Knowledge Goals Homework Booklet 2 (Autumn Term 2 2024)

Year 9 and 10

Name: _____

Settlebeck SCHOOL

Subject Index

Suggested Homework Schedule
(30 minutes of independent study per subject each week)

	Subjects to Revise	
Monday	Science	Option 2
Tuesday	Mathematics	Option 2
Wednesday	Science	Religious Studies
Thursday	English	Option 3
Friday	Option 3	Mathematics
Saturday	Option 1	English
Sunday	Option 1	Mathematics

To help you get organised, we have planned out your weekly homework slot for each subject.

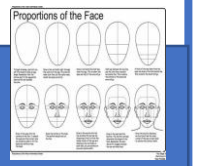
Subject Homework Frequency Information

Subject	Homework
Art	Fortnightly
Computer Science	Fortnightly
Design and Technology	Weekly
Drama	One per half term
English	Weekly
Food Technology	Weekly
French	Weekly
Geography	Weekly
History	Fortnightly
Mathematics	Weekly
Music	Once per half term
PSHE	Once per half term
Physical Education	One per half term
Religious Studies	Weekly
Science	Weekly

HOW TO SELF TEST

Mind mapping

- Mind mapping is simply a diagram to visually represent or outline information.
- Use information gathered from your Knowledge Goals booklet to create mind maps, make sure to use colour and images and keep writing to the bare minimum.



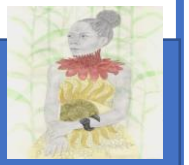
HOW TO MIND MAP VIDEO

Parent information on knowledge retrieval:

Flash cards

Use your Knowledge Goals booklet to make flash cards. Write the questions on one side and on the other record the answer.

Test yourself or work with a friend to make sure you know all of the key information for each topic.



HOW TO FLASH CARD VIDEO

How should students use the Knowledge Goals booklets?

Your **Knowledge Goals** booklet provide the essential knowledge that you need to learn in each subject this half term.

You are expected to spend **30 minutes per subject per week** 'learning' the content.

You will be assessed during lessons using 'low stake' quizzing.

Your teacher may choose to set you additional homework.

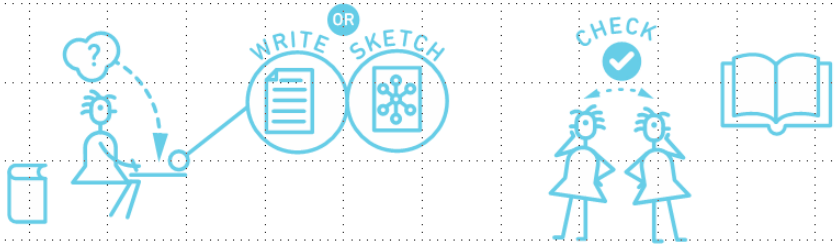
How can parents support?

- Read through the booklet with your child – if you don't understand the content then ask them to explain it to you – 'teaching' you helps them to reinforce their learning.
- Test them regularly on the spellings of key words until they are perfect. Get them to make a glossary (list) of key words with definitions or a list of formulae.
- Read sections out to them, missing out key words or phrases that they have to fill in. Miss out more and more until they are word perfect.

Retrieval Practice

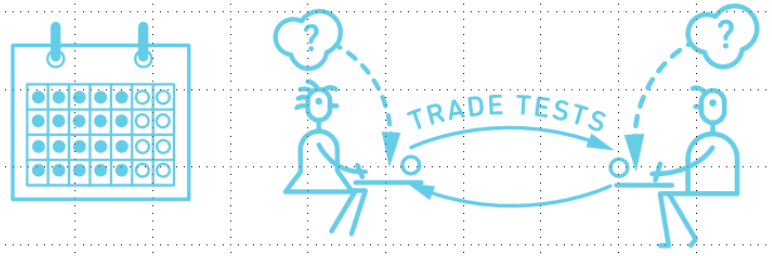
HOW TO DO IT

Put away your class materials, and write or sketch everything you know. Be as thorough as possible. Then, check your class materials for accuracy and important points you missed.



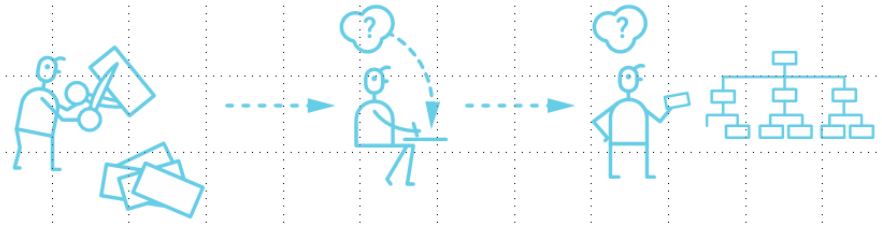
HOW TO DO IT

Take as many practice tests as you can get your hands on. If you don't have ready-made tests, try making your own and trading with a friend who has done the same.



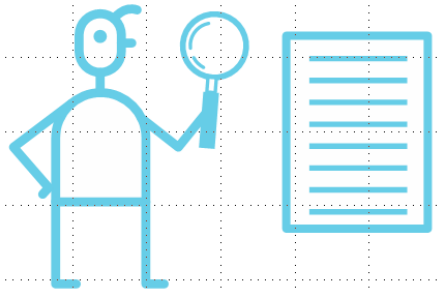
HOW TO DO IT

You can also make flashcards. Just make sure you practice recalling the information on them, and go beyond definitions by thinking of links between ideas.



HOLD ON!

Retrieval practice works best when you go back to check your class materials for accuracy afterward.

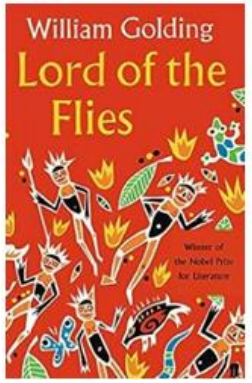


Literacy: Tier 2 Vocabulary

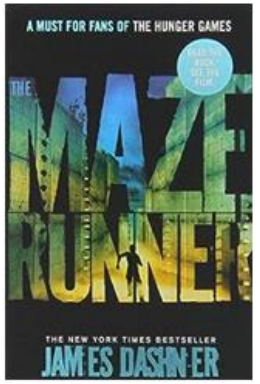
Tier 2 Vocabulary		
	Key word	Definition
1	alleviate	To make easier to endure; lessen; mitigate.
2	benign	Having no harmful influence or effect.
3	compulsory	Required; mandatory; obligatory.
4	deteriorate	To make or become worse or inferior in condition, character, quality, value, etc.
5	encounter	To come upon or meet with, especially unexpectedly.
6	ferocious	Savagely fierce, as a wild beast, person, action, or aspect; violently cruel.

These words are all tier 2 words; in other words, they are seen as 'academic vocabulary' and if you know them, can understand them and use them, you will do better in your exams and be able to communicate more precisely and effectively in life.

DEAL Year 9 (Autumn Term)

Book Title	Author	Genre	Overview	Image
Lord of the Flies	William Golding	Classic	Lord of the Flies is set on a remote island and shows how a group of stranded schoolboys go from civilisation to savagery in a very short space of time. Although their situation at first seems to have the makings of a fun adventure, their fight to survive in their environment and their struggle with each other for power reveals the wickedness which lives inside all of us. Before they are finally rescued there is savagery, destruction, terror and even death.	

British Values					
	Tolerance	Individual Liberty	Rule of Law	Democracy	Mutual respect

Maze Runner	James Dashner	Science Fiction (Dystopian Adventure)	The first three books in the pulse pounding Maze Runner series! When the doors of the lift crank open, the only thing Thomas remembers is his first name. But he's not alone. He's surrounded by boys who welcome him to the Glade - a walled encampment at the centre of a bizarre and terrible stone maze. But the maze is just the beginning ...	

