



22

KNOWLEDGE ORGANIZER

NAME & FORM

YEAR 9
summer term



English Knowledge Organiser The Great Debate SUM1



Use of prompt cards	Use researched ideas.	Use of persuasive language techniques.	Body language and facial expression	Variation of tone in your voice.	Use of Standard English and complex vocabulary.
Helps create eye contact with the audience.	This will give you a convincing argument.	This will engage and hook your audience.	It will engage the audience and give you greater presence.	It can show emotion and your passion.	It shows you are well informed on the topic and confident.

What words can you use to impress your audience? Here are a few to get you started...

Devastating	Severity	Stereotyped	Violence	Witness	Disturbingly
Controversial	Crisis	Prejudiced	Abusive	Perpetual	Atrocious
Alarmingly	Stigma	Discriminatory	Substantial	Nonsensical	Deliberate

Which vocabulary can you use to move your speech along?

At the beginning: Firstly, primarily, I'd like to begin with, to start with...

To build your argument: Furthermore, on top of this, in addition to, moreover...As a result...

To bring in a counter argument: It could be argued... although some may disagree... understandably, sometimes... outrageously, some say...

To finish: In conclusion... Finally...To sum up...In summary...

The 5 S's.

Stride: Walk to the platform with energy and purpose.

Stand: Don't distract your audience in the first instance by moving around- get them to focus on you.

Smile: It relaxes you and helps you engage with the audience.

Speak: Be ready to start speaking- you are in control

Stay: When you have finished, look around, nod or smile and take applause before leaving the stage.

Spelling Bee Words:

Reaction- A response to something.

Controversial- Something easy to argue.

Informative-Provides facts/statistics.

Topical- Something of interest.

Underestimate- Think less of something.

Statistically- Based on a numerical fact.

Nationally- Around the nation

Political- relating to the government.

Argumentative- Likes to disagree.

Confrontation- A hostile or argumentative situation.



Persuasive techniques:

Tick these off as you use them.

- **Direct address**-using words like 'you' to the audience.
- **Alliteration**- repeating the same starting letters for effect.
- **Rhetorical Question**- a question that is not expected to be answered.
- **Facts and statistics**- e.g. 1 in 10 of us, 30 000 people...
- **Anecdote**- a personal story.
- **Expert opinion**- a quote from a doctor, professor etc.
- **Figurative language**- use metaphors, similes etc for effect.
- **Repetition**- repeating a word or phrase for effect.
- **Rule of 3**- Using three words in a list for effect.
- **Emotive language**- Words that create an emotive response.



Successful ways to open a speech...

Quote

Opening with a relevant quote can help set the tone for the rest of your speech. *E.g. "Yesterday is not ours to recover, but tomorrow is ours to win or lose."*

"What If" Scenario

Immediately drawing your audience into your speech works wonders. Asking a "what if" question invites the audience to follow your thought process. *E.g. What if you woke up every morning, cold, shivering on the street?*

"Imagine" Scenario

A similar method, but more relevant for sensational examples. It puts your audience members directly into the presentation by allowing each member to visualize an extraordinary scenario. *E.g. Imagine a world where everybody was treated equally...*

Question

Ask a rhetorical or literal question. *How would you feel if you had to walk ten miles every morning...?*

Statistic

Use a surprising, powerful, personalized statistic that will resonate with the audience to get your message across right away *e.g. 1 in 2 people get cancer...*

Powerful Statement/Phrase

A statement or phrase can catch the audience's attention by keeping them guessing as to what you're about to say next. *E.g. half of the world's coral reef has been destroyed in the last 30 years.*

How to structure the rest of your speech?

- 1)Begin by explaining the points you will make. *E.g. Today, I will be sharing with you...*
- 2)Begin your first argument, using a range of persuasive devices. *Firstly, can you believe that...*
- 3)Bring in a shocking fact for your audience to remember. *E.g. Shockingly, a startling 60 %..*
- 4)Introduce a counter argument. *E.g. while many may argue that...*
- 5)Bring in another argument. *Furthermore...*
- 6)Bring In one final argument. *As a result...*
- 7)Conclude by really emphasising your personal view. *E.g. in conclusion, the main thing I want you to remember is...*

English Knowledge Organiser

A Midsummer Night's Dream Sum 2



A03- Historical context/Shakespeare's ideas

Comedy genre:

- Shakespearean comedies end with a wedding, or several weddings, at the end of the play.
- Unlike the fatal conflicts of Shakespeare's tragedies, conflicts in his comedies are reconciled before serious harm can come to anyone

Chain of Being:

In Elizabethan society they believed in a social hierarchy known as 'The Chain of Being'. They believed that God ruled everything and was the most powerful, and that the King was chosen to rule by God. The higher you were up The Great Chain of Being, the more powerful you were.

Attitudes to women:

This hierarchy was copied in families. They believed that men had the right to rule from God. Women and children had to obey their male relatives. Women were generally viewed as men's property and not as individual human beings. Women were not even allowed to choose their spouse. It was common that this type of arrangement was made by their family, and husband. Determining factors were usually age, social status and wealth.

Fairies:

In traditional folklore, fairies were believed to be evil, larger than life spirits linked with the devil. Things that went wrong in the world were blamed on fairies. Shakespeare reinvented the idea of fairies by creating them as charming, but sometimes mischievous little sprites.

A reminder of the GCSE assessment objectives:

A01 (quotes!)

A02 (analysis of language, form and structure, make sure to mention techniques).

A03- Historical context, Shakespeare's ideas.

Suggested Sentence Stems:

Shakespeare explores the theme of _____ by...

For example/in his use of...

This suggests/shows...

The word/phrase suggest...

Shakespeare has done this to/at the time it was written...

A02- How can we improve our analysis?

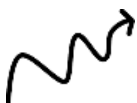
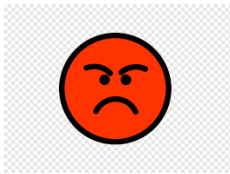
The writer...		Analytical verbs...		Evaluative...		Connectives...	
Skillfully	Gradually	Creates	Presents	Striking	Compelling	Therefore	Whereas
Energetically	Rapidly	Evokes	Illustrates	Shocking	Disturbing	Equally	Consequently
Bitterly	Swiftly	Implies	Reveals	Provocative	Subtle	Similarly	Contrastingly
Powerfully	Critically	Highlights	Portrays	Challenging	Crucial	Moreover	However
		Establishes	Develops	Damning	Empathetic	Despite this	Crucially

A02- WHAT'S THE DIFFERENCE BETWEEN LANGUAGE, FORM AND STRUCTURE?		
If we want to discuss: LANGUAGE Words, phrases, clauses, language techniques, symbolism, motifs, imagery, sound patterns, repetitions, contrasts and juxtapositions, figurative language, exaggeration, hyperbole	If we want to discuss: FORM Characterisation, settings, genre features/devices, narrative view and voice, atmosphere, mood, tensions	If we want to comment on: STRUCTURE Shifts, changes, developments, chronology, cause/ effect, foreshadowing, flashback,

A01- Key Quotes

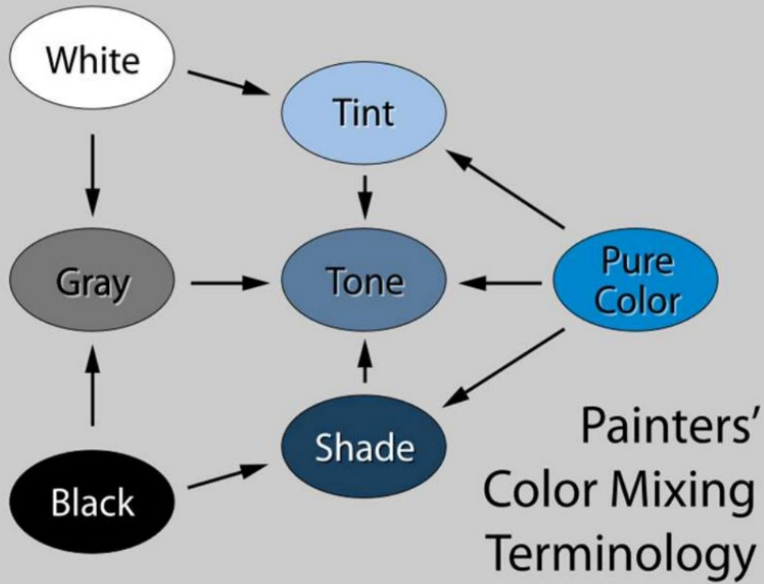
The Great Chain of Being



Order		Disorder	
e.g. ‘If we shadows have offended, Think but this, and all is mended’.		e.g. ‘the course of true love never did run smooth’.	
Anger		Love	
“Though she be but little, she is fierce!		“Love looks not with the eyes, but with the mind, And therefore is wing'd Cupid painted blind.”	

Key Words:

- Hierarchy- An order of something, often social. E.g. men were higher up the hierarchy than women.
- Patriarchal- Men in power, ruling over women/others.
- Hyperbole- Exaggeration.
- Dramatic irony- A structural technique, where the audience know something that actors on stage do not.



Jason Scarpace- pattern work



KEY WORDS – test yourself! (definitions on the next page)

Tint- Tone- Shade- Sponging- Flat wash- Gradient- Pattern- Accuracy- Wax resist- Mandala- Fineliner- Watercolour- Detail.

Watercolour Year 9 Summer term

Watercolour techniques

Sponging



Colour to light gradient



Colour to colour gradient



Flat wash



Watercolour and fineliner



Wax resist



Mandala



KEY WORDS AND MEANINGS:

Flat wash	Brushing successive strokes of paint on a wet or dry surface to create an even layer of colour.
Fine liner	Pens with plastic or fine fibre needle-point tips that generally use water-based ink but sometimes use oil-based.
Wax resist	Placing wax on your paper, painting over the wax and the wax resists the watercolour leaving the white of the paper exposed.
Gradient	A gradual blending from one colour to another colour or from light to dark.
Dry brush	A painting technique in which a brush having a small quantity of pigment or medium is dragged across a surface.
Pattern	A design in which lines, shapes, forms or colours are repeated.
Accuracy	Degree of closeness of measurement. It means precision or correctness or exactness to the source image or object.
Detail	A distinctive feature of an object or scene which can be seen most clearly close up.
Bold	A very bright and noticeable colour or element of the work.
Tone	The relative lightness or darkness of a colour, or the range between black and white.

Colour code: **BLUE= Tier 3 words** **ORANGE= Tier 2 words**

Look out for colour coding during lessons!



Drama Knowledge Organiser



Plot

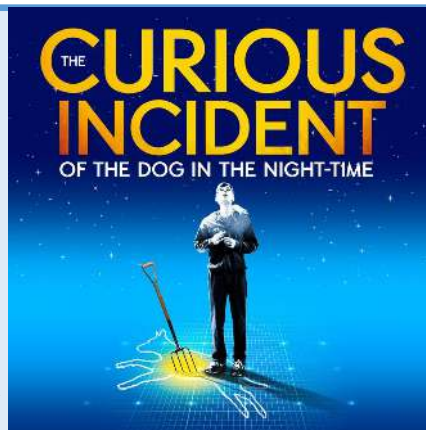
The Curious Incident of the Dog in the Night-Time is an adaptation by Simon Stephens of the original novel by Mark Haddon.

The Curious Incident of the Dog in the Night-Time follows the story of Christopher Boone, a 15 year old, who is exceptional at Maths but finds people confusing.

The play opens with Christopher discovering a dead dog in his neighbour, Mrs Shears', garden. Despite his father, Ed, warning Christopher not to get involved, Christopher decides to investigate the death of the dog. In doing so he discovers that his mother is not dead as his father had told him, but alive and well, living in London.

He also discovers that it was his father who killed the dog. Christopher feels that his father is a murderer, who he cannot trust. He can no longer live with him and so he bravely travels to London to find his mother. Christopher has difficulty settling into his new life in London and returns to Swindon to take his A-level Maths exam.

The play ends with him passing the exam and the realisation that he can do anything he puts his mind to.



CHARACTERS

Christopher Boone	The protagonist. A 15-year-old boy who is very good at maths but finds people confusing.
Ed Boone	Christopher's Dad. He cares about his son but is very hot-headed and stubborn.
Judy Boone	Christopher's Mum. Left due to not being able to handle his odd behaviour. Has a fun and romantic view of life.
Siobhan	Christopher's teacher. She is calm, patient and encouraging. She gives Christopher advice on what he should do.
Rodger Shears	Christopher's Mum's boyfriend. He is not understanding towards Christopher's needs and is often sarcastic
Mrs Shears	Rodger's wife. Helped Ed and Christopher. Wellington's owner.
Mrs Alexander	An elderly woman who lives on Christopher's street. She is kind and welcoming, but could also be seen as a gossip.

Vocal skills

Pitch
Pace
Pause
Accent
Emphasis
Intonation
Tone

Physical Skills

Posture
Eye contact and its withdrawal
Gesture
Gait
Interaction
Body Language
Mannerisms

Constantin Stanislavski
1863 – 1938



'The actor must use his imagination to be able to answer all questions (when, where, why, how).'

Believed that the audience should emotionally connect with the characters.

Actors should use their own experience to make their characters as believable as possible.

Terminology and techniques:

- The fourth wall
- Emotional memory
- The magic 'if'
- Sense memory
- Objectives
- Given circumstances
- Subtext
- Method of physical actions

Naturalism

Bertolt Brecht
1898 – 1956



'Art is not a mirror to reflect reality, but a hammer with which to shape it.'

Believed that theatre should be used to spread a message and comment on society.

The audience should always be aware they are watching a play and constantly questioning what they see.

Terminology and techniques:

- Breaking the fourth wall
- Alienation (Verfremdungseffekt)
- Gestus
- Use of placards
- Narration
- Multi-role
- Minimal set/costume/props
- Masks

Epic theatre

Frantic Assembly
1994 – Present

**FRANTIC
ASSEMBLY**

'We began with little more than a fierce work ethic and a desire to do something different and to do it differently.'

World-renowned theatre company who use physical theatre to devise performance.

Wanted to create non-realistic pieces of theatre through the use of movement and music.

Terminology and techniques:

- Chair duet
- Hymn hands
- Lifts
- Walk the grid
- Mirroring
- Round-By-Through

Physical theatre

To find out more about Naturalism, scan the QR code:



To find out more about Epic Theatre, scan the QR code:



To find out more about Physical Theatre, scan the QR code:





Music Knowledge Organiser



Year 9 Summer Term

The invention of the movie soundtrack changed the role of music in film. In the 1930s the role of the *film composer* began to emerge. Music was needed for the credits and for parts of the film with no dialogue, particularly the really dramatic sections. Many have REALLY good themes (leitmotifs) for their characters e.g. James Bond, Jaws, Superman.

Composers in big budget films use a full symphony orchestra. In modern times, films that do not have the large amounts of money can now employ one person using sampled sounds and a keyboard to re-create the sounds of a full orchestra.

KEY WORDS – test yourself! (definitions on the next page)

INTERVAL

PEDAL NOTE

OMINOUS ENDING

FANFARE

TRIPLETS

LEITMOTIF

RITENUTO

STACCATO

DISSONANCE

PICCOLO

CONTRAST

OSTINATO

Features of Movie Music:

- Lots of contrast to suit the drama – tempo changes, pitch changes, dynamics changes
- Syncopated rhythms
- Use of Symphony orchestra
- Leitmotifs (character themes)
- Cultural references in the music – choice of instruments and rhythms suitable to the location
- ‘Mickey Mousing’
- Interesting choice of tonality e.g. major = happy, minor = sad/mysterious, atonal = horror
- Diabetic music (can be heard by characters) and background music

John Williams is an American composer, conductor and pianist and has won 25 Grammy Awards! He is regarded as one of the most influential film composers. His work has influenced other film composers, as well as contemporary classical and popular music. Some of his most well-known films include: Star Wars, Jaws, Close Encounters of the Third Kind, Harry Potter, Jurassic Park and E.T.

Hans Florian Zimmer is a German film **score composer and record producer**. His works are notable for integrating electronic music sounds with traditional orchestral arrangements. Since the 1980s, Zimmer has composed music for over 150 films. His works include The Lion King, Dune, Pirates of the Caribbean, Gladiator. His films have grossed over 28 BILLION dollars at the box office world –wide!

Quincey Jones’ legendary career spans over six decades in the entertainment industry. Jones's highlight-laden career includes producing everything from hits for Frank Sinatra and Count Basie to piloting *Off the Wall*, *Thriller*, and *Bad* for Michael Jackson. His work for *The Color Purple* was nominated for Best Original Score and Best Original Song in Steven Spielberg’s first movie without composer John Williams.

Key Score: *In the Heat of the Night*, *The Italian Job*, *The Colour Purple*

What is Mickey Mousing?

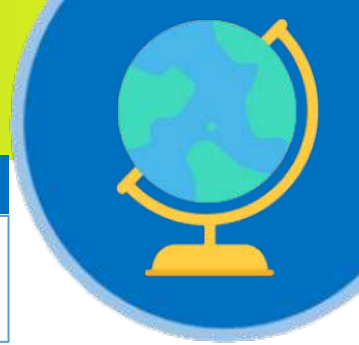


A film technique that matches the music with the actions on screen. Walt Disney films often used this technique where the music almost completely works to mimic the animated motions of the characters.

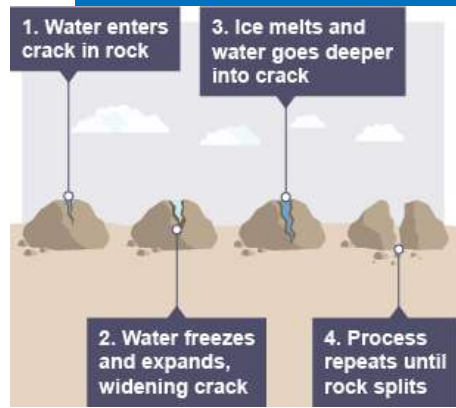
KEY WORDS AND MEANINGS: Tier two words in BLUE, Tier three words in ORANGE	
Interval	The distance between two notes e.g. a 4 th , 5 th , 7 th
Pedal (note)	A long, sustained note OR a repeated note in the bass line
Ominous ending	A tense and worrying ending to the piece created by using a long, low pitched note on cello
Fanfare	A fancy, brass ‘announcement’ that something or someone important has arrived e.g. The Queen
Triplets	Three notes that can be played in the space of two. Sounds like ‘sau-sa-ges’
Contrast	Opposites e.g. Fast and Slow, Loud and Quiet, High and Low
Leitmotif	A theme for a character, place or item e.g. Luke Skywalker or the Death Star
Ritenuato	To gradually slow down
Staccato	To play the notes in a short and detached way
Dissonance	Clashing harmonies
Piccolo	A small flute – very high in pitch
Ostinato	Repetition – this could be a rhythm or a melody



Geography Knowledge Organiser - Coasts

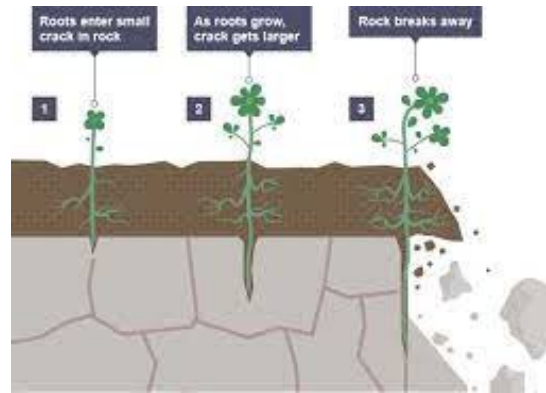


Weathering



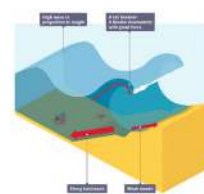
Freeze thaw weathering:

- Water enters cracks in the rock.
- When temperatures drop, the water freezes and expands causing the crack to widen.
- The ice melts and water makes its way deeper into the cracks.
- The process repeats itself until the rock splits entirely.



