on the stop clock and record the temperature every minute for 10 minutes.
- Record the results in the table.
- Calculate work done and plot a line graph of work done against temperature.

Equations

$$E = \frac{1}{2}mv^2$$

$$E_p = mgh$$

$$E_e = \frac{1}{2}ke^2$$

$$\Delta E = m \times c \times \Delta\theta$$

$$P = \frac{E}{t}$$

$$P = \frac{W}{t}$$

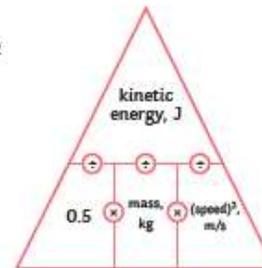
Kinetic and Potential Energy Stores

Movement Energy

kinetic energy = $\frac{1}{2} \times \text{mass} \times \text{speed}^2$

$$E_k = \frac{1}{2}mv^2$$

(J) (kg)(m/s)

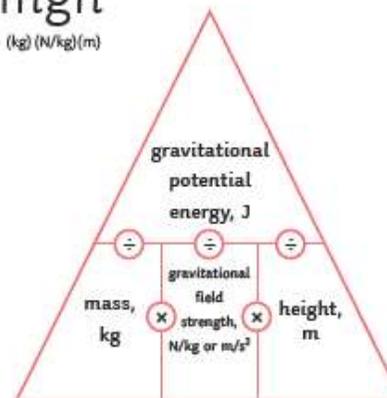


When something is off the ground, it has gravitational potential energy

gravitational potential energy = mass \times gravitational field strength \times height

$$E_p = mgh$$

(J) (kg) (N/kg)(m)



When an object falls, it loses gravitational potential energy and gains kinetic energy.

Stretching an object will give it elastic potential energy.

elastic potential energy = $\frac{1}{2} \times \text{spring constant} \times \text{extension}^2$

$$E_e = \frac{1}{2}ke^2$$

(J) (N)(m)

Transferring Energy by Heating

Heating a material transfers the energy to its thermal energy store - the temperature increases.

E.g. a kettle: energy is transferred to the thermal energy store of the kettle. Energy is then transferred by heating to the water's thermal energy store. The temperature of the water will then increase.

Some materials need more energy to increase their temperature than others.

change in thermal energy = mass \times specific heat capacity \times temperature change

$$\Delta E = m \times c \times \Delta\theta$$

(J) (kg) (J/kg°C) (°C)

Specific heat capacity is the amount of energy needed to raise the temperature of 1kg of a material by 1°C.

Year 9 Physics: Energy stores 2

Energy Stores and Systems

Energy Stores	
kinetic	Moving objects have kinetic energy.
thermal	All objects have thermal energy.
chemical	Anything that can release energy during a chemical reaction.
elastic potential	Things that are stretched.
gravitational potential	Anything that is raised.
electrostatic	Charges that attract or repel.
magnetic	Magnets that attract or repel.
nuclear	The nucleus of an atom releases energy.

Energy can be transferred in the following ways:

mechanically – when work is done;

electrically – when moving charge does work;

heating – when energy is transferred from a hotter object to a colder object.

Conservation of Energy

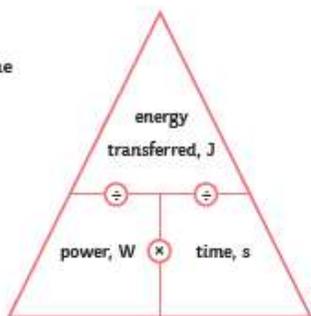
Energy can never be created or destroyed, just transferred from one form to another. Some energy is transferred usefully and some energy gets transferred into the environment. This is mostly wasted energy.

Power

Power is the rate of transfer of energy – the amount of work done in a given time.

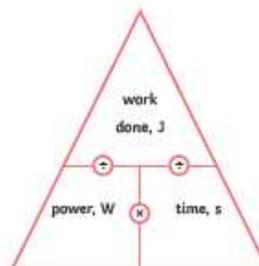
power = energy transferred ÷ time

$$P (W) = E (J) \div t (s)$$



power = work done ÷ time

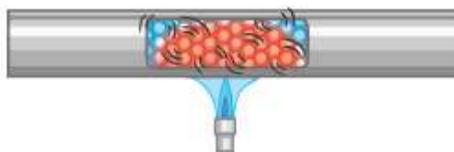
$$P (W) = W (J) \div t (s)$$



Energy Transfer

Lubrication reduces the amount of friction. When an object moves, there are frictional forces acting. Some energy is lost into the environment. Lubricants, such as oil, can be used to reduce the friction between the surfaces.

Conduction – when a solid is heated, the particles vibrate and collide more, and the energy is transferred.

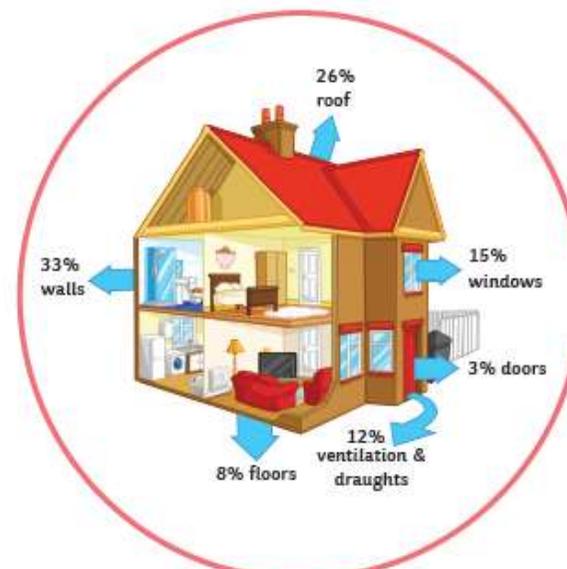


Convection – when a liquid or a gas is heated, the particles move faster. This means the liquid or gas becomes less dense. The denser region will rise above the cooler region. This is a convection current.



Insulation – reduces the amount of heat lost. In your home, you can prevent heat loss in a number of ways:

- thick walls;
- thermal insulation, such as:
- loft insulation (reducing convection);
- cavity walls (reduces conduction and convection);
- double glazing (reduces conduction).



History

Year 9 History Knowledge Organiser- Women & The Vote

Women's rights 1800s & early 1900s

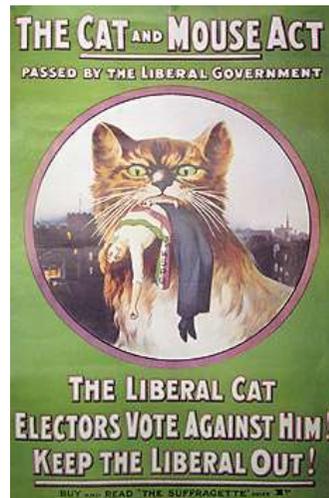
Women had no political rights, they could not vote, most jobs were closed to them & they had no control over their money once they married. The majority of lower class women were employed in menial jobs such as **domestic servants** or in the clothing trade. Women received less education than men.

Suffragists (National Union of Women's Suffrage Societies)

- Formed in 1897 by Millicent Fawcett
- Used peaceful methods as they thought they would have more chance of achieving their aims through sensible methods
- Encouraged men to join
- Trained women to speak at public meetings, produced pamphlets and supported candidates in elections who were in favour of women's suffrage.
- **BUT** some people felt it would take too long to win the campaign using these methods

Suffragettes (Women's Social & Political Union)

- Formed in 1903 by Emmeline Pankhurst & her daughters Christabel & Sylvia
- Their motto was 'deeds not words'. They were prepared to use violence to achieve their aims.
- This included throwing stones, breaking windows & bombing empty buildings. Many suffragettes went on **hunger strike** once they were in prison.



Key Terms	Definitions
Suffrage	The right to vote in elections
Domestic servants	Servants who worked in people's homes such as maids or cooks
Suffragists	Campaigned for votes for women using peaceful methods
Suffragettes	Campaigned for the vote using violent methods
Cat & Mouse Act	A law introduced to release starving suffragettes from prison & then return them later
Hunger strike	Refusing to eat. Many suffragettes were force fed as a result.
Martyr	Someone who dies for their beliefs

The Cat & Mouse Act (1913)

Many suffragettes went on **hunger strike** during their time in prison. The government was forced to release them to stop them from dying.

The **Cat & Mouse Act** allowed the government to release suffragettes from prison until their health had recovered. They were then returned to prison when their health had recovered.

Emily Davison

Dedicated **suffragette**, who went to prison a number of times for violent protests (throwing stones & setting fire to letter boxes). Derby Day 1913 - ran in front of the King's horse and died shortly after. Did she mean to kill herself?

Yes - she had tried to kill herself in prison before, so the **suffragettes** had a **martyr**
Her crimes were becoming more extreme

No - she didn't write a goodbye letter to her mother, so her friends thought she didn't mean to die
She wanted to pin a suffragette flag to the king's horse to embarrass him & gain publicity

History

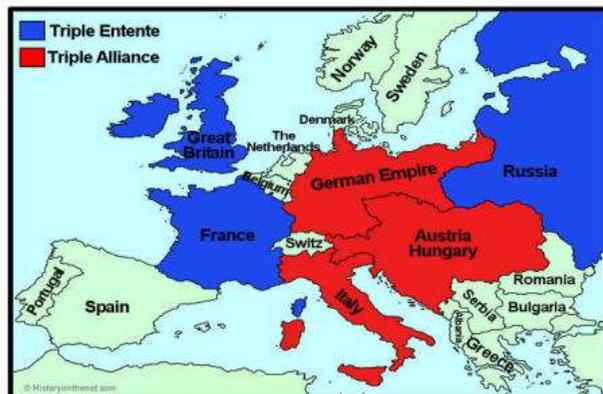
Year 9 History Knowledge Organiser- The Causes Of World War 1

The Great Powers

5 largest countries in Europe - Great Britain, France, Germany, Austria-Hungary & Italy.

All had increased their spending on their militaries (armies & navies). Britain was the largest and most powerful country, but Germany wanted to overtake her. Britain resented this.

World War One Alliances 1914



The Great Powers split into two alliances:

- **The Triple Entente**
- **The Triple Alliance**

The aim was to provide protection and support if attacked.

It could also prevent war as neither alliance was stronger.

Long term causes of the war

Militarism: Britain & Germany started a race to build the biggest fleet of Dreadnoughts. This increased tension further.

Imperialism: Britain had the largest empire in the world. Germany had a smaller empire, but wanted to become the dominate power.

Nationalism: Russia wanted a bigger empire. It was the enemy of Austria-Hungary (A-H) and wanted to help the countries in the Austro-Hungarian Empire to become independent.

Nationalism: Most of Serbia's population was made up of **Slavs**. Serbia wanted to unite all the **Slav** people in the A-H Empire. Russia wanted to help Serbia achieve it's aim.

Nationalism: In 1871 Germany took Alsace-Lorraine from French control. The French wanted revenge

Alliances: In 1839 Britain signed an agreement with Belgium. She promised to help if Belgium was attacked by Germany.

Key Terms	Definitions
Alliances	An agreement or partnership between countries
Empire	A group of countries ruled by another
Nationalist	Someone who believes in nationalism
Self-determination	The right of people to have the freedom to run their own country
Triple Alliance	Germany, Italy & Austria-Hungary
Triple Entente	Britain, France & Russia
Militarism	preparing for war building up your armed forces
Nationalism	believing that your country is the best and wanting to make it strong
Nationalist	Someone who believes in nationalism
Imperialism	wanting to have a large empire to rule over
Alliances	two or more countries agree to help each other
Slavs	An eastern-European ethnic group



Short term/trigger cause of the war

- 28th June 1914 Archduke Franz Ferdinand was assassinated in Sarajevo by Gavrilo Princip, a member of the **Black Hand**.
- Princip wanted the Slavs in the A-H empire to be freed, so a **Slav** nation under the leadership of Serbia could be established.
- Germany offered to support A-H if they declared war on Serbia.
- Russia had an **alliance** with Serbia.
- A-H declared war on Serbia and the alliances were triggered.



History

Year 9 History Knowledge Organiser- World War 1: Trenches & Weapons

Recruitment

Britain asked men to volunteer to join up. 'Pals Battalions' were formed to make volunteering more appealing but by 1916 it was clear that the **Derby Scheme** had failed and not enough men were being recruited. In January 1916 the government passed the first **Military Service Act**. All single men aged 18-41 could be called up. A second act in May 1916 extended the scheme to married men in the same age group.