British Values					
	Tolerance	Individual Liberty	Rule of Law	Democracy	Mutual respect

DEAL Year 10 (Autumn Term)

Book Title	Author	Genre	Overview	Image
Hunger Games	Suzanne COllins	Science Fiction (Dystopian Adventure)	The Hunger Games universe is a dystopia set in Panem, a North American country consisting of the wealthy Capitol and 13 districts in varying states of poverty. Every year, children from the first 12 districts are selected via lottery to participate in a compulsory televised battle royale death match called The Hunger Games. The Hunger Games follows 16-year-old Katniss Everdeen, a girl from District 12 who volunteers for the 74th Hunger Games in place of her younger sister Primrose Everdeen. Also selected from District 12 is Peeta Mellark, who once saved Katniss from starvation when they were children. They are mentored by their district's only living victor, Haymitch Abernathy, who won 24 years earlier and has since led a solitary life of alcoholism.	
British Values	Tolerance	Individual Liberty	Rule of Law	Democracy	Mutual respect
All Quiet on the Western Front	Erich Maria Remarque	War Novel	On 1914 a room full of German schoolboys, fresh-faced and idealistic, are goaded by their schoolmaster to troop off to the 'glorious war'. With the fire and patriotism of youth they sign up. What follows is the moving story of a young 'unknown soldier' experiencing the horror and disillusionment of life in the trenches.	
British Values	Tolerance	Individual Liberty	Rule of Law	Democracy	Mutual respect

Year 9 and 10 Knowledge Goals: Still Life

Still Life

Still life art is a genre that focuses on inanimate objects, often arranged in a way that highlights their form, texture, and colour. This art form has a rich history, dating back to ancient civilizations, but it gained prominence during the Renaissance, when artists began to explore the symbolic meanings of everyday objects.
Common subjects include fruit, flowers, household items, and even skulls, each chosen for their aesthetic qualities or deeper meanings.

For GCSE art students, still life provides an excellent opportunity to develop observational skills and experiment with composition, lighting, and colour. You can learn to arrange objects in a way that creates balance and harmony, while also considering the emotional impact of your work.

When creating a still life, you should pay attention to detail and strive to capture the essence of the objects.

Additionally, still life can serve as a foundation for exploring other art movements and styles, making it a valuable subject for budding artists.

Vocabulary

Still Life
Composition
Observation Tone
Weight of line
Cross Hatching
Stippling
Form
Depth

Artist Example

Paul Cézanne, Still Life With Apples and Peaches (1905).

Artist Example

Andy Warhol's Campbell's Soup Cans (1962)

Materials - Examples

Oil Paint	Pencil	Water colour	Charcoal
			

Search | National Gallery, London

Still Life Painting And How It's Survived Thousands Of Years (mymodernmet.com)

Still life | Tate

Still life - Observational drawing - AQA - GCSE Art and Design Revision - AQA - BBC Bitesize

Year 9 and 10 Knowledge Goals: Still Life

Tier 3 Vocabulary		
	Key word	Definition
1	scale	The size of the objects in a still life arrangement. Composition refers to how each of the objects are brought together and arranged.
2	post impressionism	The work or style of a varied group of late 19th-century and early 20th-century artists including Van Gogh, Gauguin, and Cézanne. They reacted against the naturalism of the impressionists to explore colour, line, and form, and the emotional response of the artist.
3	cubism	An early 20th-century style and movement in art, especially painting, in which perspective with a single viewpoint was abandoned and use was made of simple geometric shapes, interlocking planes, and, later, collage.
4	symbolist	A late nineteenth-century movement that advocated the expression of an idea over the realistic description of the natural world.
5	fauvist	Style of painting that flourished in France around the turn of the 20th century. Fauve artists used pure, brilliant colour aggressively applied straight from the paint tubes to create a sense of an explosion on the canvas.
6	composition	Composition is the arrangement of elements within a work of art.
7	ellipse	An ellipse in art is an oval, but the term generally refers to an oval used to represent a titled circle that adds to the impression of depth.
8	observational drawing	Look at the subjects directly in front of your eyes and depict them accurately within a drawing.

Famous Still Life Artists	Art Movement
Van Gogh	Post-Impressionist
Paul Cezanne	Post-Impressionist
Giorgio Morandi	Metaphysical art
Georges Braque	Cubism
Pablo Picasso	Cubism
Paul Gauguin	Symbolist
Henri Matisse	Fauvist

Quiz QR Code	Quiz Link
	Quiz Link

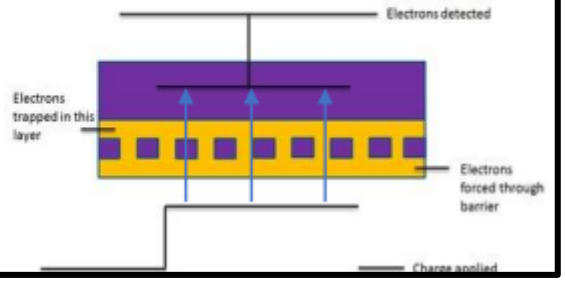
Year 9 and 10 Knowledge Goals: Computer Science

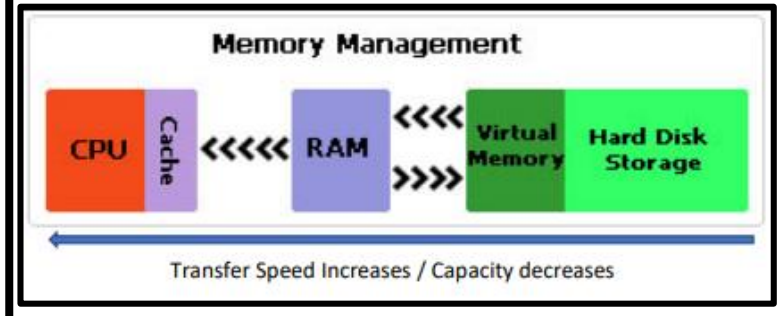
PRIMARY STORAGE - MEMORY

RAM is *volatile* memory, which stores data in a single transistor and capacitor. This means it needs a constantly recycled charge to hold its data. If the power is turned off, it cannot refresh the data and it is lost. This is known as *DYNAMIC* memory. The computer uses RAM to store the current program or data being used.

ROM is non-volatile. The data is hardcoded onto the chip by the manufacturer, and cannot be overwritten by the user. Because it holds its information even when the power is turned off, this makes ROM ideal for storing the instructions needed to get the computer started up – the *BOOT PROCESS, and POST.*

Flash Memory is a new(ish) type of ROM chip which holds its data when there is no power making it *non-volatile* but that can be rewritten easily by the user. By using a relatively large electric current, electrons can be *forced* through a barrier and into the *storage layer*. The pattern of electrons can be read as data without affecting the data.





SECONDARY STORAGE					
TYPE	*CAPACITY*	*COST*	*SPEED*	*Pros*	*Cons*
Magnetic	Very High	Low	Fast	Cheap and readily available. Can have very high storage capacity and is reliable	Slow read and write speeds. Moving parts make it susceptible to damage if moved. Data can be wiped if placed near a magnet
Optical	Low	Very Low	Slow	Cheap. Can be either Read or Read/Write.	Requires an optical drive to be read. Data corruption occurs over time (10+ yrs)
Flash / Solid State	Low	High	Very Fast	Much faster than magnetic drives. No moving parts, so hard to damage by movement. Silent.	Expensive and relatively low capacity. Has limited usable life – about 100,000 rewrites.

SECONDARY STORAGE SPECS		
TYPE	*CAPACITY*	*SPEED*
Magnetic HDD	Terabytes	50-120 MB/s
CD	700 mb	0.146 MB/s
DVD	4.7 gb	1.32 MB/s
Blu-Ray	128 gb	72 MB/s
SD Cards	4-32 gb	50-120 MB/s
USB Drive	Up to 1 tb	45-90 MB/s
Solid State Drive (SSD)	Up to 4 tb but *very* expensive	200-550 MB/s

CONSIDERATIONS WHEN SELECTING SECONDARY STORAGE	
Capacity	How much data will it need to hold?
Speed	How quickly must the data be written / read?
Portability	Does the storage device need to be transported? If yes, then size, shape and weight are important. Will it require other devices to be used (eg. An optical reader).
Durability	How *robust* is the device? Can it be moved without fear of damage? Will it be used in a difficult environment? Does it need to be single use or rewritable?
Reliability	Does it need to be used over and over again without failing, or will it receive minimal reuse? Will it need to store the information for long periods of time?
Cost	Needs to be compared with the above and considered.