Biological weathering:

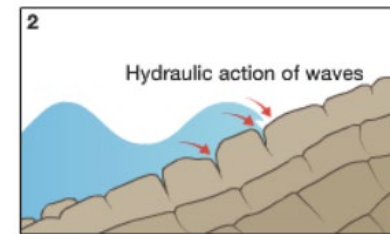
- Plant roots can get into small cracks in the rock.
- As the roots grow, the cracks become larger.
- This causes small pieces of rock to break away.



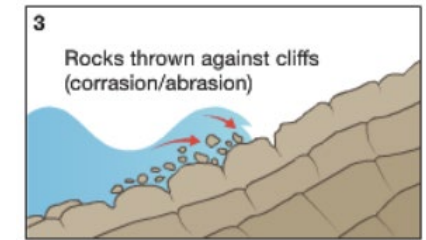
Erosion

Erosion – is the wearing away of rock along the coastline.
Destructive waves are responsible for the erosion (breaking down) of the coastline.

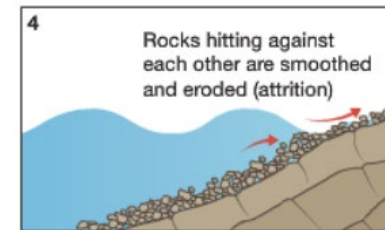
Hydraulic action - this is the sheer power of the waves as they smash against the cliff. Air becomes trapped in the cracks in the rock and causes the rock to break apart.



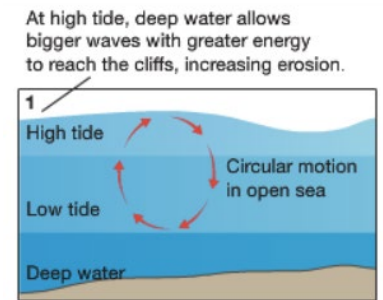
Abrasion - this is when pebbles grind along a rock platform, much like sandpaper. Over time the rock becomes smooth



Attrition - this is when rocks that the sea is carrying knock against each other. They break apart to become smaller and more rounded.



Solution - this is when sea water dissolves certain types of rocks. In the UK, chalk and limestone cliffs are prone to this type of erosion.



Mass Movement

Another way material can be moved on the coastline is through **mass movement**. Mass movement is the downhill movement of sediment that moves because of gravity.

Find out more about Mass Movement

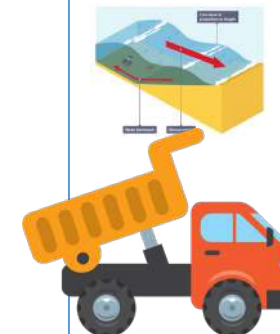


Deposition is **when material that is being transported is dropped by constructive waves**. It happens because waves have less energy. Deposition happens when the swash is stronger than the backwash and is associated with constructive waves

Deposition

Deposition is likely to occur when:

- waves enter an area of shallow water;
- waves enter a sheltered area, eg a cove or bay;
- there is little wind;
- a river or estuary flows into the sea reducing wave energy;
- there is a good supply of material and the amount of material being transported is greater than the wave energy can transport.



Test yourself – complete the Blitesize quiz



Geography Knowledge Organiser – Coasts

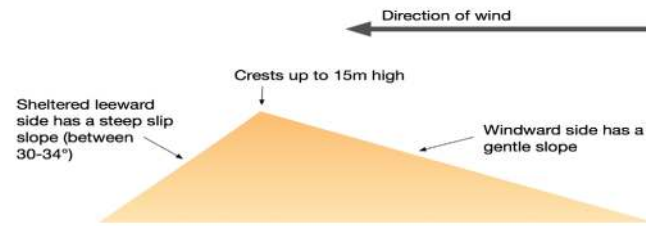


Sand Dunes

The conditions required for sand dunes to form include:

- a large supply of sand
- a large flat beach
- time for sand to dry, so a large tidal range is needed
- an onshore wind (wind blowing from the sea to the land) for sand to be moved to the back of the beach
- an obstacle for the dune to form against e.g pebble or driftwood

Characteristics of sand dunes



Spits

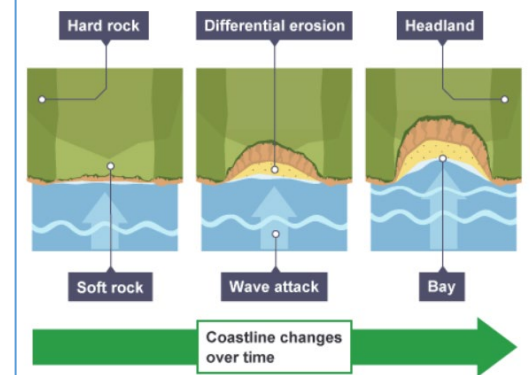
A **spit** is an extended stretch of beach material that projects out to sea and is joined to the mainland at the other end.

- Sand dunes are created around obstacles on the beach eg a dead animal. The sea brings sediment to the beach and then the wind redistributes that sediment.
- When the wind encounters the beach obstacles velocity falls and sediment is **deposited** – this creates the **embryo dune**. Over time, tough plants known as **pioneers** such as Marram grass take root on the dune, their root systems helping to stabilise the sand.

Headlands and Bays

Headlands and bays form at a **discordant coastline** where there are layers of hard and soft rock.

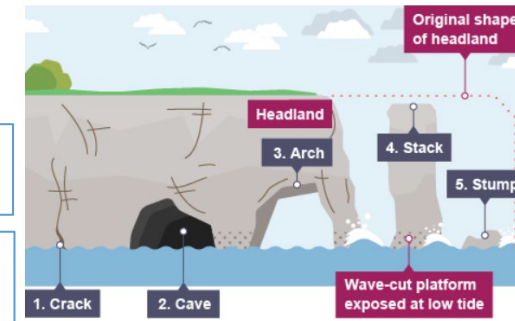
- The bands of soft rock, such as sand and clay, erode more quickly than the more resistant rock, such as chalk.
- The section of land jutting out into sea is called a headland.
- The area where the soft rock has eroded away is called a bay.
- Sand is deposited in the sheltered bay to form beaches.



Caves, Arches, Stacks and Stumps

Caves occur when waves force (**hydraulic action**) their way into cracks in the cliff face.

If the cave is formed in a headland, it may eventually break through to the other side forming an **arch**.



The arch will gradually become bigger until it can no longer support the top of the arch. When the arch **collapses**, it leaves the headland on one side and a **stack** (a tall column of rock) on the other.

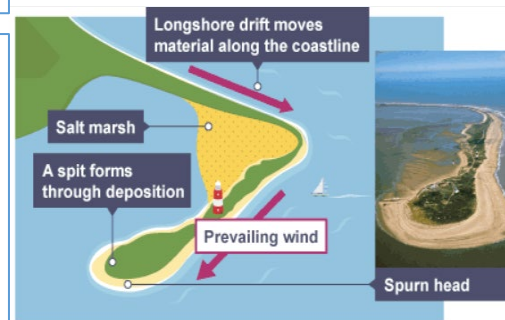
The stack will be attacked at the base in the same way that a wave-cut notch is formed. This weakens the structure and it will eventually **collapse** to form a **stump**.

The cliffs around Old Harry Rocks are made of chalk. Wave refraction causes **erosion of the headland** and deposition in the bays either side.

Old Harry

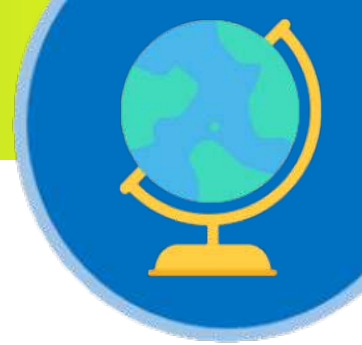


1. **Longshore drift** moves material along the coastline.
2. A **spit** forms when the material is deposited.
3. Over time, the spit grows and develops a **hook** if wind direction changes further out.
4. Waves cannot get past a spit, which creates a sheltered area where silt is deposited and mud flats or **salt marshes** form.





Geography Knowledge Organiser – Coasts



Coastal Management

Hard engineering involved building artificial, man made structures which try to control natural processes and reduce erosion.

Sea Walls – Are concrete walls that are placed at the foot of a cliff to prevent erosion. They are curved to reflect the wave energy back to sea.

- ☺ Effective at protecting the base of the cliff
- ☺ Sea walls can be used as promenades so people can walk along them
- ☹ Expensive – approximately £2,000 per metre
- ☹ Waves are still powerful and can break down and erode the sea wall



Soft engineering does not involve building artificial structures, but takes a more sustainable approach to managing erosion.



Beach nourishment – Sand is pumped onto an existing beach to build it up.

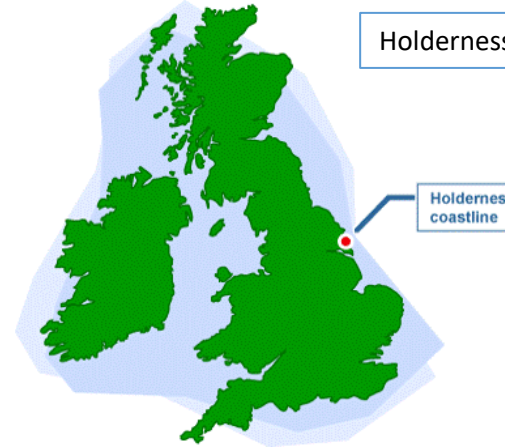
- ☺ Blends in with the existing beach
- ☺ Larger beaches appeal to tourists
- ☹ Needs to be constantly replaced
- ☹ The sand has to be brought in from elsewhere

Managed Retreat - Do nothing!

Managed retreat is where the council decide to not protect an area. They council will let the section of coastline erode and pay compensation to the residents that live in the area.

Holderness Coast

Holderness coast is in the north east of England.



What causes the Holderness coastline to retreat?

The problem is caused by:

- strong prevailing winds creating **longshore drift** that moves material south along the coastline
- the cliffs which are made of a soft boulder clay, and will therefore **erode** quickly, especially when saturated.

The village of Mappleton, perched on a cliff top on the Holderness coast, has approximately 50 properties. Due to the erosion of the cliffs, the village is under threat.

In 1991, the decision was taken to **protect** Mappleton. A coastal management scheme costing £2 million was introduced involving two types of hard engineering - placing rock armour along the base of the cliff and building two rock groynes.

How far do you agree?

- Small
- Medium
- Large

Mappleton: Rock groynes to protect Mappleton and B1242. Rock groynes trap material on the beach **(cost £2 million)**

Fastest eroding coastline in Europe

NE of the UK

Made of boulder clay which erodes quickly when saturated.

To what extent has coastal management protected Holderness coast? (9 + 3 SPaG)

Where the land meets the sea

Hornsea: Timber groynes have been used to trap sediment and build the beach.



61km from North – south



Geography Knowledge Organiser – Urban Regeneration



Urban regeneration is an approach to city planning to repair the social and economic problems of an urban area, improving the physical and environmental aspects of the city, as well as the buildings.



- Salford Quays
- Manchester UK
- Old dock areas to the south west of the city centre.

Why was urban regeneration needed in Salford Quays?

- It was a heavily industrialised area of Manchester.
- The docks and Manchester shipping canal were here
- importing and exporting products like cotton
- Ships became too big for the canal, so the docks closed in 1982
- Over 30,000 jobs were lost
- The area became derelict and the water became contaminated and dirty

Key Question:

- What challenges arise from urban planning in LICs?
- Do the challenges of urban regeneration in Rio De Janeiro outweigh the opportunities?

Location: Rio De Janeiro, Brazil

Background Info: Rio De Janeiro is the second largest city in Brazil with a population of 13.6 million people. Rio is a divided city, 60% of the population live in the middle and upper class regions. 40% of the population lives in poverty and lives within the 600 favela settlements around the city. The favelas raise many issues through social, economic and environmental challenges.



Some of Rio's answers to its problems include housing developments, Pacifying Police Units, a bike-share program and Rapid Bus transit.

Passivhaus : making sure buildings are designed in a way that the material does not leak heat and is the most energy efficient.

USE A CASE STUDY OF A MAJOR UK CITY TO ASSESS the extent to which URBAN CHANGE HAS CREATED OPPORTUNITIES AND CHALLENGES FOR THE CITY. (9)

1. How far do you agree?
2. Did it help the city?



Positives ☺	Negatives ☹
• Businesses created employment • Residential – houses, flats close to employment of the city centre • Multiplier effect of tourists visiting the area • Environmental improvements	• The new jobs needed different qualifications, so didn't replace the old jobs of the workers in the docks • House prices can increase as the area is improved • More people from tourism – traffic, litter, crowding

An architect is someone who designs buildings and built environments.





History Knowledge Organiser:

Holocaust and Genocide

Timeline: Persecution of the Jewish community

1933

- The **SA** organised a **boycott** of Jewish shops and businesses.
- Books by Jewish authors were publicly burnt.
- Jewish civil servants, lawyers and teachers were sacked, and Jewish doctors and dentists could not treat **Aryans**.
- Science lessons about race were introduced which **taught that Jews were subhuman**.

1934

- Jewish shops were marked with a **yellow star**.
- Jews had to sit on separate seats on buses and trains. Many councils banned them from public spaces.

1935

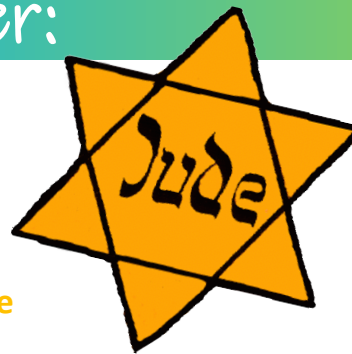
- The **Nuremberg Laws** stripped Jews of German citizenship, outlawed marriage and sexual relations between Jews and Germans, and removed all the civil and political rights of the Jews. These laws were to be the foundation for much of the extreme persecution which took place later.

1938

- Jews were ordered to register all wealth and property.
- Jews were forced to change their first names: males would be known as Israel, females as Sarah.
- Kristallnacht** - 9 November (The Night of Broken Glass). The **SS** organised attacks on Jewish homes, businesses and synagogues in retaliation for the assassination of the German ambassador to France by a Jew. During Kristallnacht, 400 synagogues and 7,500 shops were destroyed. Jews were then made to clear up the destruction on their hands and knees and pay a fine of one billion marks to the government. The remaining Jewish property was then confiscated.

1939

- The Nazis, who had been encouraging Jews to emigrate from 1933 onwards, now started "forced" emigration.



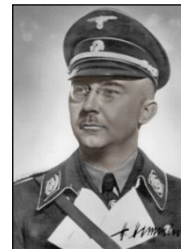
Scan the QR code to watch a short clip on Jewish persecution



Holocaust – Who was to blame?



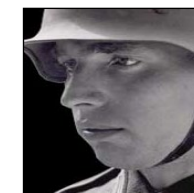
Adolf Hitler, in his writings and speeches talked of destroying the Jewish race and passed laws against Jewish people. His anti-Semitic beliefs and policies were implemented soon after the Nazis came to power.



Heinrich Himmler was the Head of the SS. He was in overall charge of the 'Final Solution' and believed that he was carrying out Hitler's instructions to exterminate the Jews. He made sure news about camps were secret; and had propaganda films made showing how well Jews were being treated.



German people of all jobs and backgrounds saw the Jews were being treated differently and did not protest. Many had even stopped buying goods at Jewish stores. Only a small number of German people stood up for the Jews.



Otto Wolff was a SS soldier at Treblinka. As an SS guard, one of his duties was to supervise and operate the gas chambers. After the war, he said at his trial: "*I didn't ask to be sent to Treblinka, I had no choice. I was just doing my job.*"

Remember many other persecutors, collaborators & bystanders

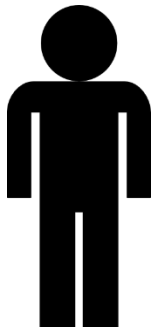


Anne Frank was a German girl and Jewish victim of the Holocaust who is famous for keeping a diary of her experiences. Anne and her family went into hiding for two years to avoid Nazi persecution



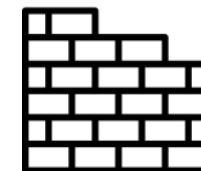
All over the world, Auschwitz has become a symbol of terror, genocide, and the Holocaust. The Germans isolated all the camps and sub-camps from the outside world and surrounded them with barbed wire fencing. All contact with the outside world was forbidden.

Hitler's hate list



- Jewish people
- Gypsies (Sinti and Roma)
- Disabled people
- Homosexuals
- The 'Rhineland Bastards' (African/German heritage)
- Jehovah Witnesses
- THE ASOCIALS: anti-Nazis, communists, trade unionists, the homeless, prostitutes, alcoholics

Hitler played on fears that one day Germans would be outnumbered by inferior peoples



Ghettos – Jewish people were rounded up and put into walled off areas of cities. The conditions here were poor. Houses were cramped with multiple families, there was little sanitation and food. Many died of starvation and disease spread easily. It was from these Ghettos that Jewish people were taken to the concentration camps. The Warsaw Ghetto is an example.

Key words:

Holocaust - the mass murder of Jewish people under the German Nazi regime during the period 1941–5. More than 6 million European Jews, as well as members of other persecuted groups such as Romani, gay people, and disabled people, were murdered at concentration camps such as Auschwitz.

Genocide – The deliberate killing of a large number of people from a particular nation or ethnic group with the aim of destroying that nation or group.

During the **Rwandan genocide** of 1994, members of the Hutu ethnic majority in the east-central African nation of Rwanda murdered as many as 800,000 people, mostly of the Tutsi minority. Started by Hutu nationalists in the capital of Kigali, the genocide spread throughout the country with shocking speed and brutality, as ordinary citizens were encouraged to take up arms against their neighbours. By the time the Tutsi-led Rwandese Patriotic Front gained control of the country through a military offensive in early July, hundreds of thousands of Rwandans were dead and 2 million refugees fled Rwanda.

The **Cambodian Genocide** was the murder of millions of Cambodians by the Khmer Rouge. The Khmer Rouge were led by Pol Pot and held radical totalitarian beliefs. They wanted to create a classless, rural, agricultural society where personal property, currency, religion and individuality did not exist. People associated in any significant way with the previous government, religion, or education were targeted for persecution, imprisonment, torture and murder. Some Cambodians were also exploited as forced labourers by the regime and died as a result of over-work and malnutrition. Ineffective rulers and their economic mismanagement caused significant shortages of food and medicine. Hundreds of thousands of Cambodians began to die from hunger caused by the famine and treatable diseases such as malaria .





History Knowledge Organiser:

Civil Rights Movement

Key words:

Civil Rights Act – 1964 law passed in America that made segregation illegal.

Institutionalised Racism – a form of racism that is embedded within organisations or society.



The roots of the Notting Hill Riots are found in the migration of people from the Caribbean to London right after World War II. With the population influx, Notting Hill became a more international district. Claudia Jones was a key figure.



The Bristol Bus Boycott of 1963 came from the refusal of the Bristol Omnibus Company to employ black or Asian bus crews in the city of Bristol, England.

In British cities, there was widespread racial discrimination in housing and employment at that time. The boycott was led by Paul Stephenson. The boycott of the company's buses by Bristolians lasted for four months until the company backed down and overturned the colour rule.