Both sides 'dug in' and the war became a **stalemate**. Conditions in the trenches were very poor e.g. dangerous, open to the weather & could be attacked at any time. Men suffered from **shell-shock**, flooding, rats, injuries & boredom.

Key Terms	Definitions
Pals Battalions	Men from the same town or area were put together in the same army units
Derby Scheme	Men promised they would join up if asked to
Military Service Act	Introduced conscription (where men were forced to join up)
Stalemate	Neither side can win
Shell shock	A psychological illness which was caused by the stress and trauma of fighting. Now know as PTSD.
Duck boards	Boards placed at the bottom of the trench
Trench foot	Caused by wet conditions. It caused flesh to rot
Reconnaissance	Observing the enemy

Weapons & new technology

Zeppelins	German airships which could fly far enough to bomb Britain. Bombed Britain between 1915 & 1917 when the British developed tactics to shoot them down
Aeroplanes	Used first for reconnaissance , later for bombing. Pilots fought each other in the air & the most successful became known as 'aces'.

Tanks	Invented by the British and used first at the Battle of the Somme in 1916. Although they surprised the Germans, they were unreliable and many broke down.
Gas	The French used tear-gas against the Germans in Sept 1914 but it was the Germans who used chlorine gas first in Oct 1915. Different types of gas caused different injuries; chlorine damaged the lungs & phosgene killed it's victim in 48 hours.
The war at sea	Neither side wanted to risk their huge fleets, so there was only one battle at Jutland in 1916. There was no overall winner.



History

Year 9 History Knowledge Organiser- World War 1: Civilians and medicine

Medical care

New treatments were developed throughout the war

Shellshock: not recognised as an illness at first, officers were treated more sympathetically than ordinary soldiers. Rest was the only treatment.

Blood loss: ways of storing blood for longer for transfusions developed.

Gas gangrene: doctors would cut out infected flesh and treat with a saline solution.

Wounds: plastic surgery was developed to treat men with severe facial wounds

Key Terms	Definitions
Rationing	Restricting the amount of food people have access to
DORA	Defence of the Realm Act, gave the government powers to control Britain during the war
Munitions	Weapons and ammunition
VADS	Voluntary Aid Detachments, women who volunteered to work in hospitals
WAAC	Women's Army Auxiliary Corps, not allowed to fight but filled support roles such as cooks & drivers. Naval version WRNS.

Area	British civilians	German civilians
Bombing	First bombed by ship, Dec 1914, 127 people killed. Zeppelins started attacking in 1915, mainly attacked towns in south east & London. Later attacks by plane, deaths: 1,413, injured: 3,409.	German mainland bombed from 1918, casualties: 740, injured: 1,900.
Rationing	Food shortages caused by German attacks on ships. April 1917, only 6 weeks of wheat supplies left. Jan 1918 the government introduced rationing for sugar, meat, butter, cheese and margarine.	By 1918 food was short due to the British blockade that people were surviving on bread & turnips. Medicine and clothing was also running out.
Government control	Defence of the Realm Act (DORA) introduced Aug 1914. Brought in a range of restrictions e.g. talk about naval or military matters in public places, fly a kite & censor newspapers.	

Women - needed to replace the men who had joined up, women paid less than men in similar jobs.

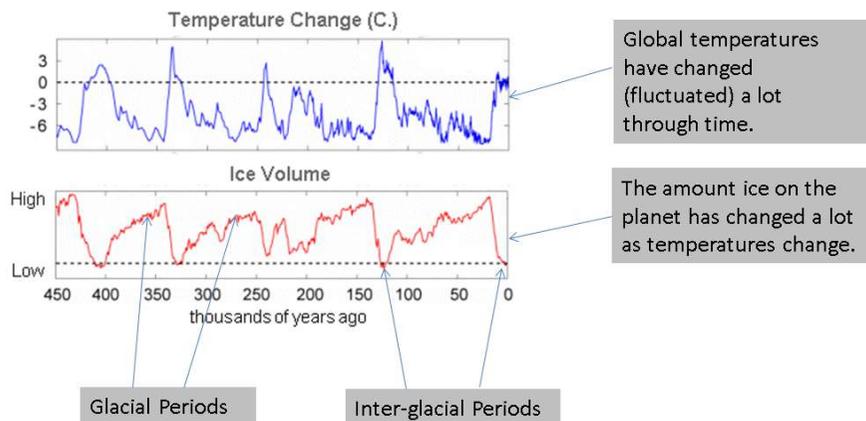
Munition factories Very dangerous: explosions & health problems. June 1917: 80% of all munitions made by women	Nursing Some women set up their own hospitals. Some nurses lived in poor conditions near to fighting.	Armed forces Women took over jobs in army, navy & air force to free up men to fight.	Home Front Women took over jobs in areas such as the police, ship building & coal mining. They also had to run their homes & families without their husbands.
---	---	--	---

What is Climate Change?

Climate change is a large-scale, long-term shift in the planet's weather patterns or average temperatures. Earth has had tropical climates and ice ages many times in its 4.5 billion years.



Diagrams showing temperature change and ice volume change over hundreds of thousands of years, highlighting the differences between glacial and inter-glacial periods:



Keyword(s)	Definition
Temperature	The degree of heat present in a substance or object, especially as expressed according to a comparative scale and shown by a thermometer.
Average	A number expressing the central or typical value in a set of data.
Global Warming	The long term rise in average global temperatures.
Glacial Periods	A period in the earth's history where it was very cold and there were large volumes of ice on the earth's surface.
Inter-glacial Periods	A period in earth's history where it was warmer and there the volume of ice on the earth's surface was much lower.
Greenhouse Gas Emissions	The release of greenhouse gases into the atmosphere, including carbon dioxide, methane and nitrous oxide.
Natural Greenhouse Effect	Greenhouse gases (including CO₂, methane and nitrous oxide) are a group of compounds that are able to trap heat in the atmosphere, keeping the Earth's surface warmer than it would be if they were not present. Without greenhouse gases, the average temperature of Earth's surface would be about -18 °C, rather than the present average of 15 °C.
Enhanced Greenhouse Effect	Where more and more greenhouse gases are released into the atmosphere due to human activity, leading to global warming.
Methane	A colourless, odourless flammable gas which is the main constituent of natural gas.

Natural Causes of Climate Change:

Changes in Earth's Orbit: Milankovitch Cycles	Milankovitch proposed 3 cycles that affect Earth's climate: (1) Eccentricity - The Earth's orbit is an ellipse. The Sun is not perfectly in the middle of the ellipse and the ellipse changes shape every 100 000 years. This means that the distance between the Earth and the Sun changes as it orbits. As the Earth orbits closer to the sun, the climate becomes warmer, and the opposite happens as it orbits away from the sun. (2) Axial Tilt - The Earth's axis is tilted on an angle. The angle of the tilt changes due to the gravitational pull of the moon. When the angle of the tilt increases, this can exaggerate the climate, so summers get warmer and winters get colder. The angle of the tilt moves back and forth every 41 000 years. (3) Precession: The Earth is not a perfect sphere, so as the Earth spins, it wobbles on its axis in 20 000 year cycles.
Solar Output (Sun Spots)	The output of the Sun is measured by observing sunspots on the Sun's surface. When sunspot activity is at a maximum, the Sun gives off more heat. When sunspot activity is at a minimum the solar output is reduced. This can lead to either higher or lower temperatures on Earth.
Volcanic Eruptions	Volcanic eruptions can have both a cooling and warming effect on the planet. When a volcano erupts it releases large amounts of dust containing gases. These can block sunlight and results in cooler temperatures. However, volcanoes release CO ₂ , which can intensify global warming leading to warmer temperatures.
Continental Drift	All of the continents are still moving. In the geological past, the UK and the rest of Europe was nearer the Equator and the UK had a desert climate (hot and dry). It has also had different climate types. If continents are in different positions on the planet, the amount of heat energy reflected or absorbed by the earth changes. This means the climate will change. Continental drift could also lead to a change in ocean currents. Ocean currents move heat around the planet and changing them can lead to changes in climate.

Human Causes of Climate Change:

Use of Fossil Fuels	Fossil fuels (coal, gas, oil) account for the majority of global greenhouse gas emissions – over 50%. Burning them releases carbon dioxide into the atmosphere. Fossil fuels are used in transportation, building, heating homes, and the manufacturing industry.
Agriculture (Farming)	Agriculture contributes to approx. 20% of greenhouse gas emissions, mainly through the production and release of methane.
Deforestation (Cutting down trees)	During photosynthesis, trees absorb CO ₂ , which reduces the amount of CO ₂ in the atmosphere. Deforestation leaves fewer trees to absorb CO ₂ .

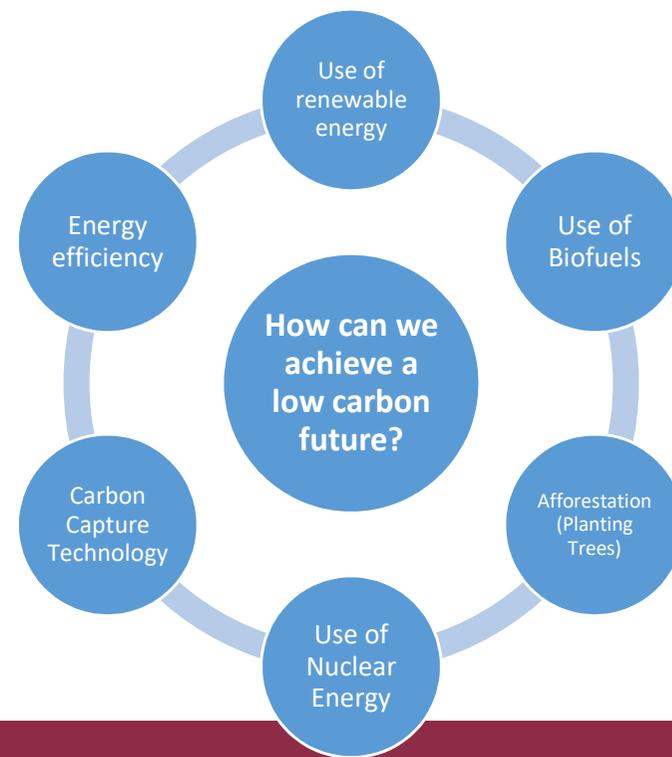
Recent Evidence for Human Caused Climate Change:

Global temperature increase	Average global temperatures have steadily increased by more than 0.6°C since 1950.
Melting ice sheets and glaciers	Many of the world's glaciers and ice sheets are melting. e.g. Arctic sea ice has decreased by 10% in 30 years.
Sea level change	Average global sea levels have risen by 10-20cms in the past 100 years. This is due to the additional water from ice and thermal expansion.

Consequences of Climate Change for the U.K:

Change in Patterns of Rainfall	Levels of summer rainfall have fallen since pre-industrial times, while winter rainfall has increased. These trends are expected to continue – meaning drier summers and wetter winters. This may lead to water shortages in the summer and flooding in the winter months.
Hotter Weather	The effects would be largest in the UK's southern areas and smallest in northern areas. Hot summers and heat waves would be more common and cold winters rarer.
Rising Sea Levels	Areas that have been identified as particularly vulnerable to coastal flood risk include South Wales, north-west Scotland, Yorkshire, Lincolnshire and East Anglia.
Issues for the NHS	Increased temperatures may result in more illness and death from heat related conditions.
Threats to Wildlife	There are warnings that rising temperatures will disrupt UK wildlife. Large storms will damage habitats and as different species' behaviour changes, the balance between predators and their prey will be affected.

Keyword(s)	Definition
Flooding	The covering or submerging of normally dry land with a large amount of water.
Afforestation	The planting of trees over a large area.
Biofuels	Fuels produced from living matter e.g. from plants or animal waste.
Renewables	A natural resource or source of energy that is not depleted by use, such as water, wind, or solar power.
Nuclear Energy	The energy released during nuclear fission or fusion, especially when used to generate electricity.
Carbon Capture	The process of trapping carbon dioxide at its emission source, transporting it to a usually underground storage location, and isolating it there.
Energy Efficiency	A way of managing and limiting growth in energy consumption, to save wildlife habitats, safeguard the planet, and make sure there is energy left for future generations.