Year 9 and 10 Knowledge Goals: Computer Science

Tier 3 Vocabulary		
	Key word	Definition
1	volatile	Memory which requires constant electrical charge. If the power is turned off, then the data is lost.
2	non-volatile	Memory which can retain its data when the power is turned off.
3	RAM	Random Access Memory.
4	ROM	Read-Only Memory .
5	cache	Read-Only Memory Cache Very fast memory, on, or very close to the CPU.
6	virtual memory	A section of the HDD which can be used as RAM for very memory intensive processes.
7	flash memory	A type of dynamic (changeable) ROM.
8	boot process	The instructions needed to start the computer and to initialize the operating system.
9	secondary Storage	Primary storage is RAM. Secondary storage refers to long term, non-volatile data storage.
10	non-volatile	Memory which can retain its data when the power is turned off.
11	magnetic	Data is stored by altering the magnetic charge (+ or -) to represent binary information.
12	optical	A reflective layer or dye is marked to either reflect or not reflect a laser beam. The computer reads the reflections as binary data.
13	solid state	Also known as Flash Memory, the data is stored by forcing (or flashing) electrons through a barrier into a storage layer. Here it is read as binary information

Notes

Year 9 and 10 Knowledge Goals: Computer Science

WHY NETWORK?

There are many reasons to create networks of computers, and increasingly few reasons not to.

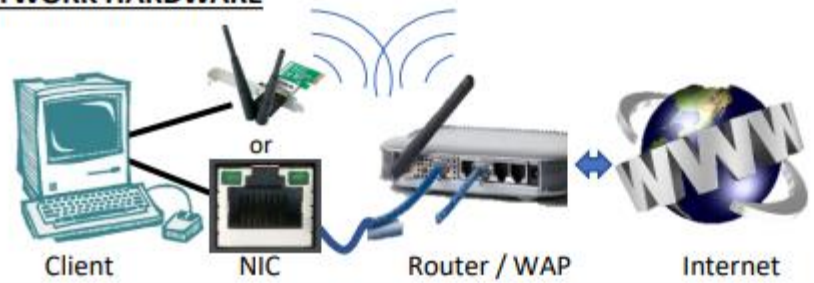
Positives

- Communication between users
- Sharing of files
- Sharing of peripheral devices
- Monitoring user activity
- Access control or other security features
- Centralised administration of machines
- Multiple work stations available for users
- Possible to distribute workload for large tasks

Negatives

- Higher cost than single machines
- Requires additional hardware
- Requires administration
- Open to attacks
- Client-Server systems are vulnerable to server failure

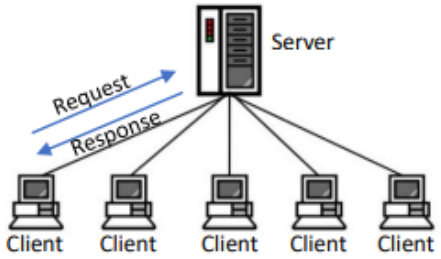
NETWORK HARDWARE



All clients need an NIC to connect to a ROUTER. This could be a wireless adapter or a network card.
The Router in this simple connection can host multiple clients, but more advanced hardware is needed for bigger networks

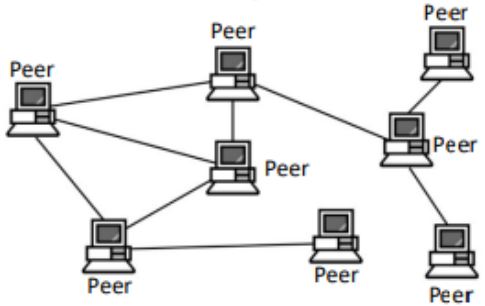
NETWORK ORGANISATION

CLIENT - SERVER



A single high-spec machine is designated the server, which includes the main file storage. Each client then *requests* data from the server which *responds* and fulfills the request.

PEER TO PEER



A *distributed* system where each node is equal. Every computer can serve and request data from all others. The system is easy to set up, but slow and difficult to administer.

TCP/IP Protocol Layers

LAYER 1: Application

This layer ensures data is produced in a form that is acceptable to the application that will use it, such as web-browsers or email clients. This is where IMAP or HTML protocols would be used.

LAYER 2: Transport

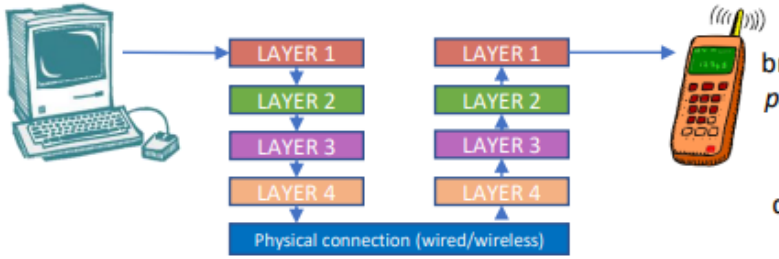
This layer establishes the connection across the network. The transmitting device agrees with the receiving device the speed or data transfer, the size and number of packets and any error checking to be used. This layer uses TCP protocols

LAYER 3: Internet

This layer is concerned with transmitting the data across different networks. It identifies the destination and establishes the path the data will take between nodes. It uses IP protocols

LAYER 4: Network

This layer deals with the physical transmitting of the data. It converts the data into binary electronic signal that can be understood by the network hardware. It uses protocols such as Ethernet or 802.11 (wireless) so the signal is hardware independent and can use any available compliant physical medium, such as UTP or fibre optic wire.

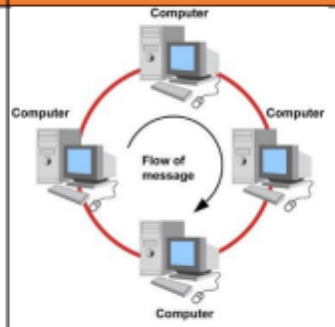
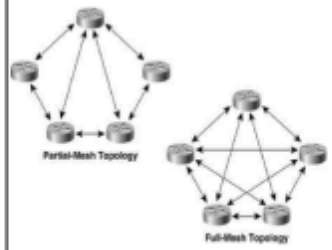
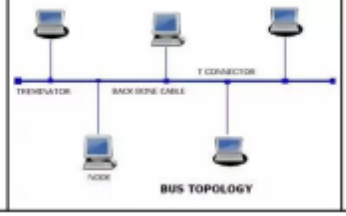


Data transfer occurs by breaking the file into small *packets*, adding each layer to the packet in order at the sending device, then decoding in reverse order at the receiving device before rebuilding the file.

Packet switching is the process that modern networks use to send large data between devices. The data is split into small ***packets*** and numbered. The packets can travel by any route to the destination where the receiving machine reassembles them into the correct order.

Year 9 and 10 Knowledge Goals: Computer Science

Settlebeck School

Topology means "how a network is laid out and the connections between computers"				
NAME	DIAGRAM	DESCRIPTION	ADVANTAGES	DISADVANTAGES
Ring		Each node is connected to 2 others, and packets tend to travel in 1 direction.	All data flow in 1 direction – greatly reduced chance of collisions. No need for network server High speed Additional nodes can be added without affecting performance	All data passes through every workstation on route If 1 node shuts down, then network collapses Hardware is more expensive than switches / NICs
Star		Each node connects to a hub or switch. A central machine acts as **server** whilst the outer nodes are **clients.**	Centralised management through the server Easy to add more machines to the network If 1 machine fails, the others are unaffected	Potentially higher set up costs, especially in server and switch set ups. Central server determines the speed of the network and the number of possible nodes If the server fails then the network fails
Mesh		Every nodes is interconnected with every other, allowing for distributed transmission. Mesh topology can be **FULL MESH** (where every possible connection is made) or **PARTIAL MESH** (at least 2 computers are connected with multiple links)	Multiple devices can transmit data at once, therefore can handle large amounts of data A failure of 1 device does not affect the rest of the network Adding devices does not impact on data transmission between existing devices	Cost is higher due to increased hardware requirements Building and maintaining a mesh network is costly and time consuming The chance of redundant connections is very high, which increases the cost, and makes the network cost inefficient
Bus		Bus or Line topology is a network where all nodes are connected to a single cable (backbone).	Works well with small networks Easiest option for connecting nodes with shared peripherals Least costly in terms of hardware and cabling	Difficult to fault test because who network crashes when there are errors Additional devices slow down the network