Martin Luther King

- **Dignified, intelligent, peaceful:** helped win support not only of black Americans but also many white Americans
- Made it clear that the protestors were the victims of police brutality
- Outrage at the use of Water Cannons on protestors during the Birmingham Campaign in 1963
- **Peaceful protests** - without this message, the protests could have spilled into violence, which some white Americans could have twisted to support their views that African-Americans were brutal thugs who did not deserve the same rights as they did not follow the law
- **1964 The Civil Rights Act desegregated many states and improved the lives of millions of black Americans. MLK played a key role in getting this act passed.**



Scan the QR code to learn more about Malcom X

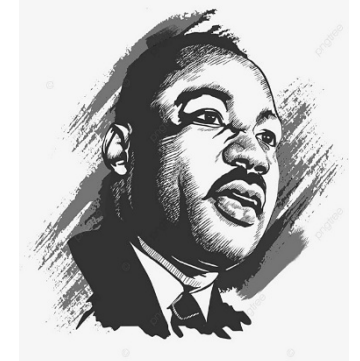


Malcolm X

- Believed peaceful protest was not bringing change fast enough and violence was needed in some cases
- Used his speeches to inspire people, more to remind people that they have a voice and should use it.
- Inspired young African Americans who were unhappy with their treatment and felt that the civil rights movement was not improving their lives
- Key role in the development of the Black Power Movement and the idea that being black was something to be proud of rather than to be made to feel ashamed of
- Gained publicity for black civil rights campaigns



Scan the QR code to watch this clip to learn more about MLKs March on Washington



Emmett Till

- **14 year old African American boy from the Northern states of America.**
- **In 1955 he was murdered by two white men for allegedly flirting with a white woman in a southern state of America where segregation was still practiced alongside Jim Crow laws.**
- He had been beaten and shot
- His mother requested an open casket as his funeral to show the barbarity and severity of his murder.
- **The American people were horrified by this case and Emmett Till's murder is seen as the catalyst for the Civil Rights Movement**



Scan the QR code to learn more about Emmett Till





Key concepts / words

Prejudice – Pre judging someone based on who they are not their character. Eg. race, gender, religion or sexuality

Discrimination – Treating people differently based on a prejudice

Personal Conviction – When a person is convinced there needs to be social change. They act upon it in a peaceful way

Relative poverty - A standard of poverty measured in relation to the standards of society in which a person lives

Religious expression – the ways people express their faith: *clothing, symbols, evangelism, worship.*

Evangelism- speaking about Christian faith with the aim of converting

Censorship - Limiting access to materials considered offensive or a threat. For example, a Muslim would want images of the prophet Muhammad or Allah censored.

Extremism- expressing your faith in a violent way which impacts people's human rights. The opposite of personal conviction



Prejudice and discrimination are unacceptable in Christianity.

They go against religious teachings of equality. '*God made man in His image*'.

Jesus didn't discrimination in the **Parable of the Good Samaritan** and taught '*Love your neighbour*'. The Bible also teaches '*There is neither Greek or Jew, slave or free, male or female, all one in Jesus*'. The **Golden Rule** states to treat others as you would want to be treated.

In Islam all people are equal as they are **all Allah's creation**.

The teaching '*All equal as the teeth of a comb*' promotes equality.

Personal Conviction -Martin Luther King

When making **social change** actions may conflict with the law or authority. **Martin Luther King** had a personal conviction for racial equality. He led peaceful protests, used speeches, sit ins, bus boycotts to fight against injustice. He was a Christian Church minister so was putting into practices the Bible's teachings on equality of: '*Made in God's image*' and '*Love your neighbour*'.



Personal Conviction - Malala Yousafzai

She went against the authority of the **Taliban in Pakistan** who were not allowing girls an education. She peacefully protested by writing a blog which went viral and lead protests to ride the bus to school even though girls were banned. She did this because Islam teaches '*All equal as the teeth of a comb*' and we are all Allah's creation so should therefore be treated equally and are entitled to our human rights. Also the first word of the Qur'an is 'Read!' and so she knew girls needed to have education to do as Allah commanded. She was shot three times by the Taliban while on the school bus.

Wealth and Charity

Christians believe people should use their wealth to support others and they will be **rewarded in the afterlife**. The Bible teaches '*It is easier for a camel to pass through the eye of a needle than for a rich man to get into heaven*'.

Christians also believe they should support those in need and charities as Jesus taught '*love your neighbour*'. **Parable of the Good Samaritan** teaches us to help those in need.

Christian Aid aim to end poverty and injustice.

Muslims believe **wealth is gift from Allah** and should be used correctly. You will be judged on how you have used your wealth. Muslims are expected to give **Zakah**. This is the third pillar of Islam and it is a Muslims duty to give 2.5% of wealth to charity to help those in need. They follow the example of the **Prophet Muhammad**.

Islamic relief is an example of an Islamic charity.

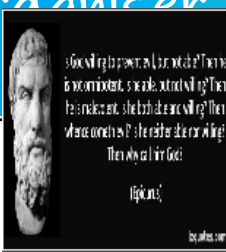


Key concepts / words

- Moral Evil**- suffering caused by humans
- Natural Evil**- suffering caused by natural disasters
- Epistemic Distance**- God purposely distances Himself from humanity to test our faith in Him.
- Deterrent**- a tough punishment like prison to prevent people committing a crime
- Reform** – the act of changing someone from bad to good
- Retribution**- punishing someone as an act of revenge
- Remorse** – feeling guilty and saying sorry after committing a crime
- Capital Punishment**- the death penalty for serious crimes such as murder
- Prison Chaplain** – someone from a faith who goes into prisons to council prisoners and get them to feel remorse or convert

Muslim reasons why God allows suffering:	This term means ‘ <u>pre-destination</u> ’ or fate and is the Muslim belief that for Allah to be all powerful, he has a plan for every life. Allah is testing each individual to see if they will make the right choices and follow his path and submit to his will. <i>When they don’t follow Allah this is when suffering and evil take place.</i>
Al-qadr	Muslims also believe in the devil or ‘Shaytan’ in the same way as Christians do. <u>Shaytan</u> want to tempt humans into not following Allah’s path.
Shaytan	

- Christian Quotes on forgiveness:**
- ‘*Turn the other cheek.*’
 - ‘*Blessed are those who show mercy for they will be shown mercy*’
 - ‘*Father forgive them as they know not what they do*’ (*Jesus whilst being crucified*)
 - ‘*Forgive not 7 times but 77*’



- Capital Punishment:**
- ✓ **Conservative Christians** follow quotes such as ‘*life for a life*’ to justify death penalty
 - X **Liberal Christians** follow ‘*turn the other cheek*’ and ‘*love your neighbour*’ to suggest reform and remorse in prison not death
 - ✓ **Islam**- Qur’an supports death penalty in *cases of murder* and if *Allah has been attacked*.

Key question: What is the problem of believing in God when there is suffering?

If God is **OMNIPOTENT** (powerful) then why doesn’t he stop it?
If God is **OMNISCIENT** (all knowing) then he must know about it and when it’s going to happen but still does nothing?
If God is **BENEVOLENT** (all good/loving) then how can he want his creation to suffer, including innocents?
If God is the **CREATOR** then why did he make a creation, which kills his people through natural disasters? (natural evil) . Therefore, does God exist?

Christian Responses to why God allows suffering?

The Original Sin	Adam and Eve were the first humans. They disobeyed God when they ate the fruit of the forbidden tree. They were tempted by the snake, who represents the devil. It is called the ‘ Original ’ Sin because it was the first time humans disobeyed God with our free will and because Christians believe we have inherited this tendency to sin .
The devil	The devil was an angel, who also disobeyed God . God loves all his creatures, including angels and therefore did not want to destroy him. Instead, he cast him out of Heaven to live in the underworld, known as <u>Hell</u> . To this day, the devil or ‘ <u>fallen</u> ’ angel tries to annoy God by tempting humans.
The Soul-making theory	The <u>philosopher Hick</u> created the ‘Soul-making’ theory. He argues that suffering is allowed by God to develop our souls so that we can reach perfection as God intended before the Original Sin. Suffering allows us to develop characteristics such as: courage, kindness, compassion and love . Without these qualities our souls would remain imperfect and we would not be allowed to reach Heaven. Furthermore, he argued that God places himself at an <u>epistemic distance</u> in order to test our faith even more.
Free Will	For God to be truly loving he had to give humans ‘Free Will’ because otherwise we would be like puppets or robots and God would be this slave driver over our actions. Instead, God wants to give us freedom. But, with freedom comes great responsibility for our actions and God wants us to learn from our mistakes. Unfortunately as well, with such freedom means sometimes humans make terrible mistakes and cause great suffering through moral evil .

Maths Knowledge Organiser

INDICES AND ROOTS



Key Concepts

$$a^m \times a^n = a^{m+n}$$

$$a^m \div a^n = a^{m-n}$$

$$(a^m)^n = a^{mn}$$

$$a^{\frac{1}{n}} = \sqrt[n]{a}$$

$$a^{-m} = \frac{1}{a^m}$$

Examples

Simplify each of the following:

$$1) a^6 \times a^4 = a^{6+4} \\ = a^{10}$$

$$2) a^6 \div a^4 = a^{6-4} \\ = a^2$$

$$3) (a^6)^4 = a^{6 \times 4} \\ = a^{24}$$

$$4) (3a^4)^3 = 3^3 a^{4 \times 3} \\ = 27a^{12}$$

$$5) \frac{5^2 \times 5^6}{5^4} = \frac{5^8}{5^4} \\ = 5^{8-4}$$

$$= 5^4$$

$$6) a^{\frac{1}{2}} = \sqrt{a}$$

$$7) 9^{\frac{1}{2}} = \sqrt{9}$$

$$= 3 \text{ or } -3$$

$$8) 2^{-3} = \frac{1}{2^3} = \frac{1}{8}$$

Y9

Key Words

Powers

Roots

Indices

Reciprocal

Simplify:

$$1) a^3 \times a^2$$

$$2) b^4 \times b$$

$$3) d^{-5} \times d^{-1}$$

$$4) m^6 \div m^2$$

$$5) n^4 \div n^4$$

$$6) \frac{8^4 \times 8^5}{8^6}$$

$$7) \frac{4^9 \times 4}{4^3}$$

$$8) (3^2)^5$$

$$9) 81^{\frac{1}{2}}$$

$$10) 5^{-2}$$



Maths Knowledge Organiser

DISTANCE-TIME GRAPHS



Key Concepts

A **distance-time** graph, plots time against the distance away from a starting point.

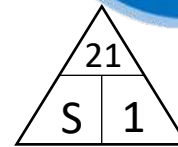
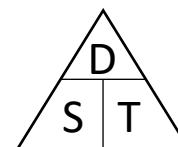
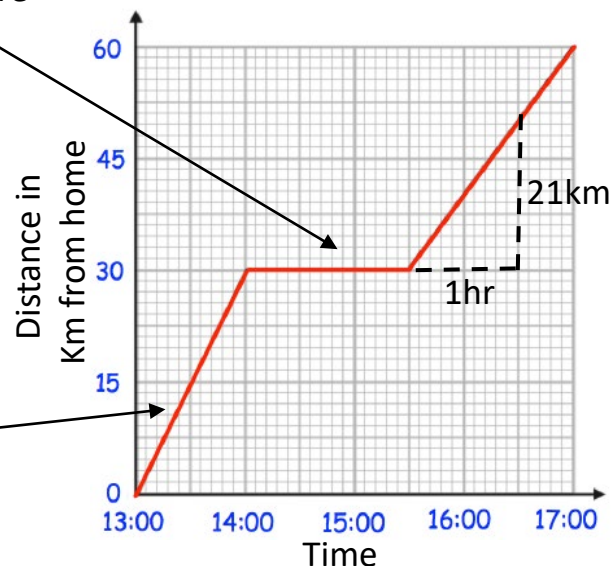
Speed can be calculated from these graphs by finding the gradient of the graph.

Horizontal lines are sections where the object is stationary.

Examples

Horizontal sections are where the object is stationary

Diagonal lines show the object moving away from home or moving closer to home



$$\text{Speed} = \frac{\text{distance}}{\text{time}}$$

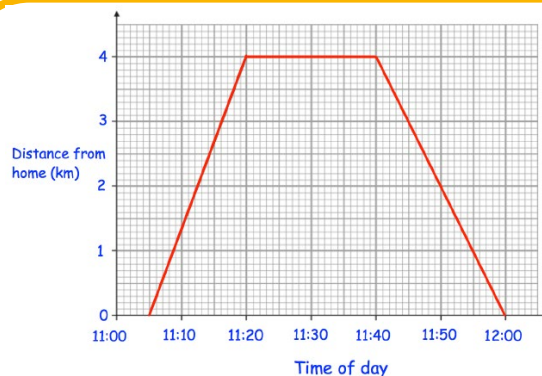
$$\text{Speed} = \frac{21}{1}$$

$$\text{Speed} = 21\text{km/h}$$

Y9

Key Words

Distance
Time
Speed
Gradient
Stationary



A distance-time graph shows the journey of someone from home to the shop and back again.

- 1) How long were they at the shop for?
- 2) How far away from home is the shop?
- 3) How far did they travel in total?
- 4) What speed did they travel on the way to the shop in km/h?

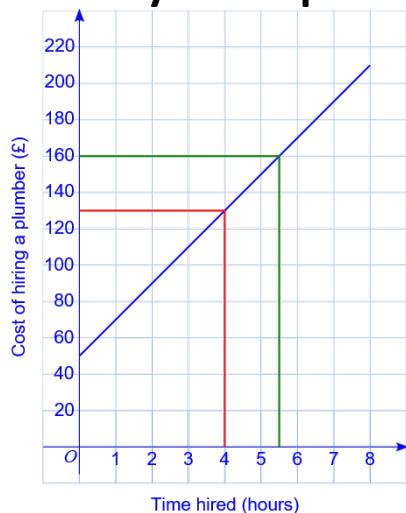


Maths Knowledge Organiser



CONVERSION GRAPH

Key Concept



Gradient – The extra cost incurred for every extra hour.
y-intercept – The minimum payment to the plumber.

Key Words

Conversion graph: A graph which converts between two variables.

Intercept: Where two graphs cross.

y-intercept: Where a graph crosses the y-axis.

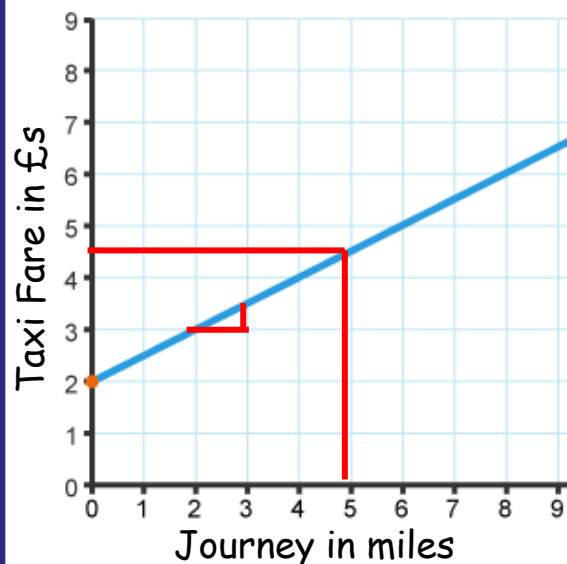
Gradient: The rate of change of one variable with respect to another. This can be seen by the steepness.

Simultaneous: At the same time.

Tip

The solution to two linear equations with two unknowns is the coordinates of the intercept (where they cross).

Examples



What is the minimum taxi fair?
£2, this is the y-intercept.

What is the charge per mile?
50p, every extra mile adds on 50p.

How much would a journey of 5 miles cost?

£4.50, See line drawn up from 5 miles to the graph, then drawn across to find the cost.

Y9

Questions

- 1) For the graph above a) A journey is 8 miles, what is its cost?
b) A journey cost just £3, how far was the journey?
- 2) Draw a graph to show the exchange rate $\text{£}1 = \$1.4$.



Maths Knowledge Organiser

PYTHAGORAS



Key Concepts

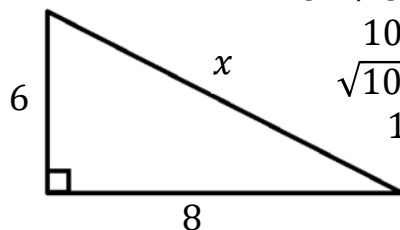
Pythagoras' theorem and basic trigonometry both only work with **right angled triangles**.

Pythagoras' Theorem – used to find a missing length when two sides are known

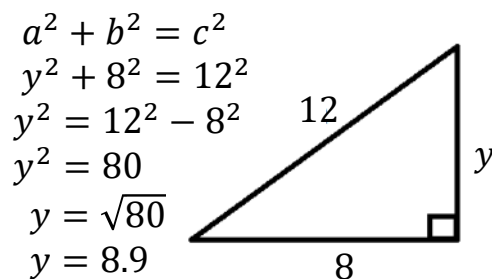
$$a^2 + b^2 = c^2$$

c is always the hypotenuse (longest side)

Pythagoras' Theorem



$$\begin{aligned}a^2 + b^2 &= c^2 \\6^2 + 8^2 &= x^2 \\100 &= x^2 \\\sqrt{100} &= x \\10 &= x\end{aligned}$$



$$\begin{aligned}a^2 + b^2 &= c^2 \\y^2 + 8^2 &= 12^2 \\y^2 &= 12^2 - 8^2 \\y^2 &= 80 \\y &= \sqrt{80} \\y &= 8.9\end{aligned}$$

Examples

Y9

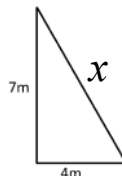
Key Words

Right angled triangle
Hypotenuse
Length
Shorter-side
Square
Square-root

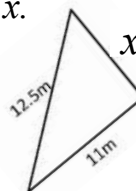
Questions

Find the value of x .

a)



b)



ANSWERS: a) 8.06m b) 5.94m



Maths Knowledge Organiser

TRIGONOMETRY



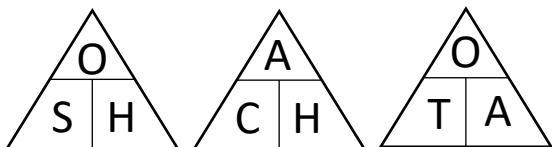
Key Concepts

Basic trigonometry SOHCAHTOA –

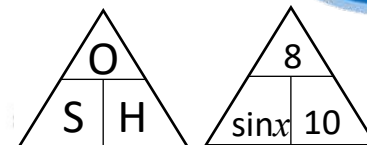
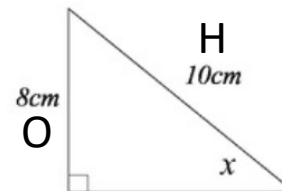
used to find a missing side or an angle in a right-angle triangle

Special angles:

- Sine $30^\circ = 0.5$
- Sine $0^\circ = 0$
- Sine $90^\circ = 1$
- Cosine $60^\circ = 0.5$
- Cosine $0^\circ = 1$
- Cosine $90^\circ = 0$

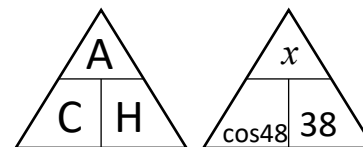


Examples



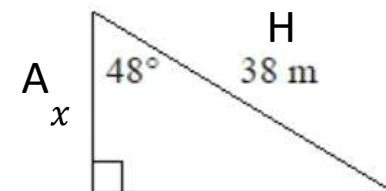
$$\sin x = \frac{8}{10}$$

$$x = \sin^{-1}\left(\frac{8}{10}\right) = 53.1^\circ$$



$$\cos 48 = \frac{x}{38}$$

$$x = 38 \times \cos 48 = 25.4m$$



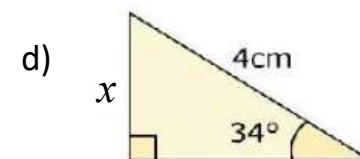
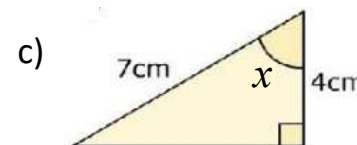
Y9

Key Words

Right angled triangle
Hypotenuse
Opposite
Adjacent
Sine
Cosine
Tangent

Questions

Find the value of x .