Biomes of Russia:



Map highlighting important Physical Features of Russia.

Keyword(s)	Definition
Map Scale	The scale of a map is the ratio of a distance on the map to the corresponding distance on the ground e.g. 1 cm on a map may equal 1 km on the ground.
Vast	Of very great area or extent/of very great size or proportion.
Asian	Relating to the continent of Asia, it's people, customs or languages.
European	Relating to the continent of Europe, it's people, customs or languages.
Tundra	A vast, flat, treeless Arctic region of Europe, Asia, and North America in which the subsoil is permanently frozen.
Taiga	A type of forest located in the Earth's far northern regions, consisting mainly of cone-bearing evergreens, such as firs, pines, and spruces, and some deciduous trees, such as larches, birches, and aspens. The taiga is found just south of the tundra.
Temperate	A region or climate characterized by mild temperatures.
Desert	A desert is a barren area of landscape where little precipitation occurs and, consequently, living conditions are hostile for plant and animal life.
Sub-Arctic	Relating to the region immediately south of the Arctic Circle.
Mountain Climate	Mountain climate, also known as highland climate is a geographical term that refers to the kind of climate in the mountains.
Desert Climate	A climate typified by extremely low levels of rainfall, extreme heat in the day and cold at night.

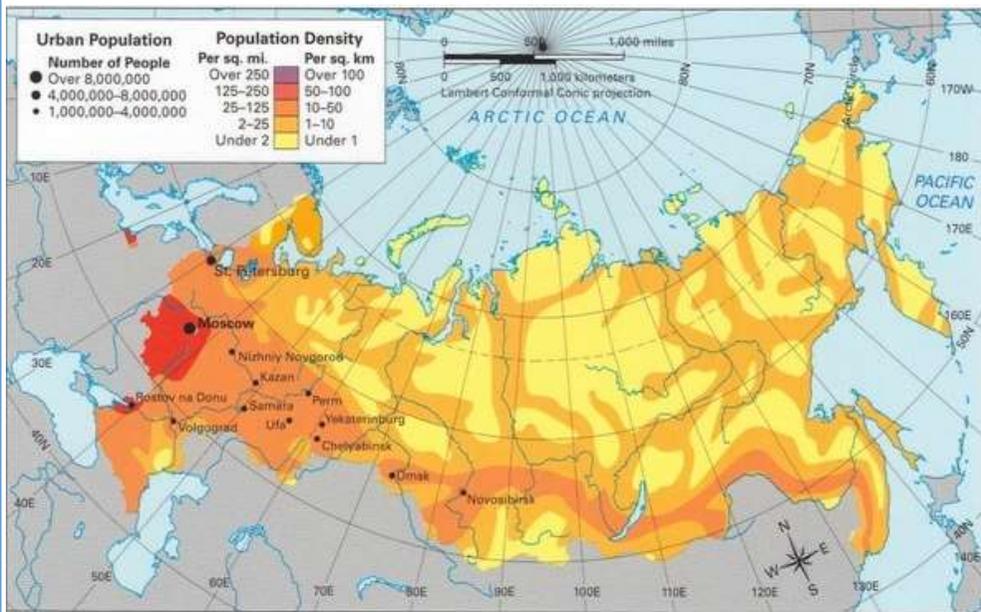
As the world's largest country by land size, Russia occupies **one-tenth of all the land on Earth**. It spans 11 time zones across two continents (Europe and Asia) and has shores on three oceans (the Atlantic, Pacific and Arctic Ocean).

Because much of the land is uninhabitable, Russia has a sparse population for its enormous land size, with 140 million inhabitants.

The Russian landscape varies from sandy and frozen deserts, tall mountains to giant marshes.

1. Black Sea	2. Barents Sea
3. Caucasus Mountains	4. Caspian Sea
5. Volga River	6. Ural Mountains
7. Ob River	8. Lena River
9. Lake Baikal	10. Central Siberia Plateau
11. Kamchatka Peninsula	12. Bering Sea

Choropleth Map showing population density of Russia:



The map above shows that the majority of Russia's population lives in the south west of the country. The primary reason for this is because the climate is warmer in comparison with the central and eastern parts of the country.

- Reasons Tourists Visit Russia:**
- Impressive Religious Sites and Architecture
 - Russian Literary History
 - Art and Museums
 - Untouched Nature and Beautiful Landscapes
 - A Strong Tradition of Music and Dance e.g. Russian Ballet.
 - The Winter Olympics City of Sochi – one of the only places in the world to host both a ski resort and a seaside resort in the same location.
 - To visit the capital city of Moscow and second city of St Petersburg

The tourist industry contributes billions of US\$ per year to the Russian economy.



Page 26 St Petersburg, Russia.

Keyword(s)	Definition
Population Density	The number of people living in an area. It is worked out by dividing the number of people in an area by the size of the area.
Choropleth Map	A thematic map in which areas are shaded or patterned in proportion to the measurement of the data being displayed on the map, such as population density, shown to the left.
Urban Population	The total population living in areas termed as urban (towns/cities).
Rural	Relating to, or characteristic of the countryside.
Urban	Relating to, or characteristic of a town or city.
Push Factor	Push Factors are negative things that make people want to move to a new area e.g. war.
Pull Factor	Pull Factors are positive aspects that attract people to move to a place e.g. good employment opportunities.
Chernobyl Nuclear Disaster (1986)	Caused by a nuclear accident that occurred in April 1986, at the No. 4 reactor in the Chernobyl Nuclear Power Plant. It is considered one of the worst nuclear disasters in history.
Nuclear Energy	The energy released during nuclear fission or fusion, especially when used to generate electricity.
Meltdown	A severe nuclear reactor accident that results from overheating.
Nuclear Fallout	The radiation that affects a particular place or area after a nuclear explosion has taken place.
Tourism	Travel for recreational, leisure, or business purposes.
Cultural Tourism	Visiting a place because of the history of those people, their art, architecture, religion(s), and other elements that helped shape their way of life.
Tourism Income	Money generated by tourism.
Tourist Resorts	A specific place where people travel to for relaxation or recreation e.g. a ski resort or a seaside resort.
Imports	The process of purchasing goods or services from overseas and bringing them into another country.
Exports	Refers to a country selling products and services to other countries around the world.
Reliance	Dependence on someone or something else.

Vocation: A strong impulse or inclination to use talents to fulfil a particular role in life or service to a community

Talent: Something somebody is good at

Parable: A story with a meaning. Found in the Bible, for example the Parable of the Good Samaritan or the Parable of the Talents

Monastery/Convent: A place where monks/nuns live. 'Open orders' are open and integrated into communities whereas 'closed orders' where they support communities but are separate from them

Sacrament of Holy Orders: The way by which Christians become a priest. Has several stages beginning with deacon, being ordained a priest, and then a Bishop. Some denominations only allow men to take the Sacraments of Holy Orders

Laity: Members of the religious congregation who are not part of the clergy (priests etc.)

Apostolic: A person who has taken religious orders (e.g. a Nun or a Monk) and who lives in and works directly with the wider community to improve their lives

Contemplative: A person who has taken religious orders (e.g. a Nun or a Monk) but who lives separate to the wider community. They have limited contact with them but may do jobs which supports them

Multi-Ethnic: A society which contains people from many different ethnic (and usually religious) origins

Racism: The act of treating somebody badly on account of them being from a particular ethnic or racial group

Prejudice: Making assumptions about somebody (based on a characteristic they possess) before actually knowing them – to 'pre-judge'

Segregation: Where people from different ethnic groups/races live and interact separately, only with others in their own ethnic group/race. Can be voluntary or forced

Discrimination: Treating somebody less favourably because of a characteristic they possess

Community Cohesion: Where people of different racial, ethnic, and other groups live together in harmony in one area

Gang: A group of people who form around common interests but who have leaders and followers based upon imbalances of power and sometimes fear

Power: The influence one person has over another

Radicalisation: Where people are taught to think in a certain way on political or social issues

Extreme: A belief which is considerably different from the 'normal' or 'correct' way of thinking in a community

Far Right: A belief that the government should use its powers to only support the dominant ethnic group within a country or area (often believing that other races/groups should be criminalised/removed)



What is a vocation?

- Vocation is about having a sense of duty
- Using your skills to the benefit of other people
- Could be related to a job or a role in society
- Examples of jobs: Teacher; nurse; counsellor
- Examples of roles in society: Parent; sister; friend

What does vocation mean to Christians? Why is it important to them?

- Christians believe that God gives them talents and it is their duty to use them to benefit others
- The parable of the Gold Coins/Parable of the Talents: Rich man gives three servants 10 gold coins each. The first two invest the money and come back with even more. The third servant buries the money and returns with the same amount. The third servant is described as 'cruel and wicked' because he does not make 'more money'. The gold coins symbolise talents! If you use them, you'll get more.

How do people commit themselves to religious life/vocation?

- To become a priest, the sacraments of holy orders must be taken. This means different things in the different denominations – e.g. a Catholic priest becomes 'married' to the church and should avoid sexual relationships.
- Monks and nuns may take holy orders and live in monasteries/convents. If they are apostolic, they work closely with and within wider communities, if contemplative, they live a life of prayer and worship separate to the general public

Should women play a more important role in the Christian church?

- In some denominations – they already do! The Church of England has had women priests since 1994 and now has women bishops
- Some of the most important people in the Bible (e.g. Mary, mother of Jesus) are women – so women have very important roles to play, but can't be priests in some denominations (e.g. Roman Catholic)
- Many people now believe in equality
- The Bible teaches: "There is neither Jew nor Greek, there is neither slave nor free, there is no male and female, for you are all one in Christ Jesus" Galatians 3: 28

What is a multi-ethnic society? Do we have one in the UK?

- People of different races, religions and ethnic groups living together in harmony
- We are encouraged to live in multi-faith society in Britain
- More successful in some areas than others
- Many rural areas continue to be much more 'white British'
- Many urban areas are segregated whereby people of certain races and cultures concentrate in certain areas and schools etc, whereas those of other races and cultures live elsewhere
- There is protection in law. It is illegal to discriminate against somebody on the grounds of race/religion etc.
- Consciously or unconsciously, prejudice does still happen

What is racism and discrimination? What does the Bible tell Christians about it?

- Discrimination means treating somebody less favourably because of their race, religion, gender etc.
- The Bible teaches people to value and care for those around them to whom they are not related: "You shall love your neighbour as yourself." There is no other commandment greater than these." (Mark 12: 31)
- The Parable of the Good Samaritan teaches Christians to not treat others less favourably because they are different to them.

Does community cohesion exist in the UK?

- To some extent
- Better in some areas than others
- Segregation has occurred in some places

Does gang violence pose a threat in the UK?

- Yes, to some people
- Young people more likely to be drawn into gang activities
- Involves the imbalance of power. A young person may be tricked into accepting gifts, but the giver may expect something back in return
- Can be tied to violence

What is radicalisation and why is it dangerous?

- Some people have 'extreme' views which are very different to what is accepted as 'normal'
- Where they use violence or intimidation to promote their views, they become extremists.
- When extremists try to convince others to take on those views (they use various tactics to do this) then they become radicals. This is dangerous and in many cases illegal

Just War Theory: An internationally agreed criteria which, if followed, makes war lawful. Follows traditional Christian rules for war.

Lawful: Allowed by law (could be the law of a country or international law)

Appropriate force: The minimum amount of force required to achieve the intended aim

Falklands Islands: Chain of islands off East coast of South America. A British overseas territory which was invaded by Argentina in 1982 (and subsequently taken back in the Falklands War)

Nuclear Weapons: Weapons which work by nuclear reaction, devastate huge areas and can kill large numbers of people

Weapons of Mass Destruction: Weapons which can potentially kill large numbers of people and/or cause a lot of damage

Chemical Weapons: Weapons which use chemicals to poison, burn or paralyse humans and destroy the natural environment

Biological Weapons: Weapons that have living organisms or infected material that can lead to disease or death

Terrorism: The unlawful use of violence, usually against civilians, to achieve a political goal

Protest: An expression of disapproval, often in a public group

Violent Protest: Using violence (for example causing an injury to others) in order to express disapproval

Retribution: An aim of punishment – to 'get your own back' on somebody for something they did to you

Deterrence: An aim of punishment – to put people off committing a crime

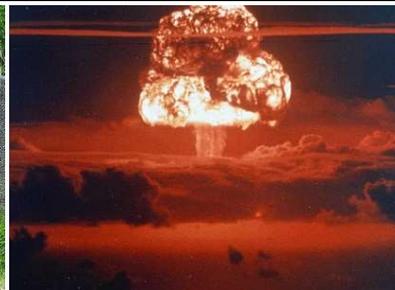
Reformation: An aim of punishment – to change somebody's behaviour for the better

Prison: A place where somebody is held as a form of punishment

Corporal Punishment: Punishment of an offender by causing them physical pain (illegal in the UK, legal in some countries such as Indonesia and Singapore)

Capital Punishment: The death penalty – the punishment whereby a person is put to death because of the crimes they have committed (illegal in the UK and EU although not in some states of the USA)

Community Service: A way of punishing offenders by making them do unpaid work in the community (sometimes called 'community payback' in the UK)



Can war be justified?