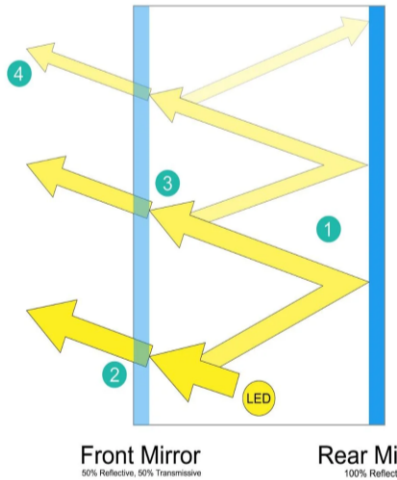
Year 9 and 10 Knowledge Goals: Computer Science

Tier 3 Vocabulary		
	Key word	Definition
1	WAN	Wide Area Network.
2	VPN	Virtual Private Network.
3	Server	The central 'controller' machine on a network, including main data storage.
4	TCP/IP	Transmission Control Protocol / Internet Protocol. These are the standards that allows network nodes to communicate with one another on the internet.
5	Protocol	The rules and standards that are agreed in order to make it possible for different devices to talk to one another.
6	DHCP	Dynamic Host Configuration Protocol – this protocol allows the network server to control the allocation of IP addresses.
7	TCP/IP	Transmission Control Protocol / Internet Protocol. A set of protocols that governs the transfer of data over a network.
8	HTTP	Hyper Text Transfer Protocol - Standards for writing webpages to display content for display.
9	HTTPS	Hyper Text Transfer Protocol Secure - Client-server protocol for requesting (client) and delivering (server) resources, such as HTML, securely.
10	FTP	File Transfer Protocol - Used to directly send files from one node to another over the internet. Commonly used for uploading files to webservers.
11	POP	Post Office Protocol - Used by email clients to download email from the remote email server and save it onto the users computer. More or less redundant now, and has been replaced by IMAP.
12	IMAP	Internet Message Access Protocol - An alternative to POP, allowing more control such as the complete control of remote mailboxes.
13	SMTP	Simple Mail Transfer Protocol - An old standard for transmission of email. SMTP can only be used to push mail to client machines, whilst both POP and IMAP ae used by clients to retrieve mail.

Year 9 and 10 Knowledge Goals: Design and Technology

How does an infinity mirror work?

1. Light bounces back and forth between mirrors.
2. Some light escapes the front mirror each time.
3. Each time light escapes the front mirror, less light is reflected toward the rear mirror.
4. The observer sees the progressively dimmer "illusion LEDs behind the real one.

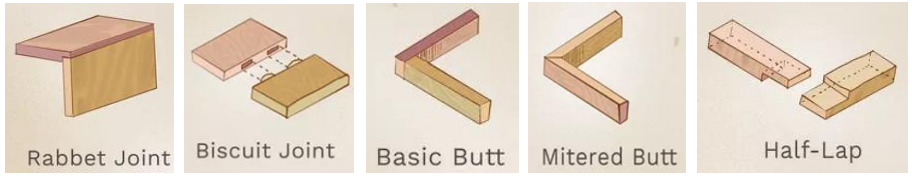


Types of wood

Wood finishes

Paint	
Varnish	
Wax / oil	
Stain	
Shellac	

Wood Joints



Tenon Saw

Tape Measure

Bench hook

2V White LED Strip Light

Soldering iron

Soldering

USB connector

Carpenters square

Year 9 and 10 Knowledge Goals: Design and Technology

Autumn Term: **Tier 3 Vocabulary**		
	Key word	Definition
1	varnish	Varnish can be applied to timber so that a shiny appearance is achieved.
2	shellac	Shellac is a resin secreted by a beetle. Several layers are built by rubbing the polish on to create a finish called French polish.
3	oil/wax	Oil and wax soak into timber and can be used to enhance the natural appearance of the timber.
4	wood stain	Wood stain is applied so that the appearance of the timber is enhanced.
5	paint	Paint gives colour to the timber and can protect the timber if it is going to go outside.
6	reflection	The throwing back by a body or surface of light, heat, or sound without absorbing it.
7	transparent	Allowing light to pass through so that objects behind can be distinctly seen.
8	perpendicular	At an angle of 90° to a given line
9	parallel	Side by side and having the same distance continuously between them.
10	light emitting diode	A semiconductor diode which glows when a voltage is applied.
11	soldering	Join with solder and a soldering iron.
12	USB	A universal serial bus, a standardised technology for attaching peripheral devices to a computer.

Notes

Year 9 and 10 Knowledge Goals: Drama

To Discuss in Detail the Key Information.

1. Plot summary - 2 brothers separated at birth grow up in opposing social classes.
   They reunite at several stages in their life.

2. The play is also a musical, which helps to summarise key plot points in a short space.

3. The themes presented in the play of social class, superstition and violence.

4. The characters in the play and their part to play in the story.

5. The setting on and context of the play.

How would you use the following skills if your were acting in Blood Brothers?

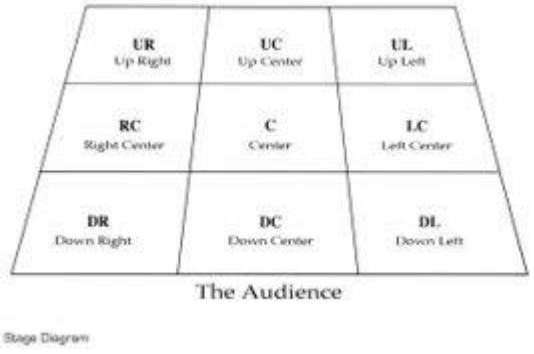
Vocal Skills

- Projection
- Accent
- Volume
- Pitch
- Pace

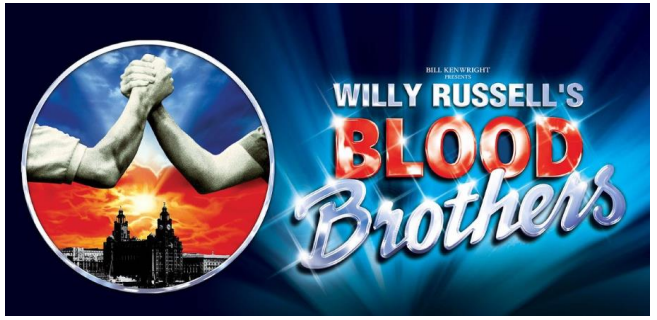
Physical Skills

- Stance
- Posture
- Gait
- Pace
- Use of Stage Space

Stage Positions



Scan QR Codes for more info



Year 9 and 10 Knowledge Goals: Drama

Autumn Term: **Tier 3 Vocabulary**		
	Key word	Definition
1	physical techniques	Drama techniques that use your body or face.
2	facial expressions	A way to show emotions and feelings using your face.
3	body Language	A way to show emotions and feelings using your body.
4	gait	The way you walk
5	stance	The way you stand using your legs and feet.
6	posture	The way you stand using your body.
7	vocal techniques	Drama techniques that use your voice.
8	volume	How loud or quiet your voice is.
9	pitch	How high or low your voice is.
10	tone	A way to show emotion using your voice.
11	intonation	The rise and fall of words and sounds in your voice.
12	projection	How far you can carry your voice.

Notes

Year 9 and 10 Knowledge Goals: English – Science Fiction

Spring Term: **Tier 3 Vocabulary to learn**

	Key word	Definition
1	Genre	A style and category of literature.
2	Murder mystery/ Whodunnit	A story about a murder in which the identity of the murderer is not revealed until the end.
3	A thriller	A story with an exciting plot, typically involving crime.
4	Romance fiction	Fiction with a central love story - usually has a happy, emotionally satisfying ending.
5	Eco fiction	Fiction which explores ecological issues.
6	Cli-fi	Fiction that deals with the impacts of climate change and global warming.
7	Bildungsroman/ a coming of age novel	Fiction which explores the psychological and moral growth of the main protagonist from childhood to adulthood.
8	A sympathetic character	A character who is presented as likeable and who we relate to.