ANSWERS: a) 8.06m b) 5.94m c) 55.15° d) 2.34cm



AVERAGES FROM A TABLE

Key Concepts

Modal class (mode)
Group with the highest frequency.

Median group
The median lies in the group which holds the $\frac{\text{total frequency} + 1}{2}$ position.
Once identified, use the cumulative frequency to identify which group the median belongs from the table.

Estimate the mean
For grouped data, the mean can only be an estimate as we do not know the exact values in each group. To estimate, we use the midpoints of each group and to calculate the mean we find $\frac{\text{total } fx}{\text{total } f}$.

Examples

Length (L cm)	Frequency (f)	Midpoint (x)	fx
$0 < L \leq 10$	10	5	$10 \times 5 = 50$
$10 < L \leq 20$	15	15	$15 \times 15 = 225$
$20 < L \leq 30$	23	25	$23 \times 25 = 575$
$30 < L \leq 40$	7	35	$7 \times 35 = 245$
Total	55		1095

- a) Estimate the mean of this data.
step 1: calculate the total frequency
step 2: find the midpoint of each group
step 3: calculate $f \times x$
step 4: calculate the mean shown below

$$\frac{\text{Total } fx}{\text{Total } f} = \frac{1095}{55} = 19.9\text{cm}$$

- b) Identify the modal class from this data set. *“ the group that has the highest frequency ”*
Modal class is $20 < x \leq 30$
- c) Identify the group in which the median would lie. **Median = $\frac{\text{Total frequency} + 1}{2} = \frac{56}{2} = 28\text{th value}$**
“ add the frequency column until you reach the 28th value ” **Median is the in group $20 < x \leq 30$**

Y9

Key Words
Midpoint
Mean
Median
Modal

Cost (£C)	Frequency	Midpoint	
$0 < C \leq 4$	2		
$4 < C \leq 8$	3		
$8 < C \leq 12$	5		
$12 < C \leq 16$	12		
$16 < C \leq 20$	3		

- From the data:
- a) Identify the modal class.
b) Identify the group which holds the median.
c) Estimate the mean.

ANSWERS: a) $12 < C \leq 16$ b) $\frac{25+1}{2} = 13\text{th value}$ is in the group $12 < C \leq 16$ c) $\frac{294}{25} = £11.76$



Maths Knowledge Organiser

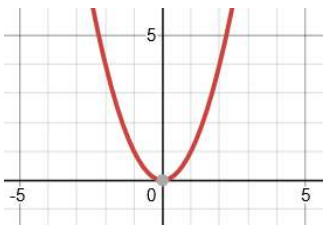
QUADRATIC GRAPHS



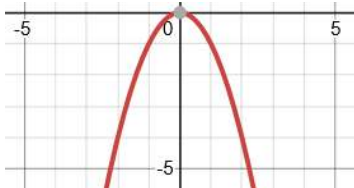
Key Concepts

A quadratic graph will always be in the shape of a parabola.

$$y = x^2$$



$$y = -x^2$$



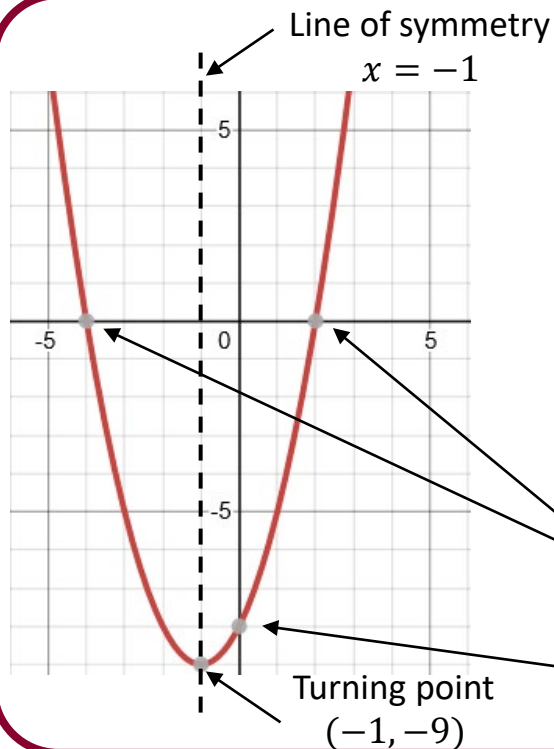
The roots of a quadratic graph are where the graph crosses the x axis. The roots are the solutions to the equation.

Examples

$$y = x^2 + 2x - 8$$

A quadratic equation can be solved from its graph.

The roots of the graph tell us the possible solutions for the equation. There can be 1 root, 2 roots or no roots for a quadratic equation. This is dependant on how many times the graph crosses the x axis.



Roots $x = -4$
 $x = 2$

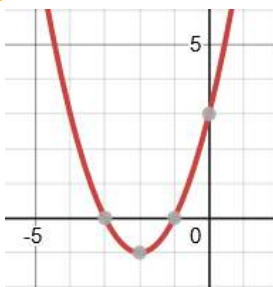
y intercept = -8

Turning point
 $(-1, -9)$

Y9

Key Words

Quadratic
Roots
Intercept
Turning point
Line of symmetry



Identify from the graph of $y = x^2 + 4x + 3$:

- 1) The line of symmetry
- 2) The turning point
- 3) The y intercept
- 4) The two roots of the equation

Maths Knowledge Organiser

EXPAND AND SIMPLIFY BRACKETS



Key Concepts

Expanding brackets

Multiply the number outside the brackets with EVERY term inside the brackets

Factoring expressions

Take the highest common factor outside the bracket.

Examples

Expand and simplify where appropriate

$$1) \quad 7(3 + a) = 21 + 7a$$

$$2) \quad 2(5 + a) + 3(2 + a) = 10 + 2a + 6 + 3a \\ = 5a + 16$$

$$3) \text{ Factorise } 9x + 18 = 9(x + 2)$$

$$4) \text{ Factorise } 6e^2 - 3e = 3e(2e - 1)$$

Factorise fully:

$$1) 16at^2 + 12at = 4at(4t + 3)$$

$$2) x^2 - 2x - 3 = (x - 3)(x + 1)$$

$$1) \quad 4(m + 5) + 3$$

$$= 4m + 20 + 3 \\ = 4m + 23$$

$$2) \quad (p + 2)(2p - 1)$$

$$= p^2 + 4p - p - 2 \\ = p^2 + 3p - 2$$

Questions

1) Expand and simplify

$$(a) 3(2 - 7f) \quad (b) 5(m - 2) + 6 \quad (c) 3(4 + t) + 2(5 + t)$$

2) Factorise

$$(a) 6m + 12t \quad (b) 9t - 3p \quad (c) 4d^2 - 2d$$

Key Words

Expand
Factorise
Simplify

Y9

MFL Knowledge Organiser

O Là où i'habite

Summer

T

il y avait
était: was
Ils/ elles étaient they were
Je voudrais/ j'aimerais habiter/vivre
I would like to live



Perfect Tense

PAST

123

Subjec t	Avoir	Past participle
J'	ai	Take off ending from infinitive:
Tu	as	
Il/elle	a	-er verbs = é
Nous	avons	-ir verbs = i
Vous	avez	-re verbs = u
Ils/elles	ont	

Perfect Tense

Subject	Être	Past participle
Je	suis	Take off ending from infinitive:
Tu	Es	
Il/elle	Est	-er verbs = é
Nous	Somme s	-ir verbs = i
Vous	Êtes	-re verbs = u
Ils/elles	sont	

****Agreement of PP**
(f) + e
(pl) + s
(f+pl) + es

IRREGULAR verbs
with avoir

J'ai eu: I had
J'ai bu: I drank
J'ai vu: I saw
J'ai lu: I read
J'ai fait: I did
J'ai dit: I said
J'ai écrit: I wrote

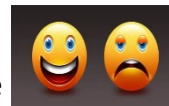
Subject	The IMPERFECT tense	
J'/ Je	habitAIS/ vivAIS	I USED TO live
Tu [SING]	habitAIS/ vivAIS	You USED TO live
Il/elle/ on	habitAIT/ vivAIT	He/she/ weUSED TO live
Nous	habitIONS	We USED TO live
Vous [PLUR]	habitIEZ	you USED TO live
Ils/elles	habitAIENT	They USED TO live



Opinions & Pronouns

me fascine ça/cela

me plaît



m'amuse

m'intéresse

me rend content(e)

m'énerv

m'ennuie

me fâche (angers me)

me rend triste

P

Connectives / Sequencers

alors /donc

car / parce que

d'abord

ensuite

après

finalement

so, therefore

because

first of all

next

afterwards

finally



C

trop

assez/très

un peu

vraiment

incroyablement

too

quite /very

a little /a bit

really

incredibly



Complexity

plus...que more ...than
moins...que less...than
aussi...que as...as
LE /LA /LES PLUS + ADJECTIF - the most

C

Adjectives

C'est comment? What is it like?

C' est/ il est/ elle est.

It is

Je trouve que c'est OR qu'il est OR qu'elle est...

TIF –

1. Selon moi
2. Selon mon copain..
3. je dirais que
4. À mon avis..

petit(e)(s)

small

grand(e)(s)

big

beau(x)/ belle(s)

beautiful

joli(e)(s)

pretty

vieux/vielle(s)

old

nouveau/nouvelle

new

neuf[s]/ neuve[s]

new

moderne(s)

modern

confortable(s)

comfortable

gros(se)(ses)

big (for objects)

calme[s]/tranquille[s]

quiet

bruyant(e)(s)

noisy



J'habite dans une **VIELLE**
maison qui est **MOINS**
confortable **QUE** la maison de
ma grand-mère.

1

Où habites-tu?

Where do you live?



A. WHERE I LIVE

J'habite à	I live in
une ville	a town
une grande ville	a city
à la campagne	in the countryside
à la montagne	in the mountains
au bord de la mer	at the seaside
près de la plage	near to the beach
près de l'autoroute	near the motorway
dans la banlieue de la ville	on the outskirts of town
une maison jumelle	a semi-detached house
une grande maison	a big house
une petite maison	a small house
un appartement	a flat
une ferme	a farm



2

Rooms of the house

le bureau	office
la cave	cellar
la chambre	bedroom
la cuisine	kitchen
le grenier	attic
le jardin	garden
la pièce	room
la salle à manger	dining room
la salle de bains	bathroom
la salle d'eau	wet room
le salon	living room
le séjour	room
le sous-sol	basement
le rez-de-chaussée	ground floor

3

Furniture

l'armoire	wardrobe
la bibliothèque	bookcase
le bureau	desk
le canapé	sofa
la chaise	chair
la commode	chest of drawers
l'étagère	shelf
le fauteuil	armchair
la fenêtre	window
le lit	bed
les meubles	furniture
le miroir	mirror
la peinture	painting
la porte	door
le tapis	rug

4



Adjectives placed before the noun

vieux/vieille	old
nouveau/nouvelle	new
beau/belle	beautiful
grand(e)	big
petit(e)	small
joli(e)	pretty

Adjectives placed after the noun

15

chère(e)	expensive
dur(e)	hard
propre	clean
agaçant(e)	annoying
douillet(te)	cosy
sombre	dark
animé(e)	lively
calme	quiet
historique	historic
touristique	touristic
artisanal(e)	hand-made
bon marché	cheap
fermé(e)	closed
gratuit(e)	free
ouvert(e)	open
pratique	practical
de taille moyenne	medium-sized
tard	late
tôt	early
bruyant(e)	noisy
sale	dirty

5



1. Il y a – there is / are
2. Est – it is ça sera – it will be
3. Sont – (they)are
4. A - has
5. Ont (they) have



How to form the future ten with ALLER...

You will need to remember one easy formula:

1	2	3
subject	present tense of aller	infinitive
Je	vais	manger
Tu	vas	jouer
il / elle / on	va	faire
Nous	allons	regarder
Vous	allez	finir
ils/elles	vont	aller

The Conditional “would”

	-er verbs
je / j'	habiterAIS [would live]
tu	habiterAIS
Il/elle/on	habiterAIT
Nous	habiterIONS
Vous (pl)	habiterEZ
Ils or elles	habiterAIENT



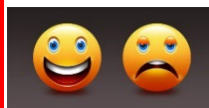
THE CONDITIONAL: time indicators

Un jour: one day
Si je pouvais : if I could
Si j'étais riche: If I were rich

O

Opinions & Pronouns

ÇA OR CELA me fascine OR me plaît OR m'intéresse OR m'amuse OR me rend content[e]



CELA or ça m'énerve

CELA or ça m'ennuie

CELA/ ça me fâche [angers me]

P

Connectives / Sequencers

alors /donc	so, therefore
car / parce que	because
beaucoup (de)	a lot (of)
d'abord	first of all
ensuite	next
après	afterwards
finalemt/enfin	finally

trop	too
assez/très	quite /very
un peu	a little /a bit
vraiment	really
incroyablement	incredibly

C

Complexity - comparisons

One can / People can + INFINITIVES

ON [NE] peut [PAS] VOIR: one can[NOT] SEE
ON [NE] peut [PAS] ALLER: one can[NOT] go
On [NE] peut [PAS] VISITER: one can [NOT] visit

C

BRAGS Adjectives

A

Beauty:

- 1 beau: handsome / beautiful
- 2 belle: beautiful
- 3 joli[e] : pretty

Ranks:

- 1 premier[e] : first
- 2 deuxième: second

Age:

- 1 jeune: young
- 2 neuf[ve]: brand new
- 3 viel, vieux, vieille: old
- 4 nouvel, nouveau, nouvelle: new

Goodness

- 1 gentil[e]: kind
- 2 bon[ne]: good
- 3 mauvais[e]: bad
- 3 méchant[e]: naughty

Size

- 1 petit[e]: small
- 2 grand[e]: tall
- 3 gros[sse]: fat
- 4 énorme: huge



1. Mon jardin est **PLUS** petit **QUE** ton jardin/ or **le tien (yours)**.
2. Ma maison est **BIEN PLUS** grande que ta maison/ or **la tienne (yours)**.
3. Paris est **LA PLUS** belle ville du monde.

Festivals	
 la fête	 festival/celebration/party
la fête des mères	Mothers' day
la fête des rois	Twelfth night/Epiphany
la fête du travail	May day
le Jour de l'An	New Year's day
la Saint-Sylvestre	New Year's Eve
Pâques	Easter
Noël	Christmas
le réveillon de Noël/la veille de Noël	Christmas Eve
la Chandeleur	Pancake day
Aïd el-Fitr	Eid al-Fitr
le Ramadan	Ramadan
le jeûne	fast
le jour férié	public holiday
la Saint Valentin	Valentine's day
la Toussaint	All Saints' day
la Pentecôte	Pentecost
poisson d'avril	April Fools' day

1

avoir (to have)		être (to be)	
j'ai	I have	je suis	I am
tu as	you have	tu es	you are
il/elle a	he/she has	il/elle est	he/she is
nous avons	we have	nous sommes	we are
vous avez	you have	vous êtes	you are
ils/elles ont	they have	ils/elles sont	they are

2

Past tense using avoir
To form the past tense, use 'avoir' + past participle for the majority of verbs
e.g. j'ai regardé (I watched) J'ai joué (I played)

Avoir past participles	
'er' verbs	Remove the 'er' and add 'é' e.g. regarder = regardé
'ir' verbs	Remove the 'ir' and add 'i' e.g. j'ai fini mon livre
're' verbs	Remove the 're' and add 'u' e.g. j'ai vendu mon livre
Common irregular verbs	
Faire	Fait
Voir	Vu
Lire	Lu

Traditions	
un char	a float
un défilé	procession /parade
un sapin	a Christmas tree
un muguet	a lily of the valley
une blague	a joke

4

Family traditions	
chez...	at's house
chez mes grandparents	at my grandparents' house
chez moi	at my house
un cadeau	a present
un repas	a meal
avec ma famille	with my family

5

Religion	
religieux/se	religious
chrétien(ne)	Christian
une église	a church
une messe	a mass
musulman(e)	Muslim
une mosquée	a mosque
juif/juive	Jewish
une synagogue	a synagogue

3

Verbs	
apporter	to bring
célébrer	to celebrate
chercher	to look for
se déguiser	to dress up
accrocher	to hang
s'arrêter	to stop
se dépêcher	to hurry
se reposer	to relax
se retrouver	to meet
récolter	to collect
rire	to laugh
assister	to attend
coûter	to cost
dormir	to sleep
durer	to last
se passer	to take place
sensibiliser	to increase awareness
voyager	to travel

7



6

Imperfect tense	
J'étais	I was
C'était	It was
J'avais	I had
Il y avait	There was/were
Il faisait chaud	It was hot
Il faisait froid	It was cold

8

Adjectives	
annulé(e)	cancelled
célèbre	famous
contemporain(e)	contemporary
déçu(e)	disappointed
gratuit(e)	free (of charge)
hilarant(e)	hilarious
rigolo(te)	funny
informatif/ve	informative
traditionnel(le)	traditional
passionnant(e)	exciting
populaire	popular
tard	late
tôt	early



Science Knowledge Organiser



P2: Forces and motion

Lesson sequence

1. Resultant forces
2. Newton's first law
3. Mass and weight
4. Newton's second law
5. Core practical – investigating acceleration (CP12)
6. Newton's third law
7. Momentum (HT)
8. Stopping distances
9. Car safety

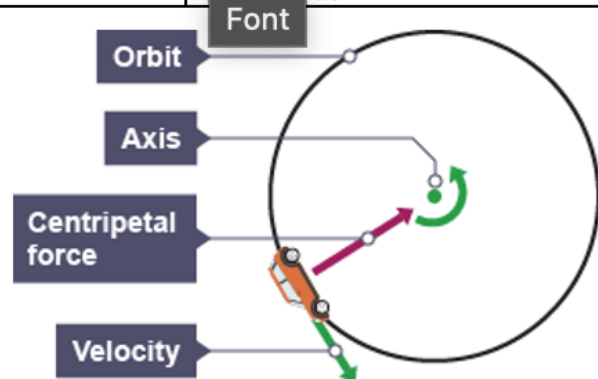
1. Resultant forces

*Scalar quantity	A quantity with magnitude (but no direction).
*Vector quantity	A quantity with magnitude and direction.
*Force arrows	Arrows can be used to represent forces: - Direction = direction of force - Length = size of force
**Resultant force	The force left over when forces acting in opposite directions are cancelled out.
**Calculating resultant force	Subtract the total force in one direction from the total force in the other direction.
*Balanced forces	When the resultant force is zero (because forces acting in opposite directions are the same size).
*Unbalanced forces	When the resultant force is non-zero (because there is more force in one direction than another).