- Sometimes it may be the only option, e.g. Self defence defending somebody else etc.
- Should follow the *Just War Theory* –
 - It should have a reasonable cause
 - declared by a government
 - should be to defeat wrongdoing
 - should be the last resort (all other options other than fighting must have been tried)
 - use reasonable force
 - there must be a chance of success

What do Christians think about nuclear weapons/weapons of mass destruction?

- Most think that nuclear weapons violate the sanctity of life (life is special, only God should take it away)
- Chemical weapons also cause mass casualties, and so Christian groups are against them
- Some see military personal as legitimate targets, but civilians are defenceless and so it would be wrong to kill them
- One of the ten commandments is : “Thou shalt not murder”
- Some think they can be used in defence: “Eye for an eye”

Can religious terrorism ever be justified?

- Many religious groups are oppressed
- In countries where there is freedom of speech and a right to protest, there are other options
- Terrorism involves fear and usually the death of innocent people – it cannot be justified!
- Air India Flight 182 bombed over the Atlantic in 1985 by Canadian Sikh extremists in revenge for the Indian Government’s murder of Sikhs at the Golden Temple in Amritsar. This bombing was terrorism and could not be justified as innocent people died and fear was created

Why do people commit crimes?

- There are many reasons why people commit crimes:
 - Poverty
 - Upbringing
 - Mental illness
 - Addiction
 - Greed
 - Hate
 - Opposition to an unjust law

What are the Christian attitudes towards the treatment of criminals?

- There are many different attitudes towards criminals, often they depend on whether the Christian takes a literal (what is written is fact) or liberal (what is written should be interpreted by the individual) view of the Bible
- Christians condemn many crimes, but generally believe that criminals can be rehabilitated (made better)
- Christians often work in prisons to help with the rehabilitation of offenders
- Many Christians believe in equality so feel prisoners should be treated fairly

Do Christians believe in the death penalty?

- A very difficult topic
- Some US states which are ‘very Christian’ have the highest proportion of executions in the world
- It states in the Bible that revenge can be taken for wrongdoing: “An eye for an eye, tooth for tooth...” (Exodus 21: 24) – some take this literally, that murders should themselves be executed. Other Christians say that it should be a punishment *as bad as...*





Year 9 French Term 1: Ma vie et ma santé (My life & my health)

French	Literal ('dodgy') English
Décris toi-même.	Describe yourself.
1 À mon avis, je suis plutôt drôle et assez intelligente.	1 In my opinion, I am rather funny and quite intelligent.
2 Cependant, il faut que je dise que je suis un peu lunatique et je ne suis pas patiente non plus.	2 However, I must say that I am a bit moody and I am not patient either.
3 Je dirais que je ressemble à mon père car on a tous les deux les cheveux bruns et les yeux verts.	3 I would say that I resemble to my father because we have both the hairs brown and the eyes green.
4 Je ne suis pas du tout comme ma sœur, car je la trouve pénible et timide.	4 I am not at all like my sister because I her find annoying and shy.
Que penses-tu des réseaux sociaux ?	What think-you of the networks social?
5 Je dirais que je suis accro aux réseaux sociaux !	5 I would say I am addicted to the networks social!
6 Je passe des heures sur FB et je l'utilise tous les jours bien que ce soit une perte de temps.	6 I spend hours on Facebook and I use all the days. although it is a waste of time.
7 Je lis mes messages tout le temps et de temps en temps je partage des photos.	7 I read my messages all the time and from time to time I share some photos.
8 Il est facile d'organiser des sorties donc je pense que c'est indispensable à la vie sociale.	8 It is easy to organise some outings so I think that is indispensable (essential) to the life social.
Tu veux y aller ?	You want there to go?
9 Je vais au cinéma ce soir. Tu viens avec moi ?	9 I am going to the cinema this evening. You come with me?
10 Ça t'intéresse ? Tu veux m'accompagner ?	10 It you interests? You want me to accompany?
11 D'accord, je veux bien / Non, je n'ai pas (trop) envie.	11 OK, I want to / No, I don't (really) feel like it
12 On se retrouve quand / où ? Chez moi à 19h.	12 We meet when / where? My house at 7pm.
Qu'est-ce que tu as fait samedi soir ?	What you have done Saturday evening?
13 Samedi dernier, je suis sorti avec mon copain.	13 Saturday last, I went out with my friend (m)
14 D'abord on est allés au cinéma et ensuite on a mangé au restaurant. C'était délicieux !	14 First we went to the cinema et then we ate at the restaurant. It was delicious!
15 On a bavardé beaucoup et on a bien rigolé. J'espère que je vais le voir bientôt.	15 We chatted a lot and we had a good laugh. I hope that I am going him to see too.
La musique, c'est important pour toi ?	The music, is it important for you?
16 J'ai une passion pour la musique, surtout la musique pop.	16 I have a passion for the music, especially the music pop/
17 Je l'écoute tout le temps sur mon portable.	17 I listen all the time on my phone.
18 L'année dernière je suis allé à un festival avec mes amis.	18 Last year I went to a festival with my friends.
19 On a chanté et on a dansé toute la journée.	19 We sang and we danced all the day.
20 Il y avait beaucoup de monde. C'était incroyable !	20 There was a lot of people. It was incredible!
21 L'année prochaine je vais aller à un concert de Louane parce que j'adore ses mélodies et ses paroles.	21 Next year I am going to go to a concert of Louane because I love her melodies and her lyrics.
22	22



Sentence Builder 1 – talking about personality.

VERB PHRASE WITH 'ÊTRE'	INTENSIFIER	POSTIVE ADJECTIVE	NEGATIVE ADJECTIVE
je pense que je suis (I think that I am)	très (very)	bavardes chatty	agaçantes annoying
je ne suis pas du tout (I am not at all)	trop (too)	compréhensif/ives understanding	casse-pieds annoying
je dirais que je suis (I would say that I am)	vraiment (really)	drôles funny	débrouillards resourceful
mes amis disent que je suis (my friends say that I am)	assez (quite)	généreux/ses generous	égoïstes selfish
il faut que je dise que je suis (I must say that I am)	plutôt rather	gentilles kind	lunatiques moody
tu es (you are)		honnêtes honest	parasseux/ses lazy
il / elle est (he / she is)		marrantes funny	pessimistes pessimistic
on est / nous sommes (we are)		optimistes optimistic	pénibles annoying (a pain)
ils / elles sont (they are)		patientes patient	impatientes impatient
je le / la / les trouve (I find him/her/them)		rigolotes funny	têtues stubborn
je voudrais être plus / moins (I would like to be more / less)		sympas nice	timides shy
		timides shy	
		travailleur/ses hardworking	

SB 2 – describing a past event using the perfect tense (le passé composé)

PAST TIME PHRASE	SUBJECT + auxiliary verb 'AVOIR'	PAST PARTICIPLE + ACTIVITY
Hier yesterday	j'ai (I have)	écouté de la musique listened to music.
Samedi soir Saturday night	tu as (you have)	bu un coca drank a coke.
La semaine dernière last week	il/elle a (he/she has)	fait les magasins / une promenade done shopping / a walk.
Le week-end dernier last weekend	on a (we have)	joué à des jeux vidéos / au foot played video games/football.
L'année dernière Last year	nous avons (we have)	lu un livre read a book.
	vous avez (you pl. have)	mangé au restaurant ate at a restaurant.
	ils/elles ont (they have)	regardé la télé watched the tv.
	je suis allée / on est allées au parc	I went / we went to the park
	je suis sortie / on est sorties	I / we went out
	je suis restée / on est restées à la maison	I / we went stayed at home
	(N.B. these are irregular because they use être as the auxiliary verb)	
VERB	INTENSIFIER	ADJECTIVE
C'était it was	assez quite	amusant fun
	très very	relaxant relaxing
	plutôt rather	formidable terrific
	un peu a bit	génial great
	vraiment really	nul rubbish
		barbant tedious
		ennuyeux boring
		affreux terrible

To extend your sentences, link several events using SEQUENCERS:

d'abord = first of all / puis = then / ensuite = next / après = afterwards

Grammar – 3 tenses

PRESENT	PERFECT PAST TENSE	NEAR FUTURE
je joue (I play)	j'ai joué (I have played)	je vais jouer (I am going to play)
je regarde (I watch)	j'ai regardé (I have watched)	je vais regarder (I am going to watch)
j'écoute (I listen)	j'ai écouté (I have listened)	je vais écouter (I am going to listen)
je mange (I eat)	j'ai mangé (I have eaten/ate)	je vais manger (I am going to eat)
je lis (I read)	j'ai lu (I have read)	je vais lire (I am going to read)
je fais (I do)	j'ai fait (I did/have done)	je vais faire (I am going to do)
je bois (I drink)	j'ai bu (I have drunk/drank)	je vais boire (I am going to drink)
je prends (I take)	j'ai pris (I have taken/took)	je vais prendre (I am going to take)
je vais (I go)	je suis allée (I went)	je vais aller (I am going to go)
je sors (I go out)	je suis sortie (I went out)	je vais sortir (I am going to go out)
je reste (I stay)	je suis restée (I stayed)	je vais rester (I am going to stay)



French	Literal ('dodgy') English
Es-tu sportif/ve ?	Are you sporty?
1 Oui, je dirais que je suis plutôt sportif/ve.	1 Yes, I would say that I am rather sporty.
2 Personnellement je préfère les sports individuels mais mes amis adorent jouer en équipe.	2 Personally I prefer the sports individual, but my friends love to play in team.
3 Je fais de la natation depuis quatre ans et je pense que c'est un beau sport	3 I do swimming since four years and I think that it's a beautiful sport
4 parce que c'est bon pour le corps et le mental.	4 because it's good for the body and the mind.
5 Pour être un bon sportif/ve il faut bien dormir et être motivée.	5 To be a good sportsman/woman one must well sleep and be motivated.
Est-ce que tu manges sain ?	Do you eat healthily?
6 J'essaie de manger sain la plupart de temps.	6 I try to eat healthily the most-part of time.
7 Comme casse-croûte, je prends des fruits	7 As snack, I take of fruits
8 parce que c'est plein de vitamines,	8 because it's full of vitamins.
9 Pour le dîner je mange du poisson, de la viande et beaucoup légumes.	9 For dinner I eat of fish, of meat and lots of vegetables.
10 Cependant, hier soir j'ai mangé trop des sucreries.	10 However, last night I ate too much of sweets.
11 Bien que ce soit mauvais pour la santé, c'était absolument délicieux !	11 Although it is bad for the health, it was absolutely delicious!
Quelles sont tes résolutions pour l'avenir ?	What are your resolutions for the future?
12 Pour améliorer ma santé à l'avenir je serai moins paresseux/se et je ferai plus de sport.	12 To improve my health in the future I will be less lazy and I will do more of sport.
13 Je vais faire trente minutes d'exercice par jour. Aussi, je mangerai équilibré	13 I am going to do thirty minutes of exercise per day. Also, I will eat balanced
14 et je boirai moins de boissons gazeuses, parce que c'est mauvais pour les dents.	14 and I will drink less of drinks fizzy because it's bad for the teeth.
Es-tu en forme?	Are you in shape?
15 Moi j'adore jouer à des jeux vidéo.	15 Me, I love to play video games.
16 Mon problème, c'est que je ne suis pas très actif/ve. Alors, j'ai pris des résolutions.	16 My problem, it's that I am not very active. So, I made some resolutions.
17 D'abord je ferai plus de sport et ensuite je mangerai plus des fruits et des légumes.	17 First, I will do more sport and then I will eat more fruit and vegetables.
18 Hier je suis allée au collège à pied avec mes amis. Après on est allée au fast-food, mais j'ai bu de l'eau et je n'ai pas pris des frites !	18 Yesterday I went to school by foot with my friends. After, we went to the fast-food but I drank of water and I didn't take of fries!