Real life murder mystery:

The writer, Owens - wanted for questioning regarding the killing of a poacher in Zambia

Watch

Delia Owens and Mark Owens | A murder scandal ... - YouTube

Delia Owens (author of "Where the Crawdad Sings"), her husband, Mark, and her stepson, Christopher, are reportedly all still wanted by the Zambian authorities regarding the murder of someone in 1995 who is believed to have been a poacher.

Year 9 and 10 Knowledge Goals: English – Science Fiction

The Owens were American conservationists on a mission to save the elephants from predatory poachers and corrupt African officials. In the 1980s they went to Africa: *firstly* Botswana, and then Zambia. In a book they wrote called *The Eye of the Elephant*, they wrote about their "battles against poachers in Zambia's North Luangwa National Park".

It has been claimed that they moved to Zambia to join an anti-poaching activist group that actually bribed men to train to assassinate elephant poachers

To publicise their efforts to save elephants, they invited an American TV company , ABC, to make a documentary. The documentary, entitled *Deadly Game: The Mark and Delia Owens Story.* made in 1996, purportedly showed the killing of a poacher. It showed a man, already shot, lying on the ground, before being shot again by someone off camera, this time fatally. It is believed that Mark or Christopher Owens fired the final fatal shot.

The Owens claim to have been expelled from Zambia. Why? Because the government did not like these 2 Americans interfering in their country, or did they suspect their practices were illegal?
Or, did the couple themselves choose to flee to avoid being arrested knowing they'd done wrong?

Delia Owens, however, stated that she didn't know anything about the killing, nor did her husband or her stepson. "The only thing Mark ever did was throw firecrackers out of his plane, but just to scare poachers, not to hurt anyone." and she claimed that Chris wasn't there at the time.

1. If Delia Owens was involved in this murder, what does it suggest about her attitude to killing?
2. As you read on, think about if this attitude is reflected in the book in any way?

Year 9 and 10 Knowledge Goals: English – Science Fiction

What inspired Owens to write this novel?

Watch on youtube:
Delia Owens on the inspiration for "Where the Crawdads Sing“

Owens grew up in Thomasville which is in southern Georgia. USA; she has mostly lived in or near true wilderness. She and her husband, Mark, were biology students at the University of Georgia; she received a Bachelor of Science in zoology there and a PhD in animal behaviour from the University of California. She became a wildlife scientist spending 23 years in Africa with her then husband. She wrote 3 non-fiction books with her husband, Mark, then in her late sixties she wrote her first fiction novel, “Where the Crawdad Sings.”

The novel is set in a place she holidayed as a child: North Carolina, and reflects her experiences of being a researcher of animal behaviour. Through this she had learnt what it was like to be isolated and the importance of social groupings and bonding for animals particularly for females.

Watch and read
"Where the Crawdads Sing" author Delia Owens - YouTube
9 Facts About 'Where the Crawdads Sing' - Mental Floss

3. How is her love of the wild reflected in her book?
4. How is her experience of her research in the wild reflected in her book?

Why is the novel called “Where the Crawdad Sings?”

“Where the crawdad sings” is a phrase Delia’s mum used and she has Tate use it in the book. When Kya asks Tate what he means, he explains: **“Just means far in the bush where critters (creatures) are wild”**

5. The phrase refers to a place. What sort of a place?
6. How does this relate to the book?

A crawdad /crayfish - a freshwater crustacean - like a small lobster with an exoskeleton - a hard shell on the outside to support them and protect the softer organs inside

7. How might this be symbolic of Kya?

Year 9 and 10 Knowledge Goals: English – Where the Crawdad Sings: CONTEXT

Settlebeck School

Tier 3 Vocabulary to learn

	Key word	Definition
1	Crawdad crayfish	A creature like a lobster found in freshwater - has an outer shell.
2	Marsh/swamp	Low-lying wet land from rain or tide - typically remains waterlogged.
3	Creek	A narrow, sheltered waterway, an inlet along the coast or channel in a marsh.
4	Flora and fauna	Plants and animals.
5	Shack	A roughly built hut or cabin.
6	Fire tower	A tower from where can watch for fires.
7	White trash	Poor white people – a term used in the southern United States of America.
8	Deprived	Poor, suffering from a lack of things to meet basic needs.
9	Privileged	Having advantages and special rights.
10	Judgemental	Being overly critical.
11	Prejudiced	Making a judgement without good reason, judging them before know them.

Tier 3 Vocabulary to learn

	Key word	Definition
12	Discriminatory	Making or showing an unjust or prejudicial distinction between different categories of people due to ethnicity, sex, age disability.
13	Charitable	Prepared to help those in need.
14	Coroner	A person who holds inquests to find the reasons for sudden, violent, or suspicious deaths.
15	Jury	A group of people sworn to give a verdict/decision on the innocence or guilt of someone based on evidence given in court.
16	Defence	The case presented to prevent a person accused of a crime being found guilty.
17	Attorney	Lawyer.
18	Culpable	Guilty, to blame.
19	Incarceration	Being confined, imprisoned.
20	Nom de plume	A writer's pen name – not their real one.

Year 9 and 10 Knowledge Goals: Victorian Ghost Stories 'The Signalman'

Settlebeck School

CHARLES DICKENS KNOWLEDGE ORGANISER

Overview

Charles Dickens (1812-1870) was a British **writer,** who is often considered to be one of the greatest novelists ever.

He lived during the reign of Queen Victoria, and therefore is known as a **Victorian writer.**

His novels were **very popular** throughout his lifetime, and made him famous. Since his death, his writing has become even more popular.

Some of his most famous novels include **Oliver Twist, Great Expectations,** and **A Christmas Carol.**

His works often **criticised some of the social problems** at the time, for example the gap between rich and poor, child labour, and life for orphans.

A photograph of Charles Dickens c. 1867-1867

Times in His Life

Early Life

-Dickens was born in Landport (Portsmouth) in Hampshire, England, on 7th February 1812.

-He was the 2nd of 8 children to John and Elizabeth Dickens.

-Charles lived an average early life. He was well looked after and had lots of opportunities to play and read books.

Late Childhood

-Things changed for Dickens around the time that he was 11/12.

-His father owed lots of money and was sent to debtors' prison. The young Charles had to work in a boot blacking factory. The conditions were poor and he was badly paid.

Rise to Writing

-Dickens became a clerk in a law office. Although he did not like working there either, he began to write. He was influenced by his experiences in the factory and law office.

-In 1833, Dickens wrote 'A Dinner at Poplar Walls', published monthly. This impressed some critics, and got him a job as a journalist at the House of Commons.

-In 1836, he became a magazine editor. This is the time that he wrote *Oliver Twist.*

Celebrated Author

- From the late 1830s right up until the 1860s, Dickens went on to write a number of hugely popular novels. These included *A Christmas Carol, David Copperfield,* and *Great Expectations.*

-His writing is thought to have made him lots of money, and also made him one of the first worldwide celebrities. His writing was so well-known that the style itself became known as 'Dickensian.' Even characters in his stories, e.g. Ebenezer Scrooge, Bob Cratchit, Fagin and the Artful Dodger have become well-known around the world.

Answers to Important Questions and Key Vocabulary

What did Dickens write about?		-Dickens wrote about lots of different topics, but social inequality was perhaps the subject that he focused on the most. -In the Victorian era in which Dickens lived, the rich lived very different lives to the poor. Whilst they lived in huge mansions and had many servants, the poor often couldn't make ends meet. Children were often made to work in appalling conditions. Dickens wrote about these issues, giving society valuable lessons.
Was Dickens popular during his life?		-Dickens was the most popular author in the western world during his lifetime. He was one of the first people known to be a true celebrity. This allowed him to do book readings and tour America.
What are Dickens' most famous novels?		-Oliver Twist is one of Dickens' best-known novels. It tells the story of a young orphaned boy who is treated exceptionally harshly by others. He has to find his way to happiness through a cruel world. -Another famous Dickens' novel is A Christmas Carol. It is about a miserable man called Ebenezer Scrooge, who only cares about business and money. He is taught a lesson by three Christmas ghosts!
What else do we know about Dickens?		-Dickens was a very superstitious man, who had a number of odd habits. For example, he often slept with his head facing north, as he believed that this would make him write better! -He was a critic of the church. He thought that it used to take advantage of people.