2. Newton's first law

*Newton's first law of motion	An object will move at the same speed and direction unless it experiences a resultant force.
**The effect of resultant forces	Resultant forces cause acceleration: speeding up, slowing down or changing direction

**Effect of forces on motion	Forces make you start moving, stop moving or change direction, they are not needed to keep you moving!
***Circular motion	Moving in a circle is a type of acceleration because you are changing velocity (your direction changes even if your speed does not).
***Centripetal force	A force acting towards the centre of a circle that enables objects to move in a circle.
***Sources of centripetal force	Gravity – keeps the Earth orbiting the sun Tension – lets a bucket swing in circles on a rope Friction – keeps cars turn round a roundabout



3. Mass and weight

*Mass	The quantity of matter in an object is made of. Units = kilograms, kg.
*Weight	A force caused by gravity pulling downward on an object. Units = newtons, N.
*Force meter	An instrument for measuring forces. They usually involve a spring that stretched more the more the force.
**Gravitational field strength	The strength of gravity, which is different on different planets. Units = newtons per g=kilogram, N/kg.
**Gravitational field strength on Earth	10 N/kg

**Calculating weight	Weight = mass x gravitational field strength $W = m \times g$ Weight = N Mass = kg Gravitational field strength = N/kg
**Air resistance	A force greater by the air pushing against you as you move. Faster movement → greater air resistance.
***Motion whilst falling	Accelerate until the air resistance is equal to the weight; now there is no resultant force so speed stays constant.

4. Newton's second law

*Newton's second law of motion	Force = mass x acceleration
**Acceleration is greater when...	- The force is greater - The mass is smaller
*Calculating forces	Force = mass x acceleration $F = m \times a$ Force = N Mass = kg Acceleration = m/s^2
*Calculating acceleration	Acceleration = mass / force $a = F / m$ Force = N Mass = kg Acceleration = m/s^2
***Inertial mass	The mass calculated by measuring the acceleration produced by force, using the equation ' $m = F / a$ '
***The point of inertial mass	Inertial mass is the same as mass measured with a mass balance, but it gives us a way to measure mass where there is no gravity, such as in space.

5. Core practical – investigating acceleration (CP12)

*CP12 - Aim	To investigate how changing force changes acceleration.
*CP12 - Setup	A trolley on a ramp with 90 g masses. 10 g mass hanger attached to trolley via a string over a pulley.
*CP12 – Data collection	Release the trolley, use light gates to measure the acceleration.
*CP12 – Variations	Move 10 g of mass from the trolley to the mass hanger each time.
*CP12 – Independent variable	The force: each 10 g mass = 0.1 N force
*CP12 - Results	Ore mass → more force → greater acceleration.

6. Newton's third law

*Newton's third law	For every action force there is an equal but opposite reaction force.
*Action force	The force you push or pull with.
*Reaction force	A force of the same size but opposite direction to an action force.
*Action-reaction forces	If, A applies an action force to B, B applies a reaction force of same size and opposite direction to A.
**Action-reaction vs balanced forces	Similarities: same sizes, opposite directions Differences: balanced forces act on same object, action-reaction act on different objects
***Action-reaction forces - collisions	E.g. kicking a ball: the foot pushes the ball, the ball pushes back on the foot.

7. Momentum (HT)

*Momentum	The tendency of an object to keep moving.
------------------	---

*Calculating momentum	Momentum = mass x velocity field strength $p = m \times v$ Momentum = kg m/s Mass = kg velocity = N/kg
Momentum and force calculations	Force = change in momentum / time $F = (mv - mu)/t$ Force = N Mass = kg Velocity = m/s Time = s
***Conservation of momentum	Total momentum before and after a collision is the same.

8. Stopping distances	
*Stopping distance	The distance travelled from when a hazard is seen to when you fully stop.
*Thinking distance	The distance travelled from when a hazard is seen to when you brake.
*Braking distance	The distance travelled from when you brake to when you fully stop.
**Calculating stopping distance	Stopping distance = thinking distance + braking distance
**Thinking distance and reaction time	Slower reactions = greater thinking distance
**Thinking distance increased by...	Higher speed, tiredness, illness, drugs, distractions, old age
**Braking distance increased by	Higher speed, poor brakes, poor tyres, wet/icy/gravelly road, downhill, heavier load

9. Crash hazards	
**Crash danger	Crashes involve large decelerations, creating large forces which can injure you.
**Car safety features	Increase the time a collision takes, reducing deceleration and forces.

**Three car safety features	Crumple zones, (stretchy) seat belts, air bags
***Collision forces	Greater momentum change → greater force
**Calculating collision forces	Force = change in momentum / time $F = (mv - mu)/t$ Force = N Mass = kg Velocity = m/s Time = s



Science Knowledge Organiser



B3: Genetics

Lesson sequence

1. Meiosis
2. DNA
3. DNA extraction
4. Alleles
5. Inheritance
6. Gene mutation
7. Variation

1. Meiosis

*Gametes	Egg cell and sperm cell
*Fertilisation	Sperm cell fuses with egg cell and nuclei combine
*Zygote	Single cell formed by fertilisation
*Gene	Length of DNA coding for a protein. Controls your characteristics
*Genome	All the DNA and genes in an organism
*Protein	Polymer made from amino acids
**Polymer	Long molecule made by chaining together many shorter ones
*Diploid	A cell with 23 pairs of chromosomes (46 in total)
*Haploid	A cell with 23 single chromosomes
*Meiosis	Cell division that makes gametes
**Meiosis stages	DNA replicates, cell divides into 2 diploid cells, these divide into 4 haploid daughters.
**Why gametes are different	Chromosomes in a pair are slightly different. Different gametes get different combinations of chromosomes.

2. DNA

*Chromosome	Large DNA molecule made into a small package by tightly coiling DNA around a protein.
*DNA structure	Two strands, double helix, complementary base pairs, sugar-phosphate backbone

*DNA bases	Adenine, A; thymine, T; cytosine, C; guanine, G
*Complementary base pairs	A <u>pairs</u> with T C pairs with G
**Hydrogen bonds	Weak force holding the two strands of DNA together.
**DNA analysis	Uses small differences in DNA to determine family relationships or link people to crimes.

3. DNA extraction

*DNA extraction: Mix water, salt and detergent.	Salt makes DNA clump together, detergent breaks down cell membranes to release DNA
*DNA extraction: Mash fruit/veg and add the solution	Increases the surface area
*DNA extraction: Leave in water bath at 60°C	Heat makes it react quicker
*DNA extraction: Filter the mixture and collect filtrate	To remove unwanted lumps
*DNA extraction: Measure out 10 cm³ of filtrate	It's easier to work with a small amount
*DNA extraction: Add two drops of protease solution	Protease breaks down proteins around the DNA
*DNA extraction: Gently add ice-cold ethanol	DNA is insoluble in ethanol so precipitates
*DNA extraction: Leave for several minutes	So white DNA layer forms

4. Alleles

*Allele	Different version of the same gene. We have two alleles of each gene.
**Homozygous	We have two copies of the same allele
**Heterozygous	We have two different copies of an allele

*Dominant allele	One copy needed for characteristic to show. Written as a capital.
*Recessive allele	Two copies for the characteristic to show. Written as lowercase.
*Genotype	The combination of alleles in an organism.
*Phenotype	The characteristics produced by the alleles.
**Genetic diagram	Shows the likelihood of offspring produced by parents with certain genotypes

5. Inheritance

*Sex chromosomes	Female: XX Males: XY
*Inheriting sex	All eggs are X, 50% of sperm are X and 50% are Y, so 50% of zygotes are XX and 50% are XY
*Punnett squares	Uses the genotypes of male and female gametes to predict the genotypes of the offspring.
**Probability and Punnett squares	Punnett squares tell you the likelihood of certain offspring, not what will actually happen.
**Cystic fibrosis	Illness caused by <u>a</u> inheriting two copies of a faulty recessive allele.
**Family pedigree chart	Chart showing how genotypes are inherited down through a family.

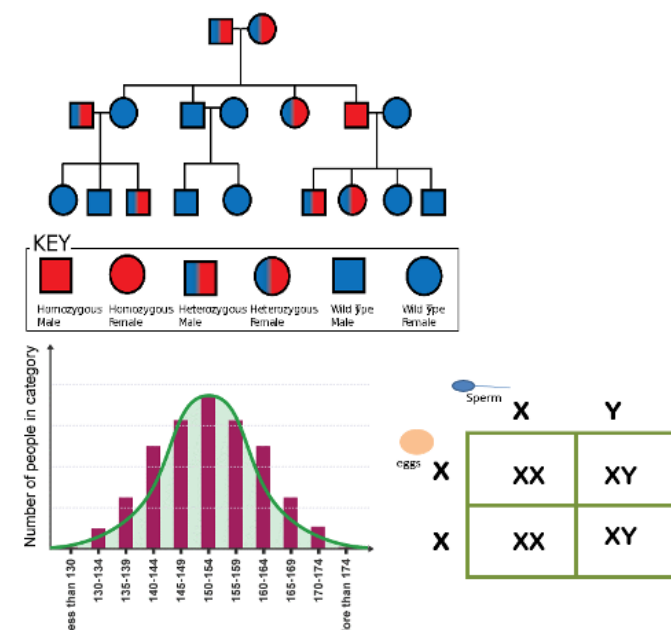
6. Gene mutation

*Mutation	A change to the bases in a gene.
**Effect of mutations	Change the structure of a protein and how it works. Sometimes harmless, normally harmful, very rarely beneficial
*Cause of mutations	Mistakes copying DNA during cell division, DNA damage from chemicals or radiation
*Inheriting mutations	Only if they occur in gametes (egg and sperm)
*Human Genome Project	(HGP) Project involving many scientists from many countries to find the order of bases in human DNA

**How is the HGP useful?	To tailor drugs to genes, to design better drugs
**Genetic differences	HGP found 99% of DNA in all people is identical.

7. Variation

*Variation	Natural differences between members of a species that affect the chance of survival.
*Genetic variation	Variation caused by genes
*Environmental variation	Caused by interaction with the surroundings – such as food, climate etc.
*Causes of most variation	A combination of genes and the environment.
**Acquired characteristics	Changes caused by the environment during your lifetime, such as losing a leg
**Continuous variation	Can be anywhere within a range, such as <u>height</u> , following a normal distribution.
**Discontinuous variation	Can be only one of a few possibilities, such as blood type: A, B, AB, O
**Normal distribution	Bell-shaped curve with more in the middle and fewer either side.





Science Knowledge Organiser



B4: Evolution

Lesson sequence

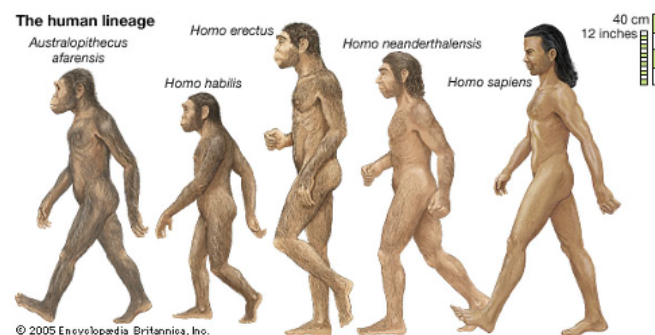
1. Human evolution
2. The theory of evolution
3. Resistance
4. Classification
5. How to modify species
6. Problems with modifying species
7. Genetic engineering of bacteria (HT)

1. Human evolution

*Binomial naming	Two-part names, first part = genus, second part = species. Written in italics.
*Homo sapiens	Our species. Evolved about 200,000 years ago. Skull volume 1450 cm ³ .
**Ardipithecus ramidus	Aka 'Ardi'. 4.4 million years ago, walked upright and climbed trees, 350 cm ³ skull volume.
**Australopithecus afarensis	Aka Lucy. 3.2 million years ago, walked upright, skull volume 400 cm ³ .
**Homo habilis	2.4-1.4 million years ago, walked upright, skull volume 5-600 cm ³ .
*Homo erectus	1.8 to 0.5 million years ago, walked upright, skull volume 850 cm ³ .
*Fossil evidence	Many fossils have been found showing a gradual transition from 'ape-like' to 'human-like'.
**Stone tool evidence	Older stone tools are simpler requiring less intelligence to make, younger stone tools are more complex requiring more intelligence to make.

**The Leakeys

Mary and Louis discovered *Homo habilis*, their son Richard worked on *Homo erectus*.



2. The theory of evolution

*Charles Darwin	Develop the theory of evolution.
*Evolution	The way that species develop by gradual changes over many generations due to natural selection.
*Variation	Natural differences between members of a species that affect the chance of survival.
**Mutations and evolution	Changes in DNA cause variation.
**Environmental change	Change to factors such as food supply, climate or predators.
*Competition	The fight to eat, survive and breed.
*Natural selection	Organisms with the best genes and characteristics are more likely to survive, breed and pass on their better genes.
*Inheritance	Gaining your genes from your parents.
**Well adapted	An organism has features that make it better able to survive and breed.
**Evolution and the individual	An individual does not evolve during its lifetime, populations of organisms evolve over many lifetimes.

**Human evolution

Humans did not evolve from chimpanzees, we both evolved from a common ancestor.

3. Resistance

*Resistance	The natural ability of some members of a species to survive poisons that would kill the other members.
*Evolution of resistance	Evolution of organisms that stops them from being affected by poisons.
**Rats and warfarin resistance	Warfarin is used to kill rats. Some rats were naturally resistant, survived the warfarin, bred and passed on their resistance genes.
**Antibiotic resistance	Antibiotics are used to kill bacteria. Some bacteria were naturally resistant, survived the antibiotics, bred and passed on their resistance genes.
**The problems of resistance	Antibiotic resistance means that many infections that used to be simple to treat may become too resistant to treat, causing major health problems.

4. Classification

*Carl Linnaeus	Developed the modern system of classification.
*How to classify	Based on similarities, group things into smaller and smaller groups with fewer and fewer similarities.
*Problems with classification	Sometimes organisms that look similar are not actually related.
*Kingdoms	Old idea, classifying living things into five kingdoms (including plants, animals and fungi)
**Carl Woese	Developed the modern system of classification with three domains.
*Domains	Modern idea of classifying living things into three main groups: bacteria, Archae, Eukarya.

**Bacteria

Single-celled organisms with no nucleus and no unused sections of DNA.

**Archae

Single-celled organisms with no nucleus but with unused sections of DNA.

**Eukarya

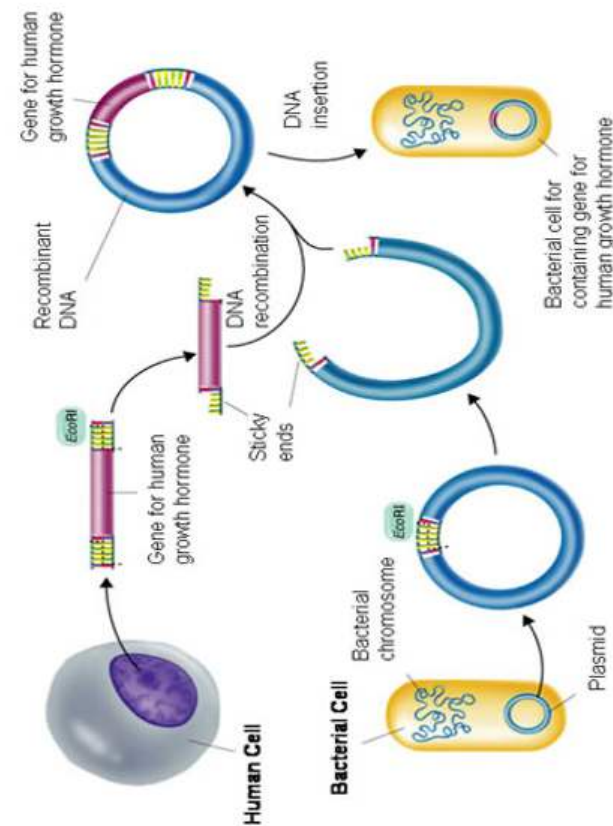
(Often) multi-cellular organisms with a nucleus and unused sections of DNA. Includes plants, animals, fungi and protists.

5. How to modify species

*Artificial selection	When humans (normally farmers) select the animals/plants to breed with the best characteristics.
*Selective breeding	Developing new breeds of plants or animals with better characteristics by selective breeding over many generations.
**Selective breeding in practice	Choose parents with the best characteristics, breed them together, choose from their offspring with the best characteristics, breed them together, repeat for many generations.
*Genetic engineering	Changing the characteristics of organisms by giving them genes from another organism.
*GMO	Genetically modified organism: an organism that has had its genes changed.
**Bt corn	Corn containing a gene from <i>Bacillus thuringiensis</i> that makes it produce a substance called Bt which kills insects.
*Medical GMOs	GM bacteria are used to make insulin (for diabetes) and some antibiotics.
**Pros and cons of GM	Quicker than selective breeding and can introduce more different characteristics but is expensive.

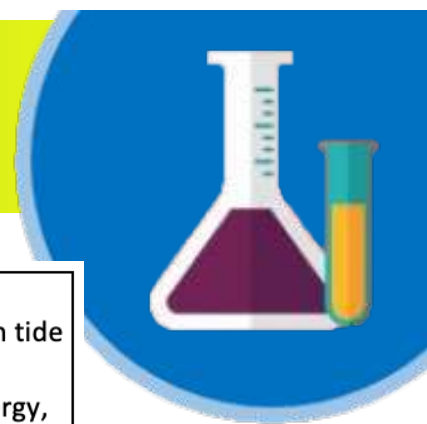
6. Problems with modifying species	
Over-selection	Farmers focussing too much on breeding for one characteristic (such as chicken breast size), don't spot problems with other characteristics (such as weak leg bones) causing suffering.
Gene leakage	The concern GMOs could breed with wild relatives, enabling the modified genes to escape into the wild. This could have ecological impacts.
Resistance	The concern that in areas growing Bt corn, insects simply evolve resistance to Bt.
Insulin	Insulin made by GM bacteria is not identical to human insulin, and some people suffer bad reactions to it.

7. Genetic engineering of bacteria (HT)	
**Plasmid DNA	Small loops of DNA containing a few genes.
***Restriction enzyme	Enzymes that cut DNA, leaving sticky ends at each end of the piece of DNA.
***Sticky end	A short sequence of unpaired bases at the end of a piece of DNA.
***Ligase	An enzyme that joins two pieces of DNA by matching up the bases on their sticky ends.
***Recombinant DNA	DNA produced by combining together two or more pieces of DNA.
***How to genetically engineer bacteria	Cut out gene using restriction enzymes, remove plasmids from bacteria and open with restriction enzymes, use ligase to join gene and plasmid together, return plasmids to bacteria.





Science Knowledge Organiser



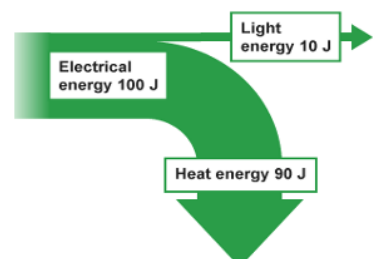
P3: Energy

Lesson sequence

1. Storing and transferring energy
2. Energy efficiency
3. Insulation
4. Stored energy
5. Non-renewable energy resources
6. Renewable energy resources

1. Storing and transferring energy

*Energy	The capacity to do work.
*Joules	The units of energy, symbol = J.
*Kilojoules	1000 J, <u>symbol = kJ</u> .
*Thermal energy	Energy stored on hot objects.
*Kinetic energy	Energy stored in moving objects.
*Chemical energy	Energy stored in chemicals such as fuels.
*Nuclear energy	Aka atomic energy. Energy stored in the nucleus of atoms.
**Gravitational potential energy	Energy stored in objects based on how high they are.
**Elastic potential energy	Aka strain energy. Energy stored in bent or stretched objects.
**Other forms of energy	Light, sound, electrical.
**First law of thermodynamics	Energy cannot be created or destroyed, just transferred from one form to another.
**Energy transfers	Say what form the energy starts as <i>and</i> what it becomes.
**Sankey diagram	Shows energy transfers. The thickness of the arrow relates to the amount of energy.