Sentence builder 3 – talking about sport using frequency phrases & ‘depuis’.

VERB	FREQUENCY	‘SINCE’	TIME	CONNECTIVE + REASON
je joue au basket je joue au foot je joue au tennis je joue à la pétanque	tous les jours everyday tous les soirs every evening tous les samedis every Saturday une fois par semaine one time a week souvent often de temps en temps from time to time rarement rarely	depuis since	deux ans two years six mois six months	car c’est amusant / rigolo. because it’s fun car c’est bon pour le corps et le mental. because it’s good for the body and the mind car quand je fais ça, because when I do it, I forget my problems. parce que ça me fait du bien. because it does me good. parce que ça diminue le stress. because it reduces stress. parce que ça me détend / fatigue. because it relaxes / tires me. parce que ça booste le moral. because it boosts your mood.

SB 4 – talking about food & drink using the partitive article (du / de la / des).

MEAL	VERB	PARTITIVE ARTICLE	FOOD/DRINK	CONNECTIVE	REASON
Pour for le petit-déjeuner breakfast	je mange I eat	du some – m	pain bread poisson fish lait milk	parce que because	c’est bon pour la santé. it’s good for your health.
le déjeuner lunch	je bois I drink	de la some – f	viande meat glace ice cream	car because	c’est délicieux. it’s delicious.
le dîner dinner	je prends I take	des some - pl	boissons gazeuses fizzy drinks sucreries sweets produits laitiers dairy products légumes / fruits vegetables / fruits		c’est plein de vitamines. it’s full of vitamins.
le goûter after school snack					ça me donne de l’énergie. it gives me energy.
Comme casse-croûte as a snack		de l’ before vowel	eau water	bien que although	ce soit mauvais pour la santé. it’s bad for your health.

NEGATIVE ‘SANDWICHES’		
je ne	joue pas	I don’t play
je ne	joue plus	I no longer play
je ne	joue jamais	I never play

SB 5 – talking about future plans using the near future and the simple future tenses.

NEAR FUTURE OR SIMPLE FUTURE		
je vais être I am going to be	je serai I will be	plus saine / sportif/ve more healthy / sporty moins parasseux/se less lazy
je vais faire I am going to do	je ferai I will do	plus de sport more sport du vélo bikeriding trente minutes d’exercice par jour thirty minutes of exercise per day
je vais jouer I am going to play	je jouerai I will play	au foot / au tennis football / tennis
je vais aller I am going to go	j’irai I will go	au collège à pied et pas en bus to school on foot and not by bus
je vais manger I am going to eat	je mangerai I will eat	équilibré a balanced diet moins de suceries fewer sweets
je vais boire I am going to drink	je boirai I will drink	moins de boissons gazeuses less fizzy drinks
je vais prendre I am going to take	je prendrai I will take	les escaliers the stairs des cours d’arts martiaux karate classes

Body parts vocabulary	
l’épaule	shoulder
la bouche	mouth
la jambe	leg
la main	hand
la tête	head
le bras	arm
le dos	back
le genou	knee
le nez	nose
le pied	foot
les dents	teeth
les fesses	buttocks
les oreilles	ears
les yeux	eyes



Colour Theory

Primary colours are the three main colours, they can't be made, but are used to mix all of the other colours

Secondary colours are made by mixing two primary colours

Tertiary colours are made by mixing a primary and a secondary colour

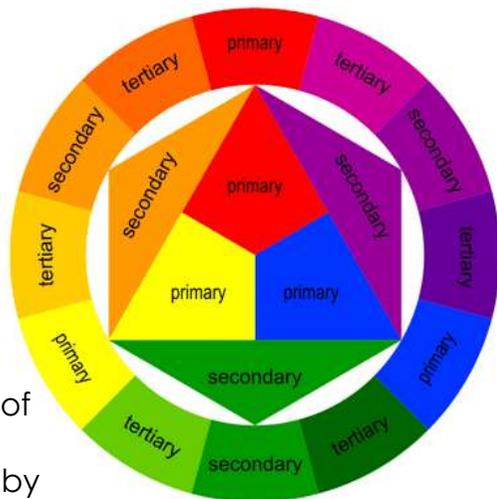
Harmonious colours are next to each other on the colour wheel

Complementary colours are opposite each other on the colour wheel

Tint – when you add white to a colour to make it lighter



Shade – when you add black to a colour to make it darker

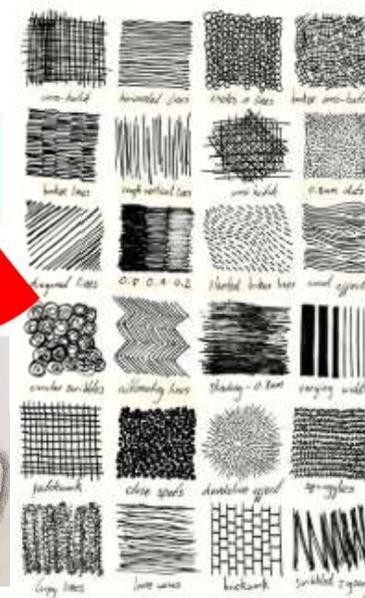


Making things look 3D:

To stop drawings looking flat use a range of tone and marks. Pressing harder and light and layering with your pencil creates different tones and adds depth.



Mark Making: To make drawings look more realistic try to use different marks on the surface. You can do this by changing the direction, pressure or length of your marks. Mark making can be used in conjunction with shading or separately.



The Formal elements of Art

Tone	How light or dark something is	
Line	A mark which can be long, short, wiggly straight etc...	
Colour	What you see when light reflects off something. Red, blue and yellow are primary colours	
Texture	How something looks or feels e.g. smooth or rough	
Pattern	A symbol or shape that is repeated	
Shape	A 2D area which is enclosed by a line e.g. a triangle	
Form	Something which has 3 dimensions e.g. a cube, sphere or a sculpture	

Technique Keywords

Media/Medium	The materials and tools used by an artist to create a piece of art
Technique	The way an artist uses tools and materials to create a piece of art
Composition	Where you place objects on the page
Highlight	The bright or reflective area on an object or piece of art, this area is closest to the light source
Shadow/Shade	The darker areas within a piece of art or object
Proportion	The size relationship between different parts e.g. height compared to width



Surrealism



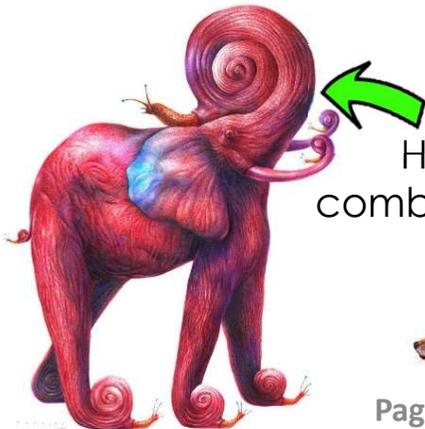
Salvador Dali –

- Spanish surrealism artists
- Known for bizarre surreal art creations
- Considered one of the greatest surrealists of all time

Surrealism: A term used to describe art that is unrealistic. Surreal art is expressive. It can express truth or fiction. Surrealism = ‘above realism’

Surrealism – Art Movement

- Began in mid 1920 France
- Born of an earlier movement called Dadaism (from Switzerland)
- Peak of the movement – 1930s



Hybrid - a thing made by combining two different elements



Annotation

You must annotate and reflect on your work as it progresses to show your intentions and ideas.

Step 1 – Describe

What is the image of?
What have you done?

Step 2 – Explain

How was this work made?
How did you produce these effects?
How did you decide on the composition?

Step 3 - Reflect

Why did you use these methods?
Why do some parts of the work ‘work’ better than others?
Why might you do things differently next time?

In this project you will explore the work of Surreal Artists and create your own surreal artistic responses.

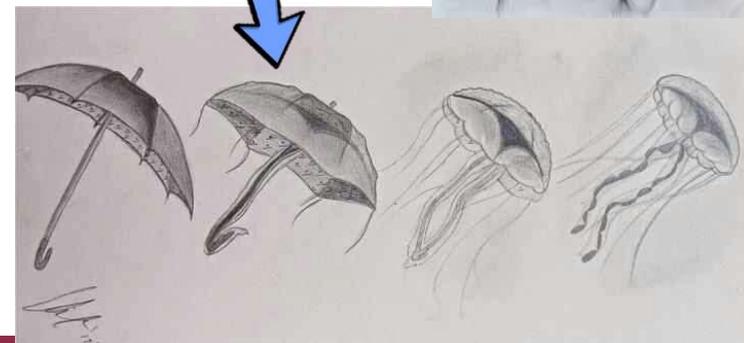
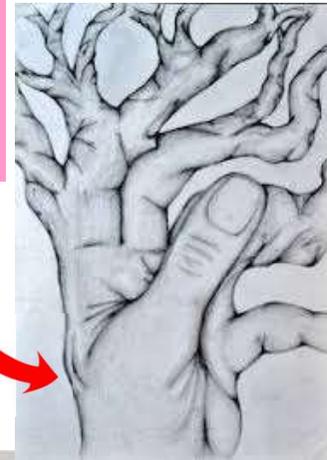
Eugenia Loli – modern surrealist collage artist



Collage is

pastings paper cut-outs onto various surfaces, it can also include other media such like painting and drawing.

Metamorphosis - a change of the form or nature of a thing or person into a completely different one.





Art

at Da Vinci Academy

Portraiture

In this project you will be exploring the features of the face, the rules of the face. You will create a successful portrait using a full range of tone and directional shading.

The **Grid method** is a tool used to help you draw whilst keeping everything in proportion. It allows you to break down drawings and concentrate on smaller sections at a time. The more squares the use the more accurate you can be.

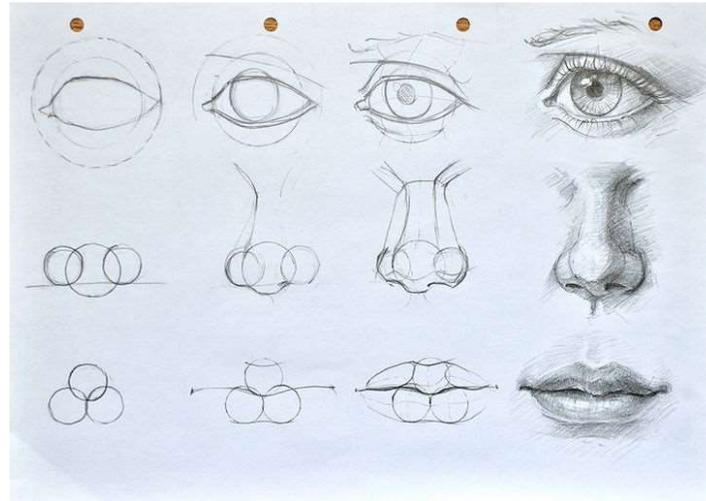


Grades of pencil

Pencils come in different grades, the softer the pencil, the darker the tone.

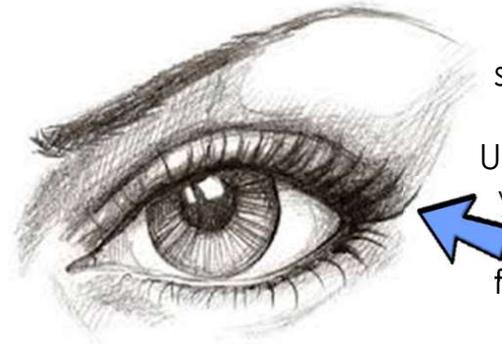
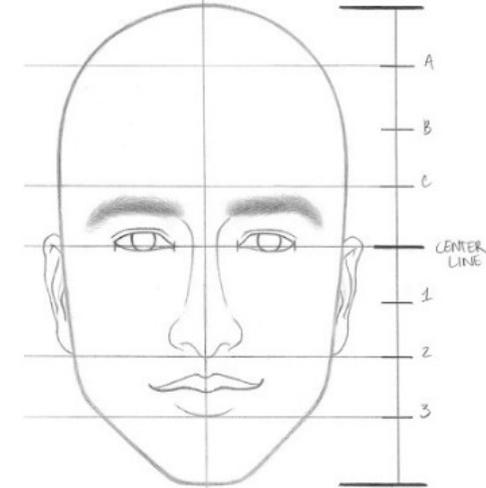
H=Hard B=Black

In art the most useful pencils for shading are 2B and 4B. If your pencil has no grade, it is most likely HB(hard black) in the middle of the scale.