Key Vocabulary

Novelist
Critic
Inequality
Popular
Journalist
Clerk
Debtor
Social
Labour
Victorian
Publication
Dickensian

Top 10 Facts!

1. Charles and his wife, Catherine, had 10 children before they separated.
2. The young Queen Victoria was a fan of Dickens' novels.
3. He is buried in the Poet's Corner of Westminster Abbey.
4. People now think that he probably had OCD (Obsessive Compulsive Disorder).
5. Dickens was interested in the paranormal and joined a group called The Ghost Club.
6. He wrote 15 novels and hundreds of short stories in total.
7. He helped to create a home for women who had fallen on times of hardship.
8. When he died of a stroke in 1870, he had half-written a mystery novel called *'The Mystery of Edwin Drood.'* It remains a mystery.
9. He was involved in a terrible train crash in which many people died, but survived.
10. People across the world celebrated his 200th birthday on 7th February 2012.

Charles Dickens Timeline

- **1812:** Dickens is born in Hampshire, in England.
- **1824:** Dickens' father went to debtors' prison. Aged 12, Charles worked in a factory.
- **1827:** Dickens becomes an office clerk, and begins writing.
- **1833:** Dickens' first work is published – *A Dinner at Poplar Walls.*
- **1836:** Dickens is married to Catherine Hogarth.
- **1837:** *Oliver Twist* is published.
- **1843:** *A Christmas Carol* is published.
- **1853:** He begins doing public readings of his works.
- **1867:** He tours America.
- **1870:** At the age of 58, Dickens dies at his home in Kent.

CHARLES DICKENS

HISTORY CRUNCH www.historycrunch.com/charles-dickens/

BORN FEBRUARY 7, 1812
HAMPSHIRE, ENGLAND

DIED JUNE 9, 1870
KENT, ENGLAND

KNOWN FOR WRITER & SOCIAL CRITIC
'CHRISTMAS CAROL', 'OLIVER TWIST' & MORE

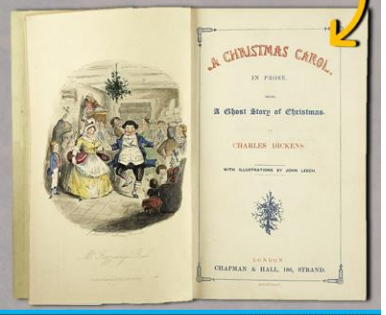
EARLY LIFE 1820s
WORKED IN A FACTORY AS A CHILD
INSPIRED HIS VIEWS ON CHILD LABOR

Later, he worked as a journalist while also publishing his most famous works.

FAMOUS WORKS

'OLIVER TWIST' 1837-1839
'A CHRISTMAS CAROL' 1843
'DAVID COPPERFIELD' 1849-1850
'A TALE OF TWO CITIES' 1859
'GREAT EXPECTATIONS' 1860-1861

A CHRISTMAS CAROL 1843
EBENEZER SCROOGE & THREE GHOSTS
LIFE IN THE INDUSTRIAL REVOLUTION



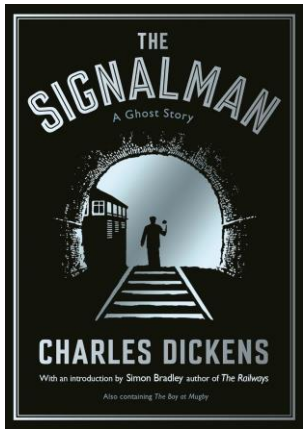
SOCIAL COMMENTARY

His writing offered social commentary on the issues facing industrial England.

POVERTY

CHILD LABOR

Year 9 and 10 Knowledge Goals: Victorian Ghost Stories 'The Signalman'



Key Facts about *The Signalman*
Full title: The Signalman or The Signal-Man
Where written: England
When Published: 1866 in the magazine 'All The Year Round'
Literary Period: Victorian
Genre: Short Story
Setting: A signalman's train station, tunnel, and box
Antagonist: The ghost
Point of View: First Person

Literary Context: Christmas Ghost Stories
Like most longstanding cultural customs, the precise origin of telling ghost stories at the end of the year is unknown, largely because it began as an oral tradition without written records. Spooky storytelling gave people something to do during the long, dark evenings before electricity. However, it was in Victorian England that telling supernatural tales at the end of the year went from an oral tradition to a timely trend. This was in part due to the development of the steam-powered printing press during the Industrial Revolution that made the written word more widely available. This gave Victorians the opportunity to commercialize existing oral ghost stories, turning them into a version they could sell. Higher literacy rates, cheaper printing costs, and more periodicals meant that editors needed to fill pages. Around Christmas time, they figured they could convert the old storytelling tradition to a printed version. People who moved out of their towns and villages and into larger cities still wanted access to the supernatural sagas they heard around the fireplace growing up. Industrialization not only provided tools to distribute spooky stories, uncertainty during the era also fueled interest in the genre. Interest was driven by the rise of industrialization and the looming fall of Victorian Britain as a superpower. All of these things were in people's minds, and made the world seem a little bit darker and a little bit scarier.

Historical Context: The Rise of the Railways
Rail travel was common during the 19th century, and Victorian literature often centred around increased industrialization. While *The Signalman* doesn't explicitly critique industrialization, it was likely inspired by the human cost of industry. On **June 9, 1865,** Charles Dickens survived a rail crash later known as the **Staplehurst rail crash**. His train was derailed due to missing railroad tracks; a man with a red flag waited on the tracks to warn the conductor, but he was standing in the wrong place, and the train didn't have enough time to stop. The crash was fatal, as 10 passengers died and 40 were wounded. Dickens attempted to help his fellow passengers, but some of them died while he was tending to them. Dickens was deeply impacted by the accident, and many believe it prompted him to write *The Signalman*. Dickens avoided train travel whenever possible from that day on, and he died exactly 5 years after the crash. Another inspiration for the story may have been the **Clayton Tunnel rail crash**, which occurred on **August 25, 1861**; a train ran into another train, killing 23 passengers and wounding 176 more. Though Dickens wasn't involved, the accident was famous and his readers would have naturally associated *The Signalman* with it—particularly because a confused signalman caused the Clayton Tunnel crash.

Year 9 and 10 Knowledge Goals: Victorian Ghost Stories 'The Signalman'

Tier 2 Vocabulary		
Word	**Definition**	**Synonyms**
avert	to prevent (something undesirable happening)	to stop
calamity	an event causing sudden damage or distress	a disaster, a catastrophe
fate	the development of events outside a person's control, regarded as predetermined by a supernatural power.	destiny
gesticulate	using gestures instead of speaking or to emphasise your words	gesture, signal, sign, wave
industrialisation	the development of industries on a wide scale	
mortality	the state of being subject to death (mortality rates)	impermanence, transience
portent	a sign or warning that a momentous or terrible event is going to happen	omen, premonition, harbinger
sceptical	not easily convinced, having doubts	cynical, dubious, doubtful
solitary	isolated, lonely, remote	
spectre	a ghost	apparition, phantom, revenant
uncanny	strange or mysterious in an unsettling way	eerie, supernatural
vigilant	keeping careful watch for dangers or difficulties	watchful, observant, attentive

Year 9 and 10 Knowledge Goals: Victorian Ghost Stories ‘The Signalman’

Tier 3 Vocabulary	
Word	**Definition**
adjective	a word describing a noun, such as sweet, red, or tiny
catalyst	an inciting incident that sets the successive conflict into motion
climax	the point in a narrative at which the highest level of interest and emotional response is achieved.
dialogue	communication between two characters; direct speech
foreshadow	a narrative device in which suggestions or warnings about events to come are hinted at.
imagery	the use of literal or figurative language to add symbolism and enable the reader to imagine the world of the piece of literature
in medias res	when a piece of literature starts in the middle of the action, without an introduction
metaphor	a figure of speech that describes an object or action in a way that isn't literally true, but helps explain an idea
narrative structure	the structural framework that underlies the order and way a narrative is presented to a reader
simile	a figure of speech involving the comparison of one thing with another thing of a different kind using the words ‘like’ or ‘as’
symbol	a thing that represents or stands for something else, especially a material object representing something abstract.
tension	the sense that something ominous is right around the corner

Year 9 and 10 Knowledge Goals: Victorian Ghost Stories 'The Signalman'

Settlebeck School

Other great ghost stories to read and enjoy...