2. Energy efficiency

**Dissipation	The way energy spreads out, becoming less useful as it does.
*Wasted energy	Energy that is transferred into forms that can't be used.
*Friction	Causes energy loss as heat when two surfaces rub together.
**Lubrication	Allows surfaces to move smoothly, reduces energy loss from friction.
**Electrical resistance	Causes wires to heat up, wasting electrical energy.
*Calculating efficiency	$\text{Efficiency} = \frac{\text{useful energy transferred}}{\text{total energy transferred}}$
**Energy efficiency numbers	Efficiency is between 0 and 1. 1 = no energy wasted, 0 = all energy wasted.

3. Insulation

*Convection	Heat transfer caused when hot fluids (gas or liquid) rise because they are less dense.
*Conduction	Heat transfer through solids caused by vibrating particles bumping into each other.
*Radiation	Heat transfer by infrared radiation which heats objects up when they absorb it.
**Insulation	Materials that contain lots of tiny air pockets that prevent heat loss by conduction.
**Thermal conductivity	A measure of how well a material conducts heat.
**Draught-proofing	Sealing gaps around doors and windows to prevent heat loss by convection.

4. Stored energy

*Calculating kinetic energy	$KE = \frac{1}{2}mv^2$ Where 'KE' is kinetic energy in J, 'm' is mass in kg, 'v' is velocity in m/s.
**Calculating v from KE	$v = \sqrt{\frac{2KE}{m}}$

**Gravitational field strength	The strength of gravity. Different on different planets. On earth: 10 N/kg.
**Calculating gravitational potential energy	$GPE = mgh$ Where 'GPE' is gravitational potential energy in J, 'm' is mass in kg, 'g' is gravitational field strength in N/kg, 'h' is height change in m.

5. Non-renewable energy resources

*Fossil fuels	Coal, oil, natural gas. All are non-renewable.
*Non-renewable resource	A resource that will one day run out because it is being used faster than it is being made.
**Harm from burning fossil fuels	Carbon dioxide gas is released which causes global warming. Sulfur dioxide is released which causes acid rain.
*Renewable resource	A resource will not run out.
*Nuclear power	Electricity generated from nuclear fuels such as uranium.
**Nuclear power pros and cons	😊 Lasts a long time, releases no carbon dioxide 😞 Produces very harmful waste, expensive to decommission, although rare, accidents are very dangerous.

6. Renewable energy resources

*Wind power	Large turbines spun by the wind. 😊 No CO ₂ 😞 Lots needed, <u>ugly?</u> , no wind no power
*Solar power	Solar cells turn sunlight to electricity. 😊 No CO ₂ 😞 No sun no power, need lots of space, not suitable for all countries
**Tidal power	Uses water movement from tides to spin turbines

**Tidal barrage	A damn built across an estuary that fills up when tide goes in. 😊 Huge amounts of energy, no CO ₂ 😞 Destroys important mudflat habitats
**Hydroelectricity	A damn is built across a river valley, water released from the damn <u>spins</u> turbines. 😊 Lots of energy, no CO ₂ 😞 Destroys habitat by flooding
*Biofuels	Fuels made from recently plant or animal matter, often waste. 😊 Carbon neutral 😞 Needs a lot of land, increases food prices
**Carbon neutral	When burning a fuel releases the same CO ₂ it absorbed when it was growing, so there is no CO ₂ increase.



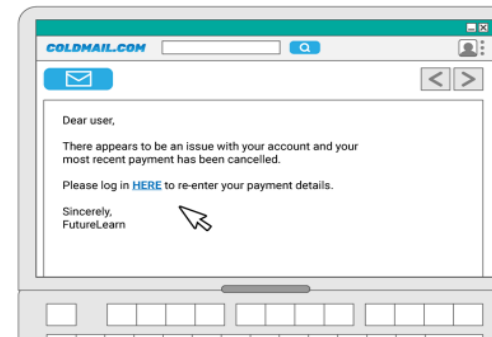
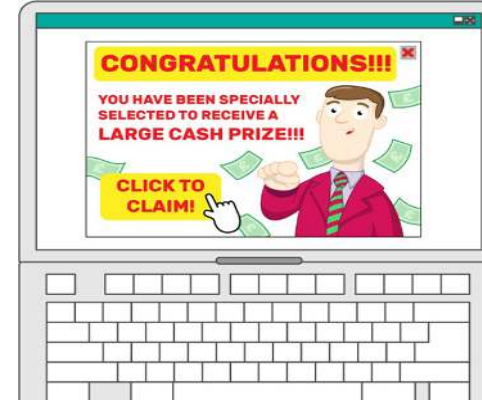
Computer Science Knowledge Organiser



CYBERSECURITY

Key words

adware	advertises for products a user may be interested in, based on internet history
authentication	verifying the identity of a user or process
biometrics	'password' created from the user fingerprint, iris, retina, facial, voice
blagging	inventing a scenario to obtaining personal information
CAPTCHA	Completely Automated Public Turing Test To Tell Computers and Humans Apart
DoS/DDoS	Denial of Service attack/Distributed Denial of Service
encryption	mathematically converts data into a form that is unreadable without a key
firewall	checks incoming and outgoing network traffic for threats
hacking	gaining unauthorised access to or control of a computer system'
malware	a variety of forms of hostile or intrusive software
penetration testing	testing a network/program for vulnerabilities
pharming	redirecting web traffic to fake websites designed to gain personal information
phishing	messages designed to steal personal details/money/identity
ransomware	virus which locks a computer and encrypts files until a "ransom" is paid
script kiddies	hackers with no technical hacking knowledge using downloaded software
shouldering	directly observing someone enter personal details e.g. PIN number, password.
social engineering	manipulating people so they give up personal/confidential information
spyware	gathers information about a person or organisation without their knowledge
trojans	masquerades as having a legitimate purpose but actually has malicious intent
viruses	self-replicating software attached to another program/file
worms	Replicate and spread through the network



Cybersecurity looking at common attacks and methods to protect ourselves and our networks against these attacks.

Data: raw facts and figures

Information: data that has been processed and has context

Data Protection Act 2018:

All organisations and people using and storing personal data must abide by the DPA principles. It states how data should be stored/accessed and what rights a data subject has for the protection of their data.

Computer Misuse Act 1990: It is an offence to

have unauthorised access to computer material

have unauthorised access with intent to commit or facilitate the commission of further offences

commit unauthorised acts with intent to impair, or with recklessness as to impairing, the operation of a computer.

Hacking in the context of cyber security is gaining **unauthorised** access to or control of a computer system.

Unethical versus ethical hacking

Penetration testers (pen testers) are people who are paid to legally hack into computer systems with the sole purpose of helping a company identify weaknesses in their system.



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REPRESENTATIONS GOING AUDIO VISUAL

Key Words	
Binary number	A number system that contains two symbols, 0 and 1. Also known as base 2
Pixel	The elements of a digital image are called pixels (picture elements)
Bit (b)	The smallest unit of data. 0 or 1.
Resolution	The number of pixels in a digital image.
megapixels	1 Megapixel is a million individual pixels.
Colour depth	The fixed number of binary digits used to represent each pixel's colour. E.g. in a black and white image we would only need to use 0 for white and 1 for black so we have a colour depth of 1 bit.
Bitmaps or raster images	Digital images that are formed using a binary representation of each pixel's colour.
RGB colour	One way of representing colour is to use a sequence of 24 bits, which are divided into three separate 8-bit components, each representing the quantity of red, green, and blue in the combination .
Representation size	How many bits are required to represent an image or sound
Digitising	Converting analogue data to digital data.
Sampling rate	The number of samples taken per second.
Sample Size	The number of bits recorded per sample.

Sound Representation Size = Sampling rate x sample size x duration x channels

Image Representation Size = Resolution (rows x columns) x Colour depth

1100
1010
0101

Computers represent all data, including numbers, letters, symbols, images, videos and sounds using binary numbers. All binary numbers are made up of the digits 0 and 1.

0s and 1s are called binary digits, or bits. All characters are represented using sequences of bits.

Computers only use the two binary digits 0 and 1 because all computers are built out of electrical switches which can only be on (1) or off (0).

When computers store **bitmap or raster** images they are broken down into individual elements called **pixels** and each pixel is represented by a binary number which the computer can interpret to determine what colour to display.



The **more pixels** you have in an image the **higher the resolution is**. This allows you to capture more detail and have **higher quality** but it also makes the **file larger** which means you need more storage space, **more processing time** and **more time for transmission** (e.g. over the internet)

Image manipulation is when we change or edit an image in some way. No matter what type of manipulation we use, the computer has to perform arithmetic operations on the digits that store our image in order for our changes to be displayed.

All sound is created by a variation in air pressure. Microphones convert those variations in air pressure into variations in electric voltage. Digital devices represent these waveforms as sequences of bits this is called digitising.



Computer Science Knowledge Organiser



INTRODUCTION TO PYTHON

Python is a **text** based **programming language**. That can be used to create programs, games, applications and much more!

A **program** is a set of precise instructions, expressed in a **programming language**. **Translating** the programming language is necessary for a machine to be able to **execute** the instructions.

To execute a Python program, you need a **Python interpreter**.

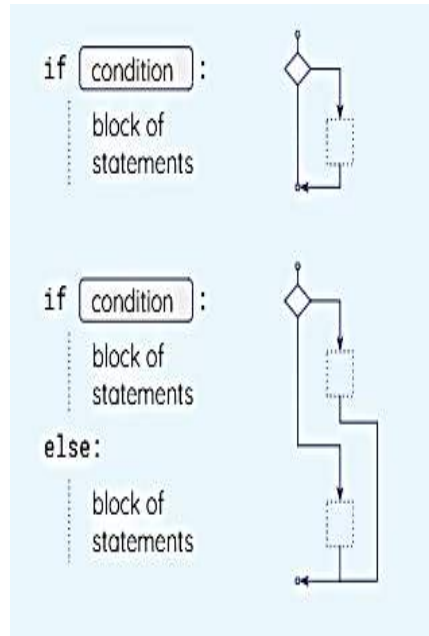
This is a program that translates and executes your Python program.

Syntax Errors

All programming languages have rules for **syntax**, i.e. how statements can be assembled. Programs written in a programming language must follow its syntax. Programs with **syntax errors** cannot be translated and executed.

You can use multiple branches using **if**, **elif** and **else**

Python helps by telling the programmer where the error is. So if you see red error text—read it first.



Useful snippets of code

<code>print ("Year 8")</code>	Will display the string "Year 8"
<code>input ()</code>	Reads a line of text from the keyboard and returns it
<code>variable name = expression</code>	Allows an expression to be assigned to a variable. E.g. <code>year=1944</code>
<code>Name=[item1, item2, item3]</code>	Allows creation of a list e.g. <code>shopping = ["oranges", "apples", "pears"]</code>

Data types

Whole numbers—**integer**

Yes/no or True/False—**boolean**

Letters, combination of letters, numbers—**string**

Arithmetic operators

+ addition
- difference
* multiplication
/ division
// integer division
% remainder of integer division
** exponentiation (to the power of)

Some common syntax errors in selection

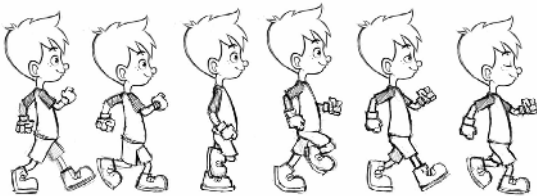
- use **if** and **else**—no capitals
- A colon **:** is always required after the condition and after **else**.
- Use **indentation** to indicate which statements 'belong' to the **if** block and the **else** block.
- The **==** operator checks for equality.
- A single **=** is only used in assignments



python™



Computer Science Knowledge Organiser



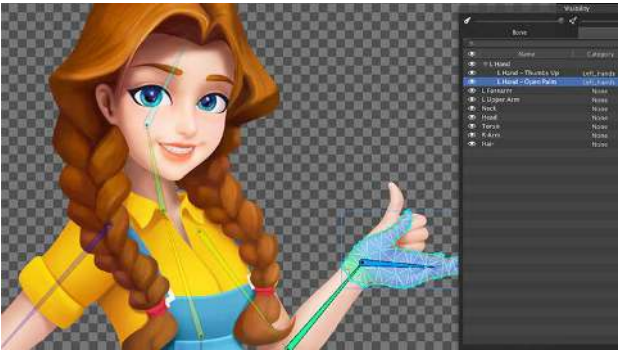
MEDIA ANIMATIONS

Stop motion - manually animate every frame of the animation e.g. Shaun the Sheep

- slower to make animations
- More difficult to edit

Keyframe animation - pick the important locations, the keyframes and the computer works out the rest (called tweening) e.g. Pixar films

- Faster to make animations
- Easier to edit
- Smoother animations
- Repeatable



Key words		
add	colour	cut
edge	knife tool	extrude
face	keyframe	focus
edit	vertex	location
loop	tweening	object
organic	proportional	rotate
render	ray tracing	scale
timeline	subdivision	mode



STOP MOTION
ANIMATION

Definitions	
Face:	A surface made up of three or more sides. Faces are often referred to as polygons .
Vertex:	A point where one or more edges meet
Edge:	A line connecting two vertices
Objects:	Scenes are made up of geometric, control, lamp and camera objects
Keyframes:	Used for tracking change, a key is a marker in time
Ray tracing:	Rendering that involves tracing the path of a ray of light through the scene
Rendering:	The process of computationally generating a 2D image from 3D geometry
Subdivision:	Creating smooth higher poly surfaces which can take a low polygon mesh as input.
Proportional editing:	Transforming selected elements
Extrude:	Extend an object



Smart Materials

Type	Smart Property	Uses
Thermochromic pigments	Change colour with temperature	Plastic strip thermometers Mugs or spoons that change colour when hot Test strips on batteries
Photochromic pigments	Change colour with light	Lenses in sunglasses that get darker as the light gets brighter Security markers that can only be seen in UV light
Shape Memory Alloy (SMA)	If bent, will return to their original size when heated.	Spectacle frames Sensors in fire sprinkler systems Electric door locks



Product Analysis



Modern Materials

Type	Properties	Uses
Graphene	Hard and extremely strong Good conductor Flexible	Solar cells Ink that conducts electricity In the future it could be used to develop flexible technology
Composite Glass Reinforce Polymer <i>Fibreglass</i>	The polymer is flexible and the glass fibres are strong but brittle. Together they make a composite that is tough and strong.	Hulls of boats 
Composite Carbon Reinforced Polymer	Polymers are reinforced with carbon fibres making it extremely strong.	Crash helmets Frames for high performance racing bikes Racing cars 
Composite Reinforced Concrete	Cement has good compressive strength but poor tensile strength. This is reinforced with steel bars which have good tensile strength.	Construction of buildings and bridges 



Nanomaterials are tiny particles of 1 to 100 nanometres (nm) that can be used in thin films or coatings such as the oleophobic coatings on smartphone screens that repel greasy fingerprints, or hydrophobic materials that repel water.



FERROUS	Properties	Uses	Products
Cast iron	Cheap to produce, easy to cast, is rigid, has high compressive strength, machines and absorbs vibrations well, has low tensile strength, it is brittle and cannot be forged	Pans, brake discs, large castings	
High-carbon steel (tool steel)	Hard but brittle, less malleable than mild steel, good electrical and thermal conductivity	Taps and tools, eg screwdrivers and chisels	
Low-carbon steel (mild steel)	Ductile and tough, easy to form, braze and weld, good electrical and thermal conductivity but poor resistance to corrosion	Nuts, bolts, screws, bike frames and car bodies	

NON FERROUS	Properties	Uses	Products
Aluminium	Light in weight and malleable but strong, a good conductor of heat and corrosion resistant	Drink cans, saucepans, bike frames	
Copper	An excellent electrical conductor of heat and electricity, extremely malleable and can be polished, oxidises to a green colour	Plumbing fittings and electrical wires, professional chef's saucepans	
Silver	A precious metal that is soft and malleable when heated, highly resistant to corrosion and an excellent electrical conductor of heat	Jewellery	

ALLOYS	Properties	Uses	Products
Brass (alloy of copper and zinc)	Non-ferrous metal that is strong and ductile, casts well and is gold coloured but darkens when oxidised with age, a good conductor of heat	Taps, screws, castings, locks and doorknobs	
Bronze (alloy of copper, aluminium and/or nickel)	Non-ferrous alloy, harder than brass and corrosion resistant, reddish/yellow in colour	Castings, bearings	
Stainless steel (alloy of steel also with chromium, nickel and magnesium)	Ferrous metal that is silver when polished, hard and tough with excellent resistance to corrosion	Cutlery, sinks, saucepans, surgical equipment	



Manufacturing Methods

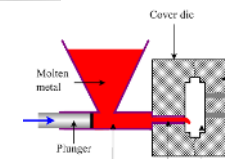
Natural and Manufactured Timbers	Metal	Polymer	Paper and Boards
Steam Bending Vacuum Press	Injection Moulding Extrusion	Injection Moulding Extrusion Blow Moulding Vacuum forming	Die Cutter Lithography Printing Screen Printing

Scales of Production

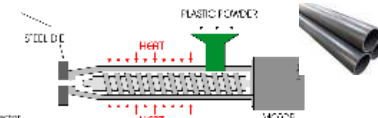
	Advantages	Disadvantages
One off	High-quality craftsmanship, prototypes can be tested	Expensive, requires specialist labour, time consuming
Batch	Volumes are made for demand which reduces waste, templates and jigs can be reused to produce identical products	Downtime between batches
Mass	High volumes can be produced, materials can be bulk purchased at cheaper rates, low-skilled workforce required	Expensive to set up because of specialised equipment, expensive machinery repairs
Continuous	24/7 production using an automated system, high volumes can be produced, materials can be bulk purchased at cheaper rates, low-skilled workforce required	Expensive to set up because of specialised equipment, expensive machinery repairs



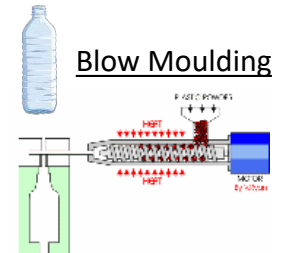
Die Casting



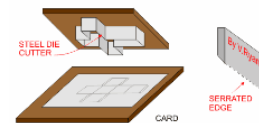
Extrusion



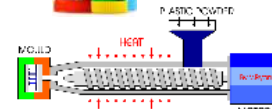
Blow Moulding



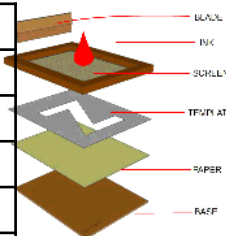
Die Cutter



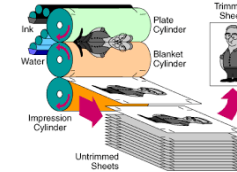
Injection



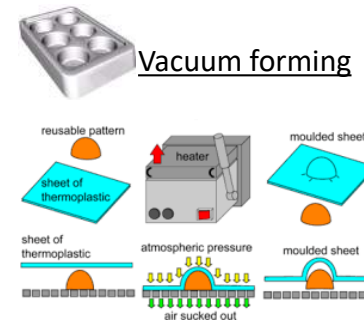
Screen Printing



Lithography



Vacuum forming



6Rs Refuse	Is the product necessary?
Rethink	Are there alternative materials or design options that are more sustainable?
Reduce	Can the product be made from fewer materials? Can the amount of unsustainable materials be reduced?
Reuse	Can parts of the product be reused in a different product?
Recycle	Can the materials used be recycled? If the product made from recycled materials?
Repair	Can the product be repaired rather than being thrown away if it breaks?