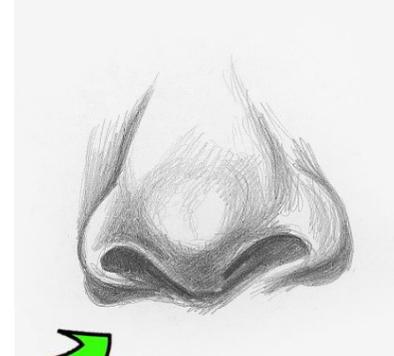


Constructing a drawing is important to ensure you keep correct proportion. Use simplified shapes to develop the structure of your drawing. Start with the largest structures first. Look at the steps above and have a go at copying them.

When drawing a portrait it is important to remember that facial features are all connected in their position to each other. What relationships can you see on the face below?



Directional shading is shading that follows the contours of an object. Using this method makes your work appear more realistic. Look at the facial features, see how the shading changes direction and curves with the shape of the feature.



When **applying tone** to a drawing you must remember to apply a range of shades first to add depth and suggest form. Secondly, add mark making to develop the texture and fine details of the object ie. Skin and hair.

Unit 1 – Creating Media

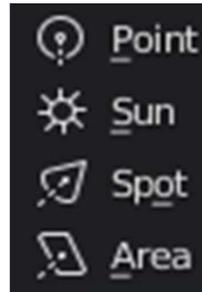


<https://www.blender.org/>

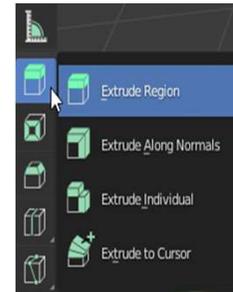
A green screen is used to superimpose computer generated images (CGI). In this section you will generate your own animation using 3D shapes, colour and lighting.

PLAN

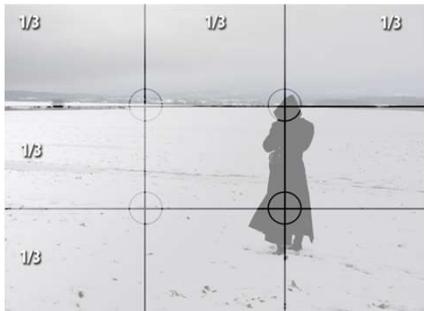
When planning your product you will need to decompose the task. Break it down into smaller manageable chunks. Storyboarding helps with this process by allowing sequences to be planned out before building a multimedia product. These show each 'scene' as it will happen.



Four types of light are used to change the shape to an organic entity.



Extruding is used to stretch a shape. (Extrusion is used to form metals or macaroni through a die).



The Rule of Thirds splits a frame into three parts vertically and three parts horizontally for decomposition.

Keyframes are the important frames which contain information of a start/end point of an action. A keyframe tells you about two things; first, it tells you what the action of your frame is at a certain point of time; second, it tells you what time that action occurs.



Pretty Polly.
Low-poly.
Few faces.
Low abstraction.

FILE TYPES

How the product is saved is very important. Some file types do not allow animation e.g. JPEG, PNG. Some file types do allow animation e.g. GIF. Ensure that products are exported into the appropriate file type otherwise it will not be multimedia!

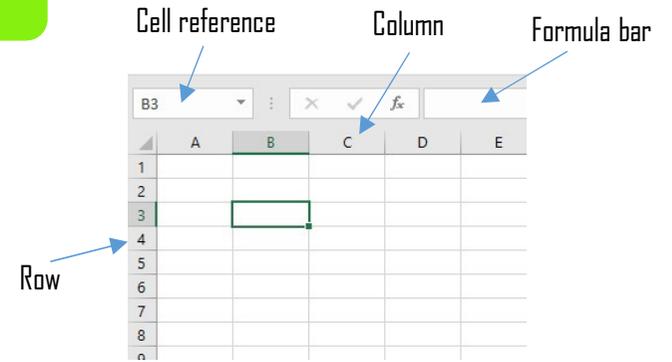
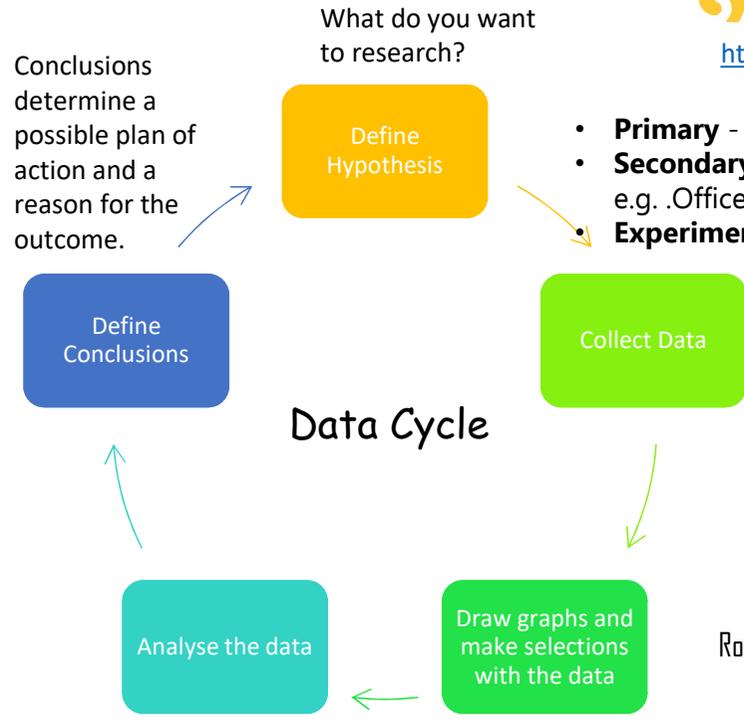
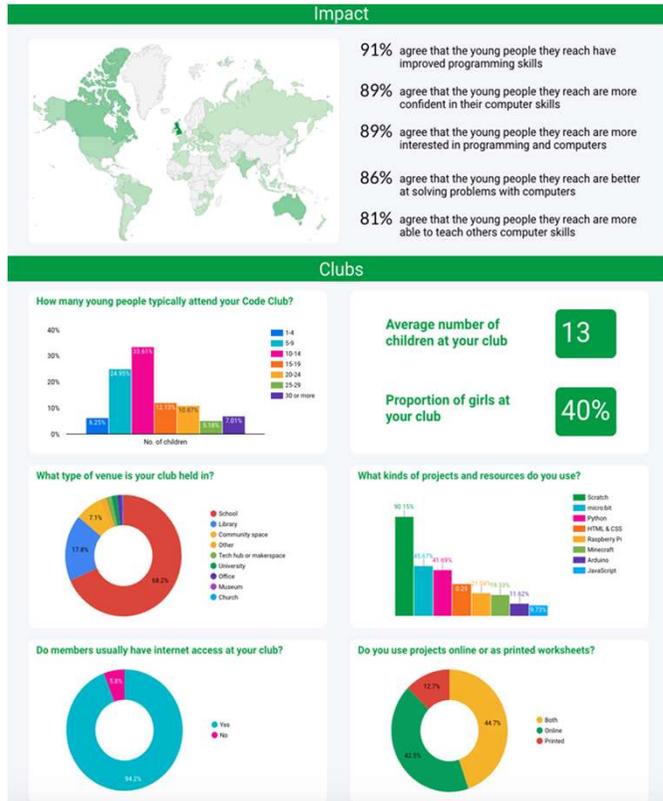
Key word	Definition
Abstraction	The level of detail needed to represent something.
Extrude	Extend the existing shape.
Keyframes	Information about the start and end of a frame in animation.
Pan	Move around the image.
Parenting	Linking objects to form shapes.
Render	Change the lighting on the image to make it realistic.
Rule of Thirds	Simplified version of the Golden Ratio.
Snap	Click one 3D object to another 3D object.
Subdivision	Smoothing the edges of a polygon.
Zoom	Get closer to the image (enlarge it).

Unit 2 – Data Delving



<https://www.gapminder.org/>

Information can be gained from analysing data.
There is also misinformation.

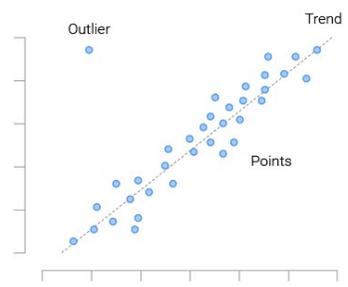


=SUM(cell ref : cell ref) adds the values in the range
 =COUNTIF(cell ref : cell ref) count the number of cells with values
 =MIN(cell ref : cell ref) returns the maximum value in the range
 =MAX(cell ref : cell ref) returns the minimum value in the range

Information can be gained from:

- By school
- Off your phone
- Your activity on the internet
- Supermarkets
- Bus routes

If it can be measured or counted it can be analysed.



<https://www.esri.com/en-us/what-is-gis/overview>

Key word	Definition
Causation	Two variables that have an effect on each other
Cell	An entity of a spreadsheet where data is stored
Cleaning	Removing outliers but not so to fudge the data
Correlation	Two variables seem to link via direct or indirect proportion
GIS	Geographic Information System
Hypothesis	A statement that is proven or disproved based on research or experiment
Outlier	A point that does not follow the trend
Return	Shows the value of the function

Softwoods- is the wood from trees such as pines, that grow quickly and can be cut easily. Softwood trees are cheaper to grow but don't last as long as Hardwoods outdoors. They have thinner leaves and don't shed their leaves in winter.



Hardwoods- Hardwood is wood from dicot trees. These are usually found in broad-leaved temperate and tropical forests. They are mostly deciduous, but in tropics and subtropics mostly evergreen. Hardwoods are more expensive than softwoods because they take longer to grow.



Polymers- A polymer is a substance or material consisting of very large molecules, you can get synthetic and natural polymers! **Polymers** are used in almost every area of modern living. Grocery bags, soda and water bottles, textile fibres, phones, computers, food packaging, auto parts, and toys all contain **polymers**. Even more-sophisticated technology uses **polymers**

Composites- Simply put, composites are a combination of materials. Composites are materials made by combining two or more natural or artificial elements that are stronger as a team than as individual players. Composites are typically designed with a particular use in mind, such as added strength, efficiency or durability.

Metals- Metals can be categorised into three groups, **Ferrous** (containing Iron) meaning they are magnetic! **Non-Ferrous** (Not containing iron) Not magnetic and **Alloys** which are a mixture of metals, (Not to be confused with Aluminium).



2D Design - CAD, CAM and CNC

CAD Computer-Aided-Design
CAM Computer-Aided-Manufacture
CNC means Computer-Numerical-Control

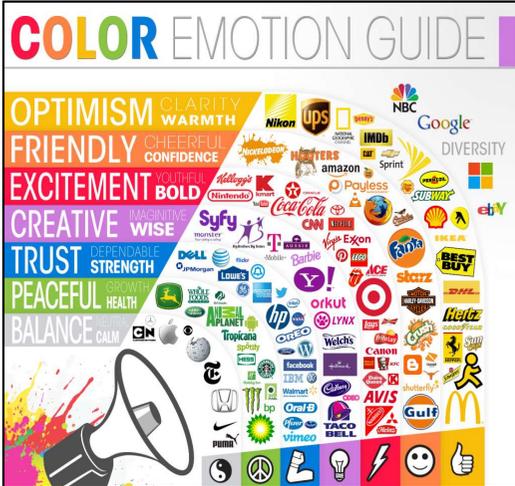
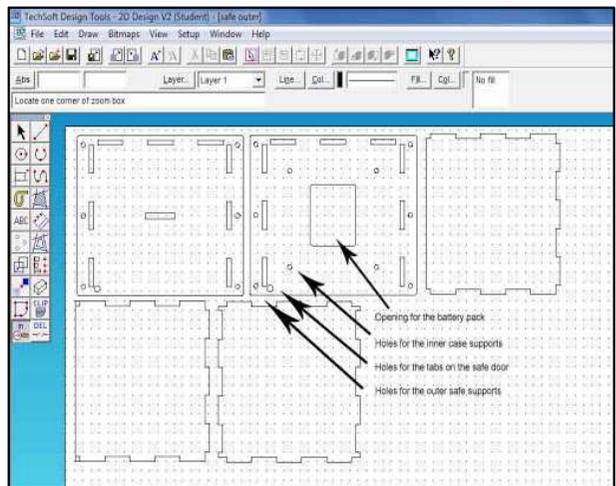
Graphic Design - The art or skill of combining text and pictures in advertisements, magazines, or books.