M R James
(1895)
'Lost Hearts'

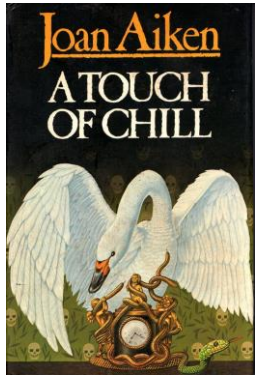
https://theshortstory.co.uk/devsitegkl/wp-content/uploads/2015/08/James-M-R-Lost-Hearts-short-stories.pdf

Mary Elizabeth Braddon
(1879)
'The Shadow in the Corner'

https://www.gothichorrorstories.com/classic-gothic-ghost-stories/the-shadow-in-the-corner/

H G Wells
(1896)
'The Red Room'

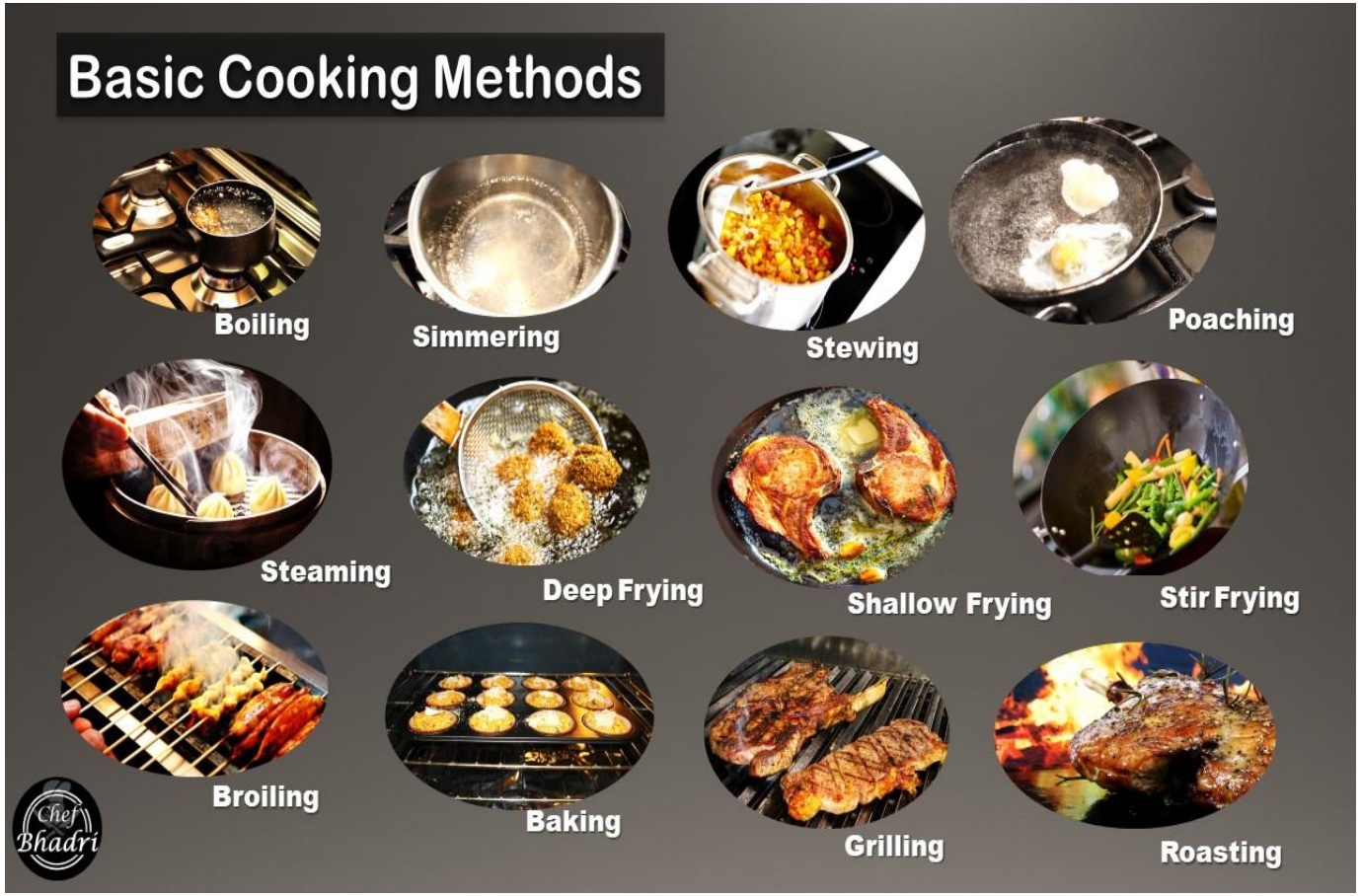
https://www.pdfbooksworld.com/bibi/pre.html?book=487.epub

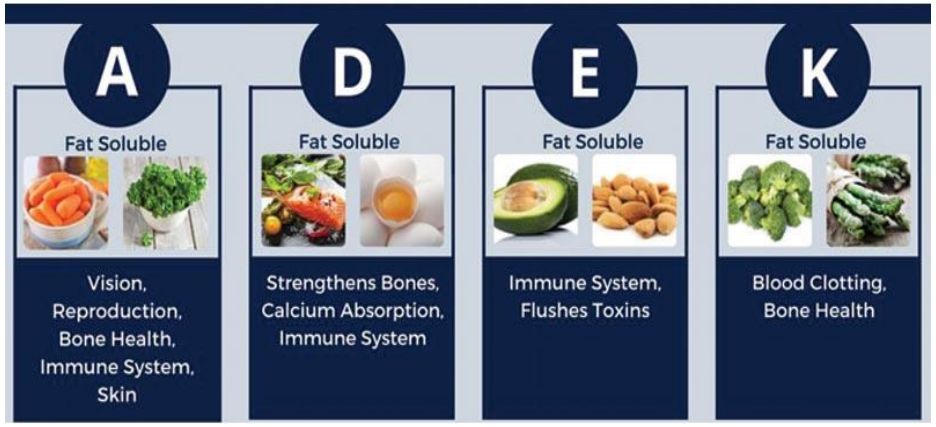


Joan Aiken
(1979)
'Who Goes Down This Dark Road?'

https://www.youtube.com/watch?v=r2h2B7c4HSc

Year 9 and 10 Knowledge Goals: Food Preparation and Nutrition





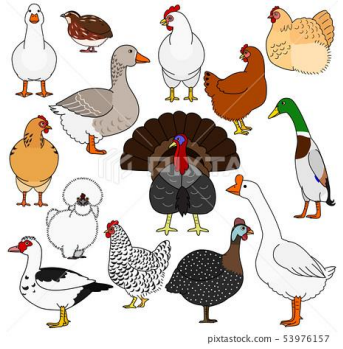
Watch this video on making fresh pasta

SCAN ME

Watch Mrs Warings youtube channel to learn how to portion a chicken

SCAN ME

Types of poultry



Do the benefits of factory farming outweigh the negatives? What do you think?

Year 9 and 10 Knowledge Goals: Food Preparation and Nutrition

Tier 3 Vocabulary		
	Key word	Definition
1	conduction	Where heat is directly touching a food and the heat gives energy to the molecules in the food, which start to vibrate and pass energy to the molecules in the food, which start to vibrate and pass energy and heat through the food to cook.
2	convection	Happens in liquids and gas. The heat gives molecules in the liquid or gas energy, they rise, and colder molecules take their place. This creates convection currents.
3	radiation	Happens in grilling and microwaving, when infra-red waves or microwaves pass through the air and heat the surface of the food, giving the molecules energy.
4	poultry	Poultry are domesticated birds kept by humans for their eggs, their meat or their feathers
5	organic farms	These farms put the Welfare of the animal first and there are certain standards that have to be met.
6	portioning	divide (something) into parts
7	poaching	Poaching is a cooking technique that involves heating food submerged in a liquid, such as water, milk, stock or wine
8	steaming	the process or technique of cooking food by heating it in steam from boiling water.
9	stewing	(with reference to meat, fruit, or other food) cook or be cooked slowly in liquid in a closed dish or pan. "beef stewed in wine
10	braising	fry (food) lightly and then stew it slowly in a closed container.