CAD	This is using computer software to draw and model a product. Examples: 2D Design, Photoshop, Macromedia Fireworks and Sketch Up Advantages: • Designs can be shared electronically • Accurate • Designs can be easily edited Disadvantages: • Software and training can be expensive • Security issues
CAM	This is using computer software to control machine tools to make products. Examples: Laser Cutter, 3D printer Advantages: • Faster • Complicated shapes are easily produced • Exact copied are easily made • Machines can run 24/7 Disadvantages: • High initial set up costs as CAM machines are expensive



AUTODESK
TINKERCAD



Ergonomics and Anthropometrics

Anthropometrics is the practice of taking measurements of the human body and provides categorised data that can be used by designers. Anthropometrics help designers collect useful data, eg head circumferences when designing a safety helmet. In this example, as there is a large variation in size, the designer would need to build some adjustment into the safety helmet design.

Ergonomics can incorporate the use of **anthropometric data** when designing products to improve the user experience. If a designer doesn't use anthropometric data during the design process, it can lead to a poor user experience that causes discomfort, pain and potential injury. **Ergonomics** is a consideration that leads to a product being designed in a way to make it easy to use. Size, weight, shape, position of buttons and controls are all aspects that contribute to it being ergonomically designed.



Market Pull and Technology Push

Market Pull is when a new product is produced in response to demand from the market.

Technology Push is when a development in materials, components or manufacturing methods leads to the development of a new product.

Life Cycle Analysis

A **Life Cycle Analysis** is carried out to assess the environmental impact of a product during its entire life, from cradle-to-grave. It looks at use of materials, use of energy, impact of transporting the materials and the parts of the product at various points in its life.

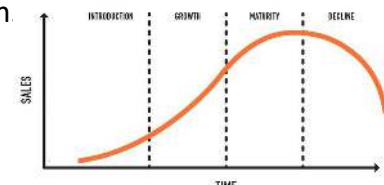


1. Supply Raw Material
2. Transport
3. Manufacture
4. Package
5. Use
6. Disposal

Product Life Cycle

The Product Life Cycle describes the four stages a product goes through from its initial introduction to the market until it is replaced or withdrawn because it is not selling well enough.

1. Introduction
2. Growth
3. Maturity
4. Decline





James Dyson

Key Facts

- Dyson is best known for his dual cyclone technology
- He invented the bagless vacuum prevents poor suction
- The Dyson Air blade dries hands in just 10 seconds and uses
- around 80% less electricity than conventional hand dryers. It has a sheet of unheated air traveling at 400 mph
- He developed the bladeless fan that creates smooth air flow
- He has developed several products using the **latest technology** and at the same time **reducing impact** on the environment by designing them so they use **less energy**.
- Parts to each of his products are easily replaced and fixed so they do not have to be thrown away.



dyson

Philippe Starck

Key Facts

- He is inspired by the organic in order to create technologies better adapted to humans – biomimicry
- He uses sustainable materials in his design
- His designs are made from recycled and re-used plastic
- He uses new technologies in his design
- He sees products as extension of the human body
- He creates products with the perfect balance between design and functionality
- He combines technology and an environmental approach.
- His use of industrial practices to manufacture his products:



STARCK®

Primary Research

Data gathered first hand directly from the client

Secondary Research

Data about the client that comes from a second hand source

Product Analysis

Looking at a product in detail to understand more about it using ACCESS FM

Design Brief

A summary of the design opportunity

Design Specification

A document that lists all the design criteria that the finished product must meet.

Design Development

Involves making a model of a design, which is then tested and evaluated. A new, improved prototype is made and the process is repeated until the finished design meets all the needs and wants of the client.

Testing

To check that the product meets the design specification and the needs of the user.

Evaluation

Where a designer reflects on the design of a product, looks at what went well during testing and identifies ways that a product could be improved.

Key Words and Definitions

Sustainability

The level to which resources can be used without them becoming unavailable in the future.

Carbon Footprint

Carbon foot print is the measurement/amount of greenhouse gases produced in the production of products.

Renewable Energy Source

A source that is quickly replaced by natural means and will not run out.

Non Renewable Energy Source

A source that cannot quickly be replaced and will eventually run out.

FOOD CHOICES

What makes us choose?

Special occasions
Culture
Likes and dislikes
Time of day
Morals
Health conditions
Age
Cost
Religion



Types of vegetarians

Type of vegetarian	Meat	Fish	Dairy	Eggs	Vegetarian alternatives to meat
Vegan	✗	✗	✗	✗	Quorn- cultured fungus
Pescetarian	✗	✓	✓	✓	Soya- soya bean
Lacto	✗	✗	✓	✗	TVP- Textured vegetable protein
Lacto-ovo	✗	✗	✓	✓	Tofu-soya bean curd

- Some people will make food choices based on their religious beliefs
- Hinduism – most avoid beef & related products; some vegetarians; some avoid eggs
- Judaism – kosher; avoid pork & shellfish;
- Islam – halal; avoid pork & related products; no alcohol
- Buddhism – most are vegetarian or vegan; avoid alcohol

Key words

- Kosher
- Halal
- Vegetarian
- Ovo-lacto vegetarian
- Vegan
- Lacto vegetarian
- Ethical
- Diabetes
- Coeliac
- Gluten
- Protein
- Malnutrition
- Lactose intolerance
- Allergy
- Anaphylaxis
- Epi pen



Nutrient Needs of Teens

What is a Vegan diet	eat no animal flesh /meat/fish and poultry and no animal products
What is a lacto vegetarian diet	eat animal produce (Dairy) but not eggs or the flesh of animals/meat/fish/poultry
What is a lacto- <u>ovo</u> vegetarian diet	eat animal produce (Dairy and eggs) but not the flesh of animals/meat/fish/poultry
Why might someone choose to be a vegetarian?	Religious beliefs /Moral beliefs – cruel to kill animals/ Do not like the flavour, texture of meat / Land growing crops can feed many more people than land raising animals / Food scares – BSE, food poisoning, salmonella / Family influence/habits /Peer pressure
What foods can vegetarians get protein from?	Good vegetarian sources are Quorn, Tofu, Soya, Cereals, Pulses, Nuts & Lentils (some may also get this from diary and eggs)
What foods can vegetarians get non- haem Iron from?	Found in pulses, nuts, dried fruit, dark green leafy veg, dark chocolate, cocoa powder, black treacle, curry powder.
What foods can vegetarians get Vitamin B12	Found in yeast extract, marmite and fortified breakfast cereals
Vitamin B12 is needed to:	Needed for energy production, formation of red cells

Nutrient	Reason	Example Foods
Protein	Cope with growth spurts. Boys muscular tissue develops	Omelettes, chicken
Iron	Girls lose iron during menstruation and could become anaemic if not replaced.	Spinach, beef
Vitamin C	<u>Vit</u> C helps absorb iron.	Peppers, strawberries
Calcium	Skeleton grows rapidly. These nutrients helps skeleton reach peak size and bone density.	Milk, yogurt, kale, tofu
Vitamin D		Tuna, salmon, mackerel

Diet related health conditions

Cardiovascular disease (CVD) - This is the general term that describes disease of the heart or its blood vessels. The term includes coronary heart disease and stroke in which arteries carrying blood around the body become blocked with fatty deposits (cholesterol) and consequently blood flow is reduced. CVD is linked to poor diet and lifestyle traits such as obesity, high blood pressure, a diet high in cholesterol and lack of exercise.

To reduce the outcome of CVD it is important to follow dietary guidelines and eat a diet that is low in saturated fat and instead eat foods higher in unsaturated fat such as oily fish, nuts and seeds, olive oil and the recommended 5-a-day of fruit and vegetables.

Diabetes: type 2 - The body may produce too little insulin, or the body has become insulin resistant and cannot utilise the glucose produced by carbohydrates. To help prevent this condition, people should follow the healthy eating guidelines, exercise and maintain a healthy weight. This kind of diabetes usually affects people who are overweight or older. If a person is overweight, they are twice as likely to get type 2 diabetes. Therefore, a high-sugar diet and high-fat diet should be avoided.

Iron deficiency anaemia - Iron is important in making red blood cells, which carry oxygen around the body. Iron deficiency anaemia results in the person affected feeling tired and lethargic because organs and tissues will not get as much oxygen as they need.

Good sources of iron include liver (avoid during pregnancy), eggs, red meat and dried fruit e.g. dried apricots and most dark green leafy vegetables.

Obesity - This is the term to describe a person who is very overweight, with a lot of body fat. It is a common problem in Western society. The method to determine if a person is overweight is to measure their BMI.



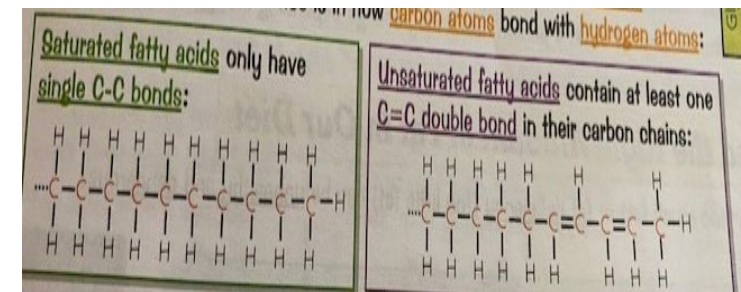
Good Fats vs. Bad Fats



Saturated fat: solid at room temperature, mainly animal foods
sources include:

fatty cuts of beef, pork, and lamb
dark chicken meat and poultry skin
high fat dairy foods (whole milk,
butter, cheese, sour cream, ice
cream), tropical oils (coconut oil,
palm oil, cocoa butter)lard

Unsaturated fats: Liquid at room temperature, vegetable sources, includes mono and polyunsaturated fats.



Food Technology Knowledge Organiser



Making a Roux Sauce

Food Science Topics

Keywords

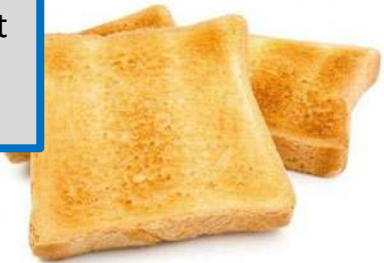
1. Gelatinisation
2. Viscosity
3. Consistency
4. Dextrinisation
5. Caramelisation



Caramelisation: Sugar molecules break down when they reach a high temperature causing the sugar to turn brown and change flavour.

Dextrinisation occurs when starch is exposed to dry heat. Starch in bread, biscuits and cakes with dry heat (toasting/baking) causes the starch molecules to break down to dextrin (brown colour)

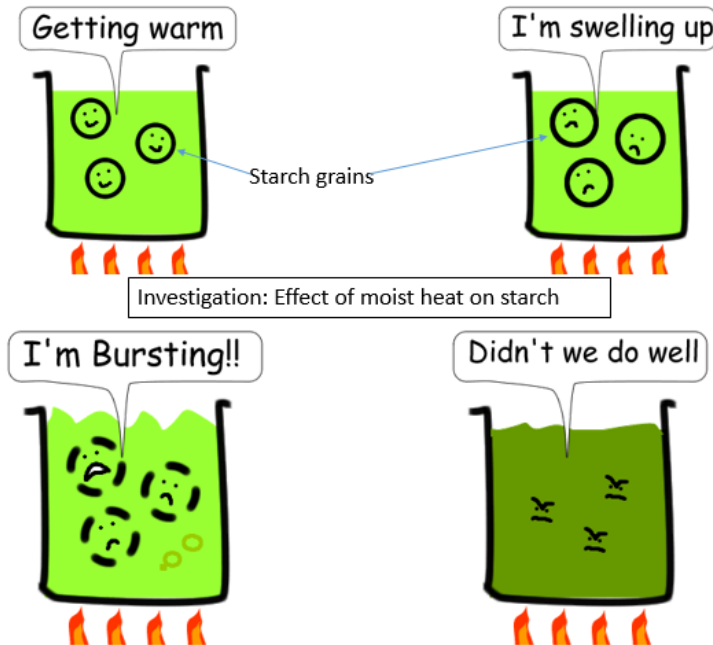
Macro-nutrients (are those nutrients we need in large amounts . They all provide us with energy)



a. The starch grains when **heated** between 62°C and 80°C with the liquid **absorbs the liquid**.

b. As it does so it **swells/expands**.

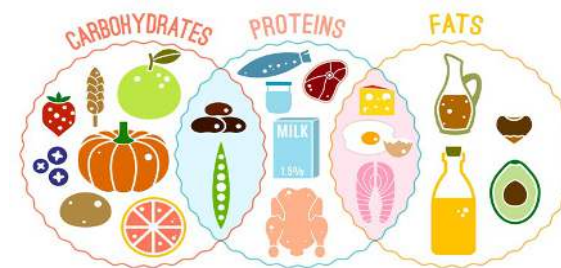
c. When it is no longer able to hold any more liquid the **starch grains burst** to release starch causing the **sauce to thicken**.



Gelatinisation occurs when the starch grains absorb water and ruptures to thicken a sauce or in the cooking of rice and pasta.

Carbohydrates

Starch
Sugars
Dietary fibre



Chemical formula for
glucose : $C_6H_{12}O_6$

Sugars : Monosaccharide
Disaccharide
Polysaccharide

Food Technology Knowledge Organiser



Key Words

BMR: Basal Metabolic Rate is the amount of energy we need to keep our body alive.
Energy balance: the amount of energy we get from food each day is the same as the amount of energy we use each day.

BMI: is a measure that adults and children can use to see if they are a healthy weight for their height.

Energy dense: foods containing high amounts of fat and carbohydrates (especially sugar) e.g. pizza, pastry, chocolate bars, pastries, cakes, cookies, meat products i.e. sausages, burgers salami).

Kilocalorie (kcal)/ kilojoule (Kj): units used to measure energy.

PAL (Physical Activity Level): the amount of energy we use for movement and physical activity every day.

Functions in the body. Everyone needs energy to survive. It allows the body to:

- Move muscles and be physically active
- Produce heat to keep warm
- Send messages to the brain to make nerves work
- Allow the body to grow and develop

Sources:

Carbohydrate: foods containing sugar and starch (1g of carbohydrates = 3.75 /4 kcals of energy)

Fat: foods containing visible and invisible fats and oils. (1g of fat = 9 kcals of energy)

Protein: (1g of protein = 4 kcals of energy)

Physical Activity Level: Regular exercise is an important part of a healthy lifestyle.

Physical activity :

- Reduces risk of developing heart disease, obesity and some cancers.
- Improves health of muscles and skeleton
- Keeps the brain alert and working
- Makes people feel good about themselves.
- Health experts are concerned about the sedentary (inactive) lifestyles due to too much sitting for long periods of time e.g. working at a desk, watching television, using the internet or playing computer games.

The recommended physical activity needed daily is suggested to be:

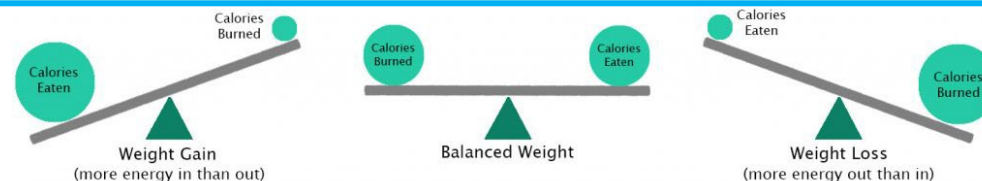
- 5—18 years: aim for an average of at least 60 minutes of moderate intensity physical activity a day across the week
- 19-64 years: aim to do at least 150 minutes of moderate intensity activity a week or 75 minutes of vigorous intensity activity a week.

Energy Balance The amount of energy we take in from food must be used up by our Basal Metabolic Rate and Physical Activity Level.

If we take in more energy from the food we use every day, the energy we do not use will be stored as fat and the body will gain weight.

If we take in less energy from food than we use every day, the energy stored in body fat will need to be used and the body will gradually lose weight.

This is the basis of weight reducing diets.



Amount of energy needed daily by each nutrient:

Carbohydrate: 50%. Most of which should come from starch, intrinsic and milk sugars.

No more than 5% of the energy from carbohydrate should come from free sugars, intrinsic sugar found in fruit and vegetables.

Fat: 35% or less eat less saturated fats.

Protein: 15%

Super Learning Day Knowledge Organiser 9



Be Safe

Challenging Risky Behaviour

A **hazard** is something that can harm you

A **risk** is how likely it is to harm you and how bad that harm would be



Peer Pressure in high school is both harmful and effective because it can lead to teen depression, high stress levels, negative behaviour issues and poor decision-making and outcomes. **Peer pressure** is something that causes conflict in an individual's life

Be Respected

Body image

Appreciate all that your body can do.

Keep a top-ten list of things you like about yourself—things that aren't related to how much you weigh or what you look like

Remind yourself that "true beauty" is not simply skin deep. Beauty is a state of mind, not a state of your body.

Look at yourself as a whole person.

When you see yourself in a mirror or in your mind

Surround yourself with positive people. It is easier to feel good about yourself and your body when you are around others who are supportive and who recognise the importance of liking yourself just as you naturally are.

Shut down those voices in your head that tell you your body is not "right" or that you are a "bad" person. You can overpower those negative thoughts with positive ones.

Do something nice for yourself-- something that lets your body know you appreciate it. Take a bubble bath, make time for a nap, find a peaceful place outside to relax.

Reaching out to other people can help you feel better about yourself

childline

ONLINE, ON THE PHONE, ANYTIME
childline.org.uk | 0800 1111

Careers

Aspirations and role models

Aspirations - hope or ambition of achieving something

Why we need aspirations?

- Drives us to succeed
- Helps us make the right choices – options, college courses, work experience, clubs
- Helps us follow the right paths and put effort in the right places
- Improve life chances
- Gives us direction

Role-model - a person looked up to by others as an example to be imitated.

Be Healthy

How can we manage peer pressure?

Herd behaviour - people and animals tend to do what others around them are doing
"Herd mentality" - something that involves more conscious thought than herd behaviour. This type of mentality can be influenced by things such as peer pressure, conformity, the need for acceptance and the desire for a sense of belonging
"mob mentality" - greater anonymity within a group/ the distribution of responsibility for the group's actions sometimes = can make a person believe they can act a certain way within a group and not have the same consequences

1. Choice of friends
2. Consider the consequences
3. Just say 'no' but you will have to be very strong in that and stick to it
4. Make an excuse and leave (eg feeling unwell, remembered an appointment etc)
5. Agree with a friend that you will both say no.
6. Suggest something else

Be An Active Citizen

How do UK elections work?

Ballot paper - paper on which you mark an X in box next to the name of the person you want to win. Put in **ballot box**.

Candidate - person running in an election

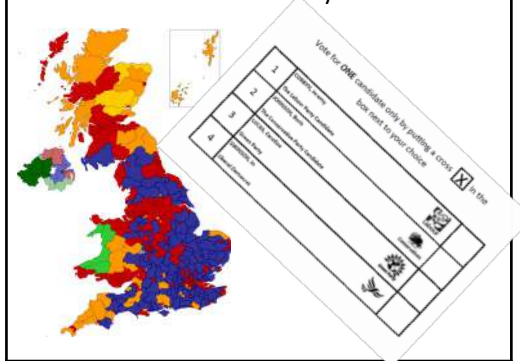
Coalition - when 2 or more parties join together to make a government

Manifesto - declaration of policy and aims

Constituency - area represented by an MP

Electoral register - list of registered voters

First past the post - the candidate with the most votes in a constituency wins.





Super Learning Day Knowledge Organiser 9



Be Safe

Why do people get involved with criminal gangs?

A gang is usually considered to be a group of people who spend time in public places that:

- See themselves (and are seen by others) as a noticeable group
- Engage in criminal activity and violence

How to report gang behaviour and get help:

www.crimestoppers-uk.org

Phone: 0800 555 111

Fearless:

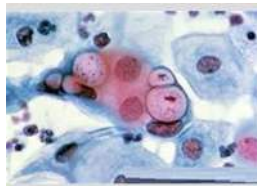
<https://www.fearless.org/en/give-info>

CrimeStoppers.
Speak up. Stay safe.