Tolerances

Tolerance is the allowable variation for any given size in order to achieve a proper function

Example: If I ask for a piece of wood to be cut to 500mm long and there is a tolerance of +/- 2mm, it can be 502mm or 498mm long!
 This is what is known as a tolerance

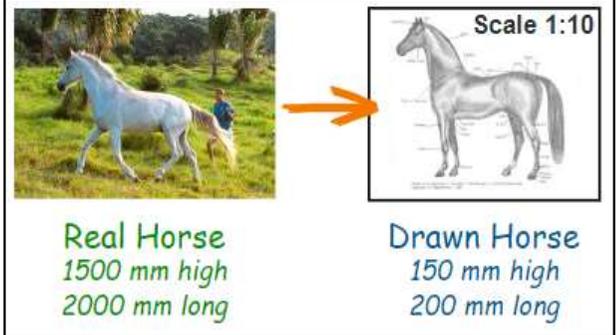
2D Design Software is an example of CAD. (Computer Aided Design) 2d design offers speed, accuracy and the capability of being modified over and over again. CAD software is used by design engineers to produce Engineering drawings to scale



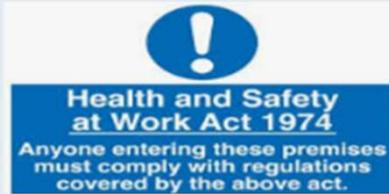
Scaled Drawings- Why use scaled drawings ?
 A drawing that shows a real object with accurate sizes reduced or enlarged. We can't design a building as big as the Eiffel tower so we have to draw it smaller. This is called a scaled drawing.

Design Brief- The design brief is a short statement of **what** you are going to make, **why** you are going to make it and for **whom** you are making it for.

TOLERANCING	SCALE	SIZE
00 = ±0.2	1:1	A4
00.0 = ±0.1		
00.00 = ±0.05		
angular = ± 0°'30		
ALL DIMENSIONS IN MM		
3rd ANGLE PROJECTION		
DO NOT SCALE		



Legislation



The Act places a general duty to 'ensure so far as is reasonably practicable the health, safety and welfare at work of all their employees'.
Employers must comply with the Act. Examples include: provide and maintain **safety equipment** and safe systems of work, provide **training**, provide a **risk assessment**
Employees have specific responsibilities too - they must: take care of their **own health and safety and that of other persons** (employees may be liable), follow the **rules** of the company.

Personal Protective Equipment Regulations 2002 (PPE)

Employers have duties concerning the provision and use of personal protective equipment (PPE) at work.

Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR), to report and keep records of:

accidents which cause **deaths, certain serious injuries, industrial diseases, dangerous occurrences**

PUWER- Provision and Use of Working Equipment Regulation-The regulations aims to keep people safe wherever equipment and machinery is used at work,

The Control of Substances Hazardous to Health Regulations 2002 (COSHH) is the law that requires **employers to control substances that are hazardous to health.** cupboard/locked/correct PPE

Working At Height



Working at Heights regulation 2005

They include all work activities where there is a need to **control a risk of falling** a distance liable to cause **personal injury**. This is regardless of the work equipment being used, the duration the person is at a height, or the height at which the work is performed.

Manual Handling Regulations 1992

The Regulations define manual handling as: "...any transporting or supporting of a load (including the **lifting, putting down, pushing, pulling, carrying or moving** thereof) by hand or bodily force". **Max load: 25kg**

The Health and Safety (Safety Signs and Signals) Regulations 1996

Mandatory signs-Must do-Blue and White-Circular

Warning Signs-Danger-Black and Yellow-Triangular



Emergency Escape-First Aid



Prohibition Signs



Assembly Point



Factors Affecting Food Choice

Many people follow '**special diets**'. They have to choose or avoid foods carefully for a range of different reasons.

Cost	Some families have to budget due to low incomes.
Age Groups	Different age groups have different nutritional needs.
Health Reasons	E.g. obesity, type 2 diabetes, anaemia, osteoporosis.
Vegetarian/Vegan	Don't eat meat/Don't eat or use ANY animal products.
Religion	E.g. Hindu, Muslim, Kosher, Buddhist, Rastafarian etc.
Intolerances	E.g. intolerance to wheat/gluten, dairy/lactose etc.
Allergies	E.g. nuts, shellfish, fish, eggs, wheat, dairy etc.

Allergy V Intolerance

Allergy

Intolerance

Keyword	Meaning
Anaemia	Too few red blood cells caused by a lack of iron in the diet.
Bowel Cancer	Can be prevented by eating dietary fibre .
Deficiency	A lack of a particular nutrient in the diet.
Diabetes (Type 2)	Caused by too much processed sugar , obesity and lack of exercise.
Fibre (NSP)	Found in fruit, vegetables, pulses and grains. Helps digest food & remove waste.
Heart Disease (CHD)	When coronary arteries get blocked with fatty deposits.
Malnutrition	Caused by a lack of nutrients in the diet.
Osteoporosis	Brittle bone disease, lack of calcium .
Sodium Chloride	Salt – linked to strokes and heart attacks.
Saturated Fat	Raises cholesterol and can be harmful.
Tooth Decay	Caused by plaque and too much sugar .

Macronutrients - We need these in large amounts.

Nutrient	Key Information	Main Functions in Body	Foods
Carbohydrates	Breaks down into starch and sugar. 1/3 of our diet should consist of starchy carbs. Wholegrain versions are higher in fibre.	Starch (complex carbohydrate) – Gives slow release energy. Fibre – Helps digestive system. Sugar (simple carbohydrate) – Gives fast energy.	Potatoes, bread, pasta, cereals, rice. (choose wholegrain versions to get more fibre).
Protein	Broken down into HBV (mainly from animal sources) and LBV (from plant sources) proteins.	Growth, repair and of muscles and cells. Body chemicals (hormones & enzymes). Secondary source of energy.	Meat, fish, eggs, nuts, seeds, pulses, lentils.
Fat	Broken down into saturated and unsaturated fats. Saturated fats are bad if eaten in large amounts.	Insulates our vital organs (heart, lungs etc) and keeps us warm. Gives concentrated energy.	Butter, lard, margarine, sunflower oil, olive oil etc.



Micronutrients - We need these in small amounts.

Vitamins	Minerals
Fat Soluble (dissolve in fat) - A, D, E, K	Calcium, Iron, Sodium, Phosphorus, Potassium, Magnesium, Zinc.
Water Soluble (dissolve in water) - B Vitamins and Vitamin C	

Environmental Issues With Food Production

Environment	Refers to the air, water and land where people and animals live.
Sustainability	We need to look after our environment by using less energy, reducing the consumption of water, avoiding waste and recycling/reusing as much as possible.
Carbon footprint	A measure of the impact your personal lifestyle has on the environment (including your food choices).
Landfill	Nearly a third of all food we produce ends up in landfill sites where it gives off methane gas as it decomposes. This adds to carbon emissions.

Composting - Left over food can be composted for the garden. (vegetable peelings, fruit waste, teabags, eggshells, toilet roll tubes, egg boxes etc). **Meat, fish and dairy products cannot be composted.**



Reuse left over food to make another dish. E.g. left over chicken in a curry, fruit in a smoothie.

Recycle/reduce as much packaging as you can. Reuse jars/containers, use bags for life, avoid buying over packaged food.



5 ways to reduce your carbon FOOTPRINT

- 1 only buy what you need**
50-60% of everything we buy ends up in landfill
- 2 eat less meat and dairy**
70% of the world's footprint is from animal products
- 3 eat less processed food**
the more processed a food is, the bigger its footprint
- 4 buy local and in season**
these foods have travelled less and stored less
- 5 grow your own food**
the ultimate in local, seasonal, unprocessed food

Food miles - The distance food travels from Farm To Fork



Some is local



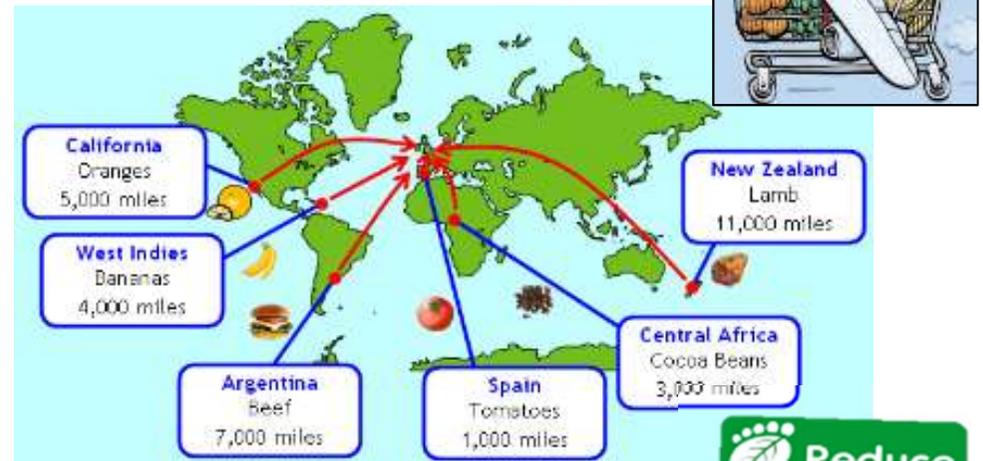
Some comes by lorry from all over the UK or Europe



Food miles

How far does our food travel to get to us?

Some is flown here from all over the world



The higher the **food miles** the bigger the environmental issues for our planet



Film reel and clapper board

Film music can be divided into two categories:

- music contained within the **action**
- background** music

Music contained within the action is usually referred to as **diegetic music**. It is included in the story, eg music heard on a radio. Most film music is non-diegetic.

Background music is often referred to as **underscoring**. It adds to the **mood** of the scene, reinforcing dramatic developments and aspects of character. or muted brass suggesting something sinister.

Film Composers to listen to:

John Williams
Hans Zimmer
Max Steiner

When the music is precisely synchronised with events on screen this is known as **Mickey-Mousing**, eg someone slipping on a banana skin could use a descending scale followed by a cymbal crash. **Mickey-Mousing** is often found in comedy films.

In a film score, the **orchestration** (Organisation of musical instruments for an ensemble performance) and **instrumentation** (Particular type of instrument used in a music) can be very important.

Instrumental colour can suggest images, eg bagpipes evoking Scotland

Music is an important part of film. Film music serves to:

- establish atmosphere, time and place
- move the action forward
- describe character
- accompany scene changes
- add to the dramatic impact
- provide continuity across edits

Periods of Music History



Keyword	Definition
MOTIF	A theme/melody that recurs, usually representing an idea.
LEIT MOTIF	A specific motif that represent a certain character
DIEGETIC	Where music in the film CAN be heard by the characters
NON-DIEGETIC	Where music in the film CANNOT be heard by characters/background music
MICKEY MOUSING	Sound mocking the action on screen
ORCHESTRATION	To arrangement used for an orchestra piece
INSTRUMENTATION	The type of instruments used in a piece

Music Through Time

Baroque to Classical

Baroque music comes from the period between approximately 1600 and 1750. Famous composers from this period include:

- Antonio Vivaldi
- George Frederic Handel
- Johann Sebastian Bach

Baroque music is recognised for its use of:

- repetition
- scales
- sequences

Melodies are played alongside each other to create **polyphonic** music that contains **contrapuntal** phrases. These phrases weave in and out of the music as melodies are passed around from player to player. The result sounds as if the instruments are imitating each other. This will sometimes happen through the complete piece, sometimes only for part of it.