Notes

Quiz Link

Quiz Link

Common verbs

être = to be

je suis =

il est =

elle est =

on est =

avoir = to have

j'ai

il a =

elle a =

on a =

aller = to go

je vais

il/elle va

on va =

faire = to do

je fais =

il/elle fait =

on fait =

Year 9 and 10 Knowledge Goals: French

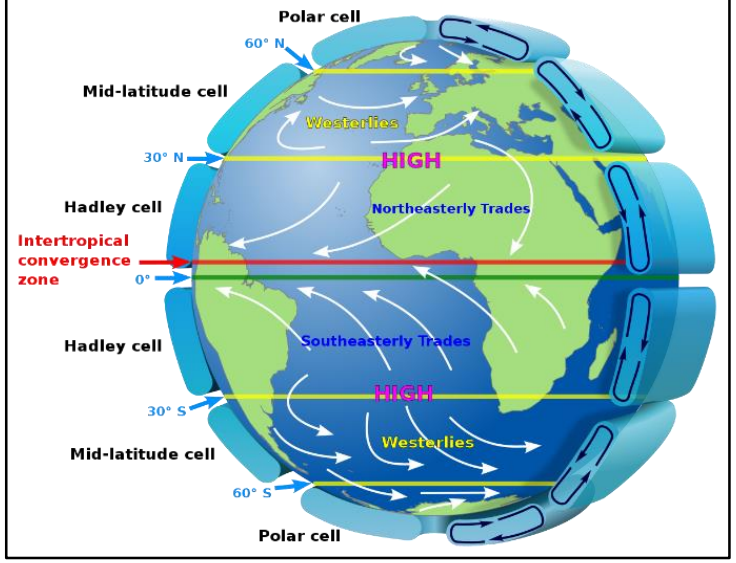
Autumn Term: **Tier 3 Vocabulary**		
	Key word	Definition
1	past participle	The verb in the past tense e.g. **joué**
2	auxiliary verb	The part of **avoir** and **être** used in the past tense
3	time frame	Expression of different tenses
4	establish	Find out
5	false friends	Word that resembles English with different meaning
6	gender	If a word is a feminine or masculine **word**

SCAN ME

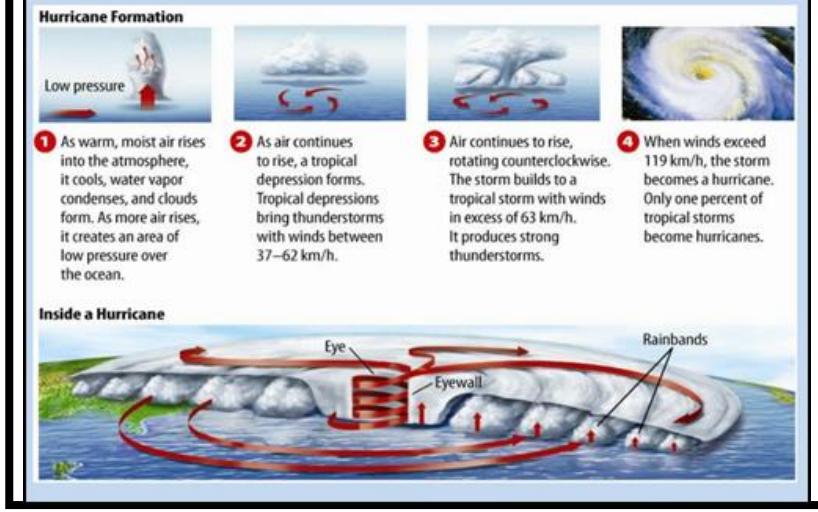
Notes

Year 9 and 10 Knowledge Goals: Geography - Weather Hazards

Atmospheric Circulation



The Formation of a Hurricane



Typhoon Haiyan

Impacts

Economic

The overall economic impact of Typhoon Haiyan is estimated at $5.8 billion (£3.83 billion).
Six million workers lost their sources of income.
Fishing communities were severely affected with the storm destroying 30,000 boats and associated equipment.

Social

More than 7,000 people were killed by Typhoon Haiyan.
1.9 million people were left homeless and more than 6,000,000 displaced.

Environmental

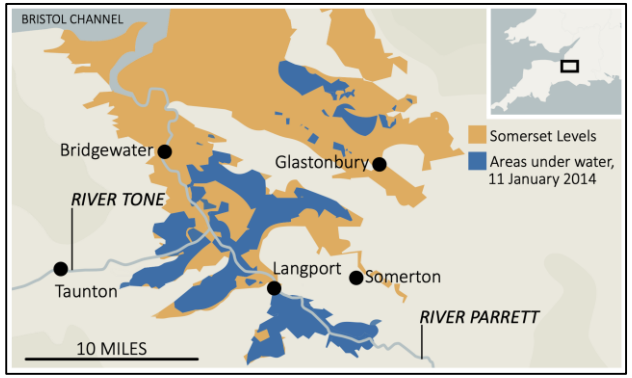
The Philippine government estimated that about 71,000 hectares of farmland was affected.

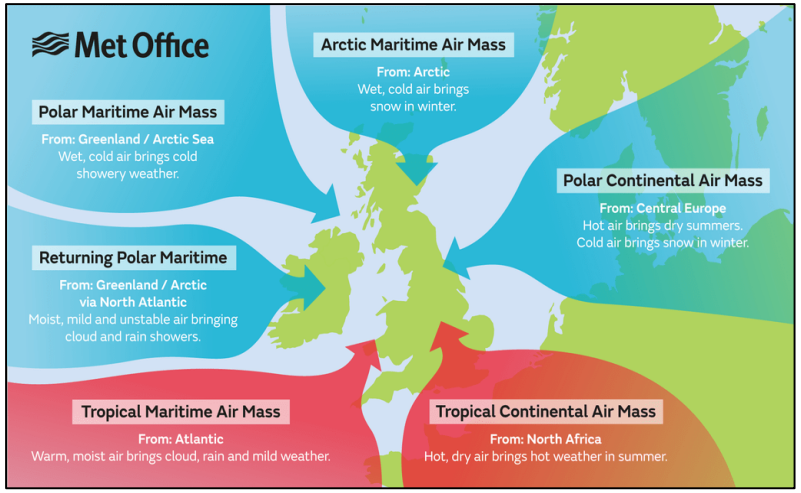
Flooding knocked over Power Barge 103 causing an oil spill affecting mangrove ecosystems.

Typhoon Haiyan

Responses

- Evacuation of approximately 750,000 residents.
- The UK government provided food, shelter, clean water, medicine and other supplies for up to 800,000 victims.
- Several charities provided emergency aid such as water, food and shelter. In the longer term, they helped people get their livelihoods back, for example by repairing fishing boats or distributing rice seeds.
- The United Nations gave £480 million to finance the humanitarian relief effort for 2014.





Somerset levels – Causes

Physical: A quick succession of prolonged Atlantic storms, with persistent rainfall and gale-force winds, was the primary cause of flooding. The rivers could not cope with the significant amount of rain that fell. Additionally, high tides in the Bristol Channel and its narrowing create tidal surges.
Human: There had been less dredging of the river channels on the Somerset Levels leading up to 2014. This reduced the capacity of rivers to transport water, leading to flooding. Change in farming practices has also contributed to flooding

Somerset levels – Impacts

Over 600 homes and 6880 hectares of agricultural land were flooded. In addition, a number of villages were cut off after roads were flooded.
Many main roads were closed. Flooding also disrupted train services on the main Bristol line.
An estimated £1 million was lost by local businesses.
The Somerset floods cost the county's tourism industry an estimated £200 million.
Insurance costs increased in flood-hit areas of Somerset.

Somerset levels – Responses

Rescue boats were used to help stranded people by the fire brigade, who also visited hundreds of properties.
Sixty-five pumps were used to drain 65 million m3 of floodwater.
Local people, led by the Flooding on the Levels Action Group (FLAG), provided local support to the people affected
The government made an estimated £15m to meet the immediate costs associated with protecting lives and properties.

Year 9 and 10 Knowledge Goals: Geography - Weather Hazards

Tier 3 Vocabulary		
Key word		Definition
1	**Global atmospheric circulation**	The worldwide system of winds, which transports heat from tropical to