Be Respected

STIs

Chlamydia is a bacterial infection that usually does not have severe symptoms but can severely damage a woman's reproductive organs and even lead to infertility



Gonorrhea is another bacterial infection symptoms include vaginal discharges and bleeding as well as pain while urinating for women and an unusual discharge and pain during urination for men. Condoms prevent the spread of Gonorrhea. And can be treated with antibiotics

Genital warts are believed to be the most common of all STIs. The human papilloma virus (HPV) causes genital warts, a few types of which can cause cervical cancer in women. There is now an immunisation programme to prevent the virus.

HIV, the human immunodeficiency virus, can be passed via infected blood, semen, vaginal fluid and breast milk

<https://www.nhs.uk/nhs-services/sexual-health-services/guide-to-sexual-health-services/>

Careers

Rights and Responsibilities

Rights at work – this is what you are entitled to expect at work. Many 'rights' are protected by law:

- National Minimum Wage
- Sick Leave and Pay
- Holiday Leave and Pay
- Part-Time Rights
- Maternity Leave

Responsibilities at work – this is what is expected of you in the workplace:

- Follow health and safety rules
- Co-operate and follow instructions
- Fulfil your job duties
- Report absences and injuries

Be Healthy

Managing tough times: change, grief and bereavement

Loss - the experience of not having something or someone that you once had.

Bereavement - the experience of losing a loved one through their death.

Grief - the feelings you experience after the death of a loved one. The feelings of grief and loss can include overwhelming sadness, anger, numbness, guilt, sickness, despair, shock and many more. Many people report a feeling of 'depersonalisation'

The grieving process has four stages: accepting that the loss is real; allowing yourself to feel the pain of the loss; getting used to life without your loved one; finally, moving on with your life

Further help

Talking about how you are feeling with someone that you trust is very helpful. If you need further support you can tell your form tutor, Head of Year or another trusted adult. You can also contact: your GP, Childline (0800 1111), Trafford Talkshop or many other support agencies

Be An Active Citizen

Why do some people become extremists?

Extremism – vocal/active opposition to the norms of society and common shared values including British values such as democracy, the rule of law, mutual respect and tolerance of other faiths and beliefs.

Activism – active participation participates in community to make social/political change to benefit the community as a whole.

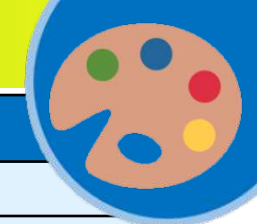
Terrorism - violent action that:

- Endangers a person's life
- Involves serious violence against a person
- Causes serious damage to property
- Creates a serious risk to the public's health and safety Interferes with or seriously disrupts an electronic system.





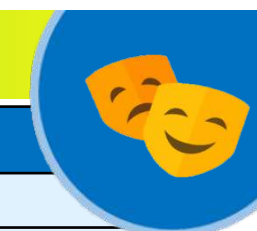
Art – Tier 2 and Tier 3 language



SUMMER: Art	Type	Keyword	Definition
	Tier 2 language	Prototype	An experimental process where the artist implements ideas into a final format.
		Hybrid	A thing made by combining a few different elements.
		Adaptation	The dynamic evolutionary process that fits organisms to their environment.
		Proportion	How the sizes of different parts of a piece of art or design relate to each other.
		Tonal	The range between light and dark or one colour to another.
	Tier 3 language	Rendering	The process of creating the effects of light, shade and light source to achieve contrast in drawings.
		Directional lines	These are drawn lines which follow the form of the subject, giving it a 3D appearance.
		Hatching	An artistic technique used to create tonal or shading effects by drawing closely spaced parallel lines.
		Cross-hatching	When the hatching lines are placed at an angle to one another, it is called cross-hatching.
		Mark Making	The different lines, dots, marks, patterns, and textures we create in an artwork.



Drama – Tier 2 and Tier 3 language



SUMMER: Drama	Type	Keyword	Definition
	Tier 2 language	Posture	The way a character stands or sits
		Plot	The narrative of a story (what happens)
		Interaction	The action or relationship between 2 or more characters
		Mannerisms	Types of behaviours and movements that are specific to a person
		Emphasis	Putting stress on a particular word or phrase within a sentence
	Tier 3 language	Naturalism	Theatre that attempts to create an illusion of reality
		Non-naturalism	Theatre that do not create a life-like representation of everyday life
		Physical Theatre	Theatre focused on using the body to tell a story
		Epic Theatre	Created by Bertolt Brecht. Theatre that makes the audience think critically about what is being performed.
		The Fourth Wall	An imaginary wall that separates the actors from the audience.



Design and Technology – Tier 2 and Tier 3 language



SUMMER: DT	Type	Keyword	Definition
	Tier 2 language	Ecological	Ecological footprint is the impact of a person on the environment, expressed in the amount of land required to sustain use of natural resources.
		Lamination	The process through which two or more flexible packaging webs are joined together using a bonding agent.
		Manufactured	A product produced on a large scale using machinery.
		Composite	A composite material is a combination of two materials with different physical and chemical properties.
		Accuracy	Correct or precise measurements of a product.
	Tier 3 language	Photochromic	Photochromic materials changes colour in response to light intensity changes.
		Thermochromic	Thermochromic material changes colour in response to temperature changes.
		Piezoelectric	Piezoelectric materials are materials that produce an electric current when they are placed under mechanical stress.
		Electroluminescent	Electroluminescent materials (ELs) emit light when an electrical current or voltage is applied to it, or when subject to a strong electric field.
		Geotextiles	Geotextiles are permeable fabrics which, when used in association with soil, have the ability to separate, filter, reinforce, protect, or drain.



Computer Science – Tier 2 and Tier 3 language



SUMMER: Computer Science	Type	Keyword	Definition
	Tier 2 language	Virus	Self-replicating software attached to another program/file.
		Encryption	Mathematically converts data into a form that is unreadable without a key.
		Biometrics	'Password' created from the user fingerprint, iris, retina, facial or voice.
		Authentication	Verifying the identity of a user or process.
		Hacking	Gaining unauthorised access to or control of a computer system.
	Tier 3 language	Malware	A variety of forms of hostile or intrusive software.
		Phishing	Messages designed to steal personal details/money/identity.
		Trojans	Masquerades (pretends) as having a legitimate purpose but actually has malicious intent.
		Shouldering	Directly observing someone enter personal details e.g. PIN number or password.
		Blagging	Inventing a scenario to obtaining personal information.



English - Tier 2 and Tier 3 language



SUMMER 1: ENGLISH	Type	Keyword	Definition
	Tier 2 language	Persuasive	To convince someone about your point of view.
		Facts	A true statement.
		Statistics	A fact using a numerical value.
		Moral	Good or ethical
		Controversial	Something that could be debated.
	Tier 3 language	Anaphora	Repetition of the starts of sentences.
		List of 3	Using three words persuasive in a list.
		Direct address	Using words to like you to address your audience.
		Emotive language	Using words that evoke an emotion in your audience.
		Alliteration	Using the same starting letter for multiple words.

SUMMER 2: ENGLISH	Type	Keyword	Definition
	Tier 2 language		
	Tier 3 language		



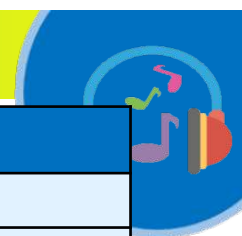
Food technology – Tier 2 and Tier 3 language



SUMMER: Food Technology	Type	Keyword	Definition
	Tier 2 language	Rupture	To break or burst suddenly.
		Absorb	To take in or soak up
		Viscosity	The internal friction of a liquid or its ability to resist flow
		Starch	A polysaccharide which forms a key store of energy in plant cells
		Amino acid	A unit from which proteins are constructed.
	Tier 3 language	Dextrinisation	Breaking up of the starch molecules into smaller groups of glucose molecules when exposed to dry heat, eg toast
		Gelatinisation	When starch granules swell when cooked with liquid, then burst open and release the starch, causing the liquid to thicken
		Roux	A mixture of melted fat and flour that forms the base of a sauce.
		Syneresis	A liquid such as water is expelled or extracted from a gel. E.g. when a gelatinised sauce is frozen then defrosted and it splits.
		Lacto-Ovo	Lacto-ovo-vegetarian diet excludes meat, poultry, and fish but includes eggs and dairy products.



Music – Tier 2 and Tier 3 language



SUMMER: Art	Type	Keyword	Definition
	Tier 2 language	Interval	The distance between two notes e.g. a 4 th , 5 th , 7 th .
		Pedal (note)	A long, sustained note OR a repeated note in the bass line.
		Ominous ending	A tense and worrying ending to the piece created by using a long, low pitched note on solo cello.
		Fanfare	A fancy, brass instrument announcement that something or someone important has arrived.
		Triplets	Three notes that can be played in the space of two.
	Tier 3 language	Leitmotif	A theme for a character, place or item e.g. Luke Skywalker or the Death Star.
		Ritenuato	To gradually slow down.
		Staccato	Notes are played in a short, detached way.
		Dissonance	Clashing harmonies.
		Piccolo	A small flute. Very high pitched.



Geography - Tier 2 and Tier 3 language



SUMMER 1: GEOGRAPHY	Type	Keyword	Definition
	Tier 2 language	Coast	Where the land meets the sea.
		Relief	The height of land above sea level.
		Erosion	The process of wearing away materials.
		Deposition	The process of material being dropped.
		Transportation	The process of material being moved from one location to another.
	Tier 3 language	Swash	Is when waves reach the shore and rush up the beach.
		Backwash	Is the movement of waves down the beach.
		Fetch	How far a wave has travelled
		Discordant	A coastline made of horizontal layers of hard and soft rock.
		Coastal Management	Is a defence against flooding and coastal erosion to protect the coastline.

SUMMER 2: GEOGRAPHY	Type	Keyword	Definition
	Tier 2 language	Industrial Revolution	Is the transition of new manufacturing in the UK.
		Sustainable	To use a resource to meet the needs of now and future generations with limited/no impact on the environment.
		Trade	The action of buying and selling something.
		Renewable energy	Energy that is not depleted when used e.g. wind or solar energy.
		Fossil Fuels	Non renewable resource that is finite (runs out) such as coal and oil.
	Tier 3 language	Urban Regeneration	The renewable and upgrade of an urban area. (Often a former industrial site)
		Urban sprawl	The action of towns and cities into green belt areas.
		Green belt	Is a policy and land-use zone designation used in land-use planning to retain areas of largely undeveloped, wild, or agricultural land surrounding or neighbouring urban areas
		Brownfield site	Relating to urban sites for potential building development that have had previous development on them.
		Urbanisation	The increasing percent of people living in towns and cities.



History - Tier 2 and Tier 3 language



SUM 1: HISTORY: Holocaust and Genocide	Type	Keyword	Definition
	Tier 2 language	De humanisation	To deny the humanity of one group, and associate them with animals or diseases in order to turn people against them.
		Segregation	The action or state of setting someone or something apart from others
		Extermination	Committing mass murder
		Propaganda	Information, especially of a biased or misleading nature, used to promote a political cause or point of view.
		Persecution	Hostility and ill-treatment, on the basis of ethnicity, religion, sexual orientation or political beliefs.
	Tier 3 language	Indoctrination	The process of teaching a person or group to accept a set of beliefs (brainwashing)
		Genocide	The deliberate killing of a large number of people from a particular nation or ethnic group with the aim of destroying that nation or group
		Anti Semitism	Hostility to or prejudice against Jewish people
		Kristallnacht	'Night of broken glass' – an event in which Nazis coordinated an attack on Jewish property and people.
		Ghetto	An area of a city kept separate from others. Jewish people were separated away from others.

SUMMER 2 Civil Rights	Type	Keyword	Definition
	Tier 2 language	Prejudice	To believe people are inferior or superior
		Discrimination	To treat people differently based on prejudice beliefs and stereotypes
		Segregation	The action or state of setting someone or something apart from others
		Mob	A large crowd of people, especially one that is disorderly and intent on causing trouble or violence.
		Boycott	To stop using something as a protest eg the Montgomery Bus Boycott or the Bristol Boycott
	Tier 3 language	Institutionalised Racism	A form of racism expressed in social and political organisations
		Civil Rights Act	1964 law passed in America that made segregation illegal
		Resettlement Allowance	An amount of money to tempt people to leave Britain
		Lynch	To kill without a legal trial, usually by hanging
		Repatriation	To return someone to their country of origin / birth

Maths - Tier 2 and Tier 3 language



SUMMER 1: MATHS	Type	Keyword	Definition
	Tier 2 language	Frequency	How many times something happens. Another word for 'total'
		Proportional	When quantities have the same relative size. In other words they have the same ratio
		Scale factor	How many times larger or smaller an enlarged shape will be.
		Simplify	To make the given expression/fraction/ratio simpler by collecting like terms or cancelling down common factors
		Distribution	How data is shared or spread out
	Tier 3 language	Outlier	A value that "lies outside" (is much smaller or larger than) most of the other values in a set of data.
		Constant of proportionality	The constant value (often written k) relating amounts that rise or fall uniformly together
		Annum	A <u>particular amount</u> <u>per annum</u> <u>means</u> that amount each year
		Discrete data	Data that can only take certain values
		Decimal multiplier	Calculate <i>percentage increases</i> and <i>percentage decreases</i> very quickly, with one single multiplication.

SUMMER 2: MATHS	Type	Keyword	Definition
	Tier 2 language	Expressions	Symbols that represent numbers or operations between numbers
		Simplify	To make the given expression/fraction/ratio simpler by collecting like terms or cancelling down common factors
		Factors	A number that divides another number exactly. E.g. 4 is a factor of 12
		Expanding brackets	Where every term inside each bracket is multiplied by every term all other brackets
		Round	Rounding means making a number simpler but keeping its value close to what it was
	Tier 3 language	Factorise	Putting an expression back into brackets.
		Indices (index)	The index of a number says how many times to use the number in a multiplication
		Significant figures	All the nonzero digits of a number and the zeros that are included between them
		Surds	A number that can't be simplified to remove a square root
		Place value	The value of where a digit is in the number.



MFL - Tier 2 and Tier 3 language



SPRING : MFL: Topic name	Type	Keyword	Definition
	Tier 2 language	Preterite/Perfect (past) tense	talk about completed actions at specific times in the past
		Subordinate clause	has a subject and a verb , but it cannot stand alone as a complete sentence. ... Since the sun will shine today (the sun=subject; will shine=verb)
		Adjectival agreement	the adjective 'agrees' with the noun it's describing in gender and number
		Intensifier/quantifier	to give force or emphasis, for example <i>really</i> in <i>my feet are really cold</i> .
		Sequencers	ords that organize your writing and speaking, words like first , next , then , after that
	Tier 3 language	WWWWW	Who What Where When Why
		TOPCAT	Tenses Opinions Pronouns Conjunctions Adjectival Agreement Translate
		AVOW	Adjective Verb Order of Words
		PALM	People Action Location Mood
		IESAO (fr) SHET (sp)	Il y a - there is Est -is Sont -(They) are A - (he/she/it) has Ont – (they) have Son – (they) are Hay - (there is/ there are) Es ((it) is Tiene) (it) has

SUMMER : MFL: Topic name	Type	Keyword	Definition
	Tier 2 language	Past participle (fr) prepositions (sp)	he form of a verb, typically ending in <i>-ed</i> in English
		Auxillary verb (fr)	verb used in forming the past tense
		Verb ending agreements (être) (fr)	Add an extra –e if feminine, –s if plural and masculine, –es if feminine plural
		Modal verbs	an auxiliary verb that expresses necessity or possibility
		Subordinate Clause	has a subject and a verb , but it cannot stand alone as a complete sentence. ... Since the sun will shine today (the sun=subject; will shine=verb)
	Tier 3 language	SAP SEP (fr)	Subject (person) Avoir (Auxillary verb) Past participle Subject (person) Être (Auxillary verb) Past participle
		IESAO (fr) SHET (sp)	Il y a - there is Est -is Sont -(They) are A - (he/she/it) has Ont – (they) have Son – (they) are Hay - (there is/ there are) Es ((it) is Tiene) (it) has
		TOPCAT	Tenses Opinions Pronouns Conjunctions Adjectival Agreement Translate
		AVOW	Adjective Verb Order of Words
		PALM	People Action Location Mood



Religion and Ethics - Tier 2 and Tier 3 language



SUMMER 1: RE	Type	Keyword	Definition
	Tier 2 language	Prejudice	Pre judging – judging people to be inferior or superior without a cause
		Discrimination	Acts of treating groups of people, or individuals differently, based on prejudice
		Social Justice	Promoting a fair society by challenging injustice and valuing diversity. Ensuring that everyone has equal access to provisions, equal opportunities and rights
		Human Rights	The basic entitlement of all human beings, afforded to them because they are human
		Censorship	The practice of suppressing and limiting access to materials considered offensive or a threat to security. People maybe restricted by censorship laws.
	Tier 3 language	Personal Conviction	Something a person strongly feels of believes in
		Zakah	The third Pillar of Islam, a Muslims duty to give 2.5% of their wealth to charity to support those in need.
		Sadaqah	Islamic term for any good deed done out of compassion or generosity
		Pacifism	The belief and practice of none violence to settle disputes
		Relative poverty	A standard of poverty measured in relation to the standards of society in which a person lives.

SUMMER 2: RE	Type	Keyword	Definition
	Tier 2 language	Responsibility	A duty to care for someone or something
		Environment	The natural world and surrounding someone lives in.
		Evolution	The process of change in which living organisms have developed and adapted to their surroundings
		Quality of life	The general well being of a person. The extent to which life is enjoyable
		Euthanasia	Assisted suicide, helping someone with a terminal illness or someone who is suffering to die
	Tier 3 language	Stewardship / Khalifah	Humans have a duty to care for the earth on behalf of God / Allah as God' Made man in His image'
		Literalist	A Christian who believes the Bible to be the word of God and the exact truth
		Dominion	Dominance or power over something
		Sanctity of Life	The belief that life is a gift from God and should be respected and cared for. Only God can give and end life.
		Creation	The act by which God brought the universe into being



Science - Tier 2 and Tier 3 language



SUMMER 1: SCIENCE	Type	Keyword	Definition
	Tier 2 language	Resistance	When an organism is not affected by a pesticide.
		Competition	The fight to eat, survive and breed.
		Conduction	Heat transfer through solids caused by vibrating particles bumping into each other.
		Conservation	Matter cannot be created or destroyed.
		Vacuum	An area containing no matter.
	Tier 3 language	Eukaryotic	Cells containing a nucleus.
		Domains	The three main groups of life: Bacteria, Archae, Eukarya
		Kinetic	Moving objects.
		Joules	The unit of energy.
		Convection	Heat transfer caused when hot fluids rise because they are less dense.

SUMMER 2: SCIENCE	Type	Keyword	Definition
	Tier 2 language	Frequency	The number of waves that pass a point every second, measured in Hertz.
		Interface	The boundary between two media (mediums) such as air and water.
		Period	The length of time it takes for a single wave to pass.
		Normal	An imaginary line drawn at 90 degrees to where the light hits an interface.
		Fluorescence	Absorbing ultraviolet and re-emitting it as visible light.
	Tier 3 language	Transverse	Waves in which particles oscillate at right angles to the direction of energy movement.
		Longitudinal	Waves in which particles oscillate parallel to the direction of energy movement.
		Incidence	Angle between the incident ray and the normal.
		Ionisation	High energy radiation causes ions to form in our cells, damaging DNA and causing cancer.
		Refraction	The change in direction of light as it moves from one medium to another.