- strings** - violin, viola, cello and double bass
- woodwind** - recorder or wooden flute, oboe, and bassoon
- brass** - sometimes trumpet and/or horns
- percussion** - timpani (kettledrums)
- key** - harpsicord

Baroque instruments had very limited **dynamic** contrast. Composers would ask their performers to play softly in the dynamic of piano and loudly in the dynamic of forte. There was very little dynamics in between. The harpsichord made a short, staccato sound as the strings were plucked inside the instrument. If a Baroque composer wanted a longer sound on the harpsichord, he would have had to add ornaments such as trills and mordents.

BAROQUE



BAROQUE

[J.S. Bach - Toccata and Fugue in D minor BWV 565](#)
– [YouTube](#)

Keyword	Definition
BAROQUE	Period of Music between 1600-1750 (key composers include Bach and Handel)
CLASSICAL	Period of Music between 1750-1830 (key composers include Beethoven and Mozart)
ROMANTIC	Period of Music between 1800s (key composers include Chopin, Grieg)
ORNAMENTATION	Adding to the melody – extra notes or changing rhythms
PEDAL	A sustained note (a held note)
INCIDENTAL	Music used in film or a play to create atmosphere
MOTIF	A short music idea that comes back

CLASSICAL

The classical music era is usually seen as the years between approximately 1750 and 1820. Famous composers from the classical period include:

- Joseph Haydn
- Wolfgang Amadeus Mozart

Classical music is recognised for:

- beautiful melodies
- **homophonic** accompaniments

It introduced the **alberti bass line**, a chordal pattern where the notes of the chord are broken up. It also continued to use ornamentation in melodies for decoration. The opening of Mozarts 'Piano Sonata, K545' is a well known example of alberti bass. The audio clip below also features trills as ornament

CLASSICAL

[Beethoven's Symphony No.5, 1st movement | conducted by Paavo Järvi – YouTube](#)



Instruments

Classical composers built their orchestras on the foundations of baroque music but they were bigger in size.

They were based on:

strings - violin, viola, cello, double bass, and sometimes guitar

woodwind - recorder or wooden flute, oboe, bassoon and clarinet

brass - trumpet, horns (with valves by the end of the period)

percussion - timpani (kettledrums) and sometimes triangle, hand cymbals and bass drum

key - fortepiano

Classical orchestras were bigger in size and as instrument building improved so did the range of dynamics in the performance. The harpsichord was replaced with the fortepiano, the precursor to today's modern piano.

ROMANTIC

Romantic music developed directly from the classical period. There is no clear date as to when classical ended and romantic began but the period was approximately from 1780 to 1910.

Famous composers from this period include:

- Peter Tchaikovsky
- Edvard Grieg
- Johannes Brahms

Beethoven's early compositions are called classical. As his music developed with new instruments and techniques, his later works can be called romantic.

Romantic music focuses on provoking emotion and passion. Music was used to evoke stories, places or events.

Nature was a particularly popular subject. For example Mendelssohn's "Hebrides Overture" was inspired by the composer's trip to the island of Staffa.

Romantic music can be recognised for:

larger orchestras

use of **rubato** - slight speeding up and slowing down of the music

adventurous harmonies and modulations

All of these features create interest and variety for the listener.

Instruments

During the romantic period, the orchestra had become a great force due to its increasing size including the following:

strings - larger string section

woodwind - flutes and piccolo, oboes and clarinets, bassoon and double bassoons

brass - trumpets, trombones and French horns (tuba added later in the period)

percussion - full percussion section

key - piano

ROMANTIC

[Grieg: Peer Gynt Suite No. 1, "In the Hall of the Mountain King" - YouTube](#)



Keywords

BAROQUE

CLASSICAL

ROMANTIC

ORNAMENTATION

PEDAL

INCIDENTAL

MOTIF



PE

at Da Vinci Academy



The Rules

Starting the game: A game starts with a tip-off. The referee throws the ball into the air in the centre circle and two opposing players jump up and try to tap it away to gain possession. The ball must clear the centre circle.

Method of scoring: Points are scored when the ball goes through the basketball hoop. If a successful shot is taken inside of the 3 point line, then 2 points will be awarded. If a successful shot is taken from outside of the 3 point line, then 3 points will be awarded. 1 point can also be scored from each successful free throw taken.

Fouls: A foul has been committed if a player hits, pushes, holds or charges at an opponent. If a foul is made during game play, there will be a turnover taken from the side line or baseline. If a foul is made whilst a shot is being taken, then a free throw will be awarded.

Violations:

Double dribbling: A player must not dribble with 2 hands or pick up the ball after dribbling and start dribbling again.

Travelling: A player can only take 2 steps after catching the ball.

Back court violation: Once an attacking player has dribbled the ball forward past the half way line, they must not take it back across whilst it is in their possession.

Time restrictions: The team in possession has 24 seconds on the shot clock, to make a shot.

If a violation is made, a turnover will occur and the ball will be given to the opposing team.

Basketball



Key Terminology



KS3



Lesson Overview

1. Dribbling
2. Passing and receiving
3. Defending
4. Shooting
5. Lay up and rebounding
6. Game play
7. Assessment

Positions



Passing - Sending the ball

Receiving - Catching the ball

Dribbling - Running whilst bouncing the ball in an attempt to beat an opponent

Man marking - Guarding a specific player to prevent them from having success on the ball

Zonal marking - Guarding a specific player to prevent your opponents from gaining success

Tackling - To dispossess an opponent of the ball

Interception - Preventing a pass between players

Attacking - Making an attempt to score by passing or driving forward with the ball

Layup - A shot taken close to the hoop whilst a player is moving

Free throw - A shot given to a player after a foul, taken from the free throw line

Rebound - Gaining possession of the ball after a shot

Turnover - When an offensive team loses possession of the ball

Travelling - Moving without dribbling the ball

Point guard (PG) - They are quick and lead their team to assists and can create opportunities for themselves.

Shooting guard (SG) - Score 3 pointers with ease, create space and are strong defenders.

Small forward (SF) - Responsible for scoring, defending and often rebounds.

Power forward (PF) - Score close to the basket and mid-range jump shots.

Centre (C) - Usually plays near the baseline or close to the basket.



PE

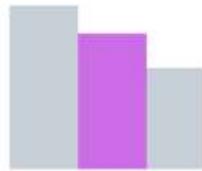
at Da Vinci Academy

Dance

KS3

Levels

Distance from the ground:
low, medium or high.



Motif

A movement phrase encapsulating an idea that is repeated and developed throughout the dance.



Timing

The use of time or counts when matching movements to sound and/or other dancers.



Key Terminology

Formations Shapes or patterns created in space by dancers.



Choreography The art of creating dance.



Canon
When the same movements overlap in time.



Unison

Two or more dancers performing the same movement at the same time.



Extension Lengthening one or more muscles or limbs.

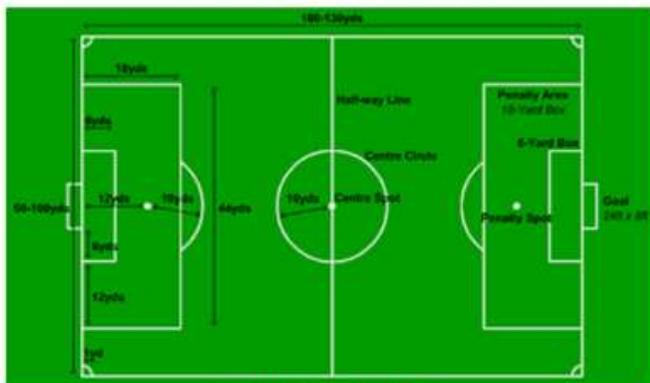




PE

at Da Vinci Academy

The Football Pitch



KEYWORDS

Passing - Sending the ball to another player

Receiving - Getting the ball from another player

Dribbling - Running with the ball in an attempt to beat an opponent

Jockeying - Is the defender's skill of keeping between the attacker and their intended target (usually the goal)

Tackling - To dispossess an opponent of the ball

Marking - A way to prevent your opponent from receiving or passing the ball, or taking a shot

Attacking - Making an attempt to score

Crossing - A cross is a medium to long range pass from a wide area of the field towards the opposition's goal

Shot - Attempting to score a goal

Offside - Moving into an area where you're not permitted

Interception - Preventing a pass between players

Football

Lesson Overview

1. Passing and receiving
2. Dribbling and turns
3. Shooting
4. Heading
5. Attacking Principles
6. Defending Principles
- 7-12 Full and Conditioned games



Rules of the Game

Starting the game - The game begins with the toss of a coin, and the winning captain decides which goal they wish to defend.

Method of scoring - A goal is scored when the ball has completely crossed the goal line, provided that no other infringements have taken place.

Fouls - A foul has been committed if a player trips, kicks, pushes, charges another player recklessly, striking of any kind, makes a tackle but connects with the player before the ball, deliberately handles the ball, obstructs an opponent or prevents them from releasing the ball.

Free kicks - Used to restart play after a foul or infringement has taken place. They are usually taken from the place from which the offence was committed. Free kicks can be direct (where the free kick taker may score directly) or indirect (where the free kick taker and a second player must touch the ball before a goal can be scored).

Penalty kick - A penalty kick is awarded for a foul committed by a defending player in their own penalty area. The kick is taken from the penalty spot and all other players except for the goal keeper and penalty taker must be at least 12 yards from the spot.



Player Positions

KS3

Goalkeeper - To prevent the opposing team from scoring.

Defenders - A defender is an outfield player whose primary role is to prevent the opposing team from scoring goals.

Midfielders - Midfielders are generally positioned on the field between their team's defenders and forwards.

Forwards - Forwards are the players on a football team who play nearest the opposing team's goal, and are therefore the most responsible for scoring goals.



PE

at Da Vinci Academy

The Netball Court



Lesson Overview

1. Footwork
2. Passing and receiving
3. Timing of pass
4. Attacking play
5. Shooting
6. Defensive play
7. Assessment

Netball



Player Positions

KS3

Goal Shooter (GS) - To score goals and to work in and around the circle with the GA.

Goal Attack (GA) - To feed and work with the GS and to score goals.

Wing Attack (WA) - To support the circle players, giving them shooting opportunities.

Centre (C) - To take the centre pass and to link the defence and the attack.

Wing Defence (WA) - To look for interceptions and prevent the WA from feeding the circle.

Goal Defence (GD) - To win the ball and reduce the effectiveness of the GA.

Goal Keeper (GK) - To work with the GD and to prevent the GA/GS from scoring goals.

Footwork

A player can receive the ball...

1. With both feet grounded or jump to catch the ball and land with both feet at the same time. The player can then choose one foot to move (not both).
2. Landing on one foot then the other. The first foot is the landing foot and this foot cannot be moved, other than to pivot on the spot. The second foot can move.

If you break the footwork rule, a free pass will be awarded to the other team.

Key Vocabulary

Passing - sending the ball

Receiving - catching the ball

Footwork - how you land when in control of the ball

Dodging - a way to change direction quickly

Defending - preventing the other team from gaining possession of the ball and scoring

Attacking - making an attempt to score

Marking - a way to prevent your opponent from receiving or passing the ball or shooting

Shoot - attempt to score a goal

Offside - moving into an area where you're not permitted

Interception - preventing a pass between players

Throw in - a free pass taken off court

Centre Pass - taken to start or restart the game

Free Pass - awarded when there is an infringement of the rules by a player

Penalty Pass - as above, when two players are involved

Goal Third & Centre Third - areas of the court

Rules of the Game

Held ball - A player is only allowed to hold the ball for 3 seconds. A free pass is awarded to the opposing team if the ball is held for longer than 3 seconds.

Obstruction - A player attempting to intercept the ball must be at least 3ft away from the player with the ball. The distance is measured from the landing foot of the player with the ball. If you are closer than 3ft, a penalty pass will be awarded.

Contact - This occurs when a player's actions interfere with an opponent's play, this can be accidental or deliberate. This includes: physical contact, using any part of the body to limit an opponent's ability to move freely (pushing, tripping or holding), placing a hand on the ball held by an opponent, removing it from an opponent's possession or pushing the ball in to an opponent when holding it.

Over a third - The ball cannot be thrown over a complete third without being touched or caught by a player. A free pass shall be taken from where the ball crossed the second line (i.e. where the ball shouldn't have been)

Replayed ball - A player can not; toss the ball in to the air and catch it again without it being touched by another player, catch a rebound from a shot on goal if it has not touched the post or another player, or pick it up again after losing control if it has not been touched by another player.

Offside - A player with or without the ball cannot move into an area of the court that is not designated for their position. This will result in a free pass to the other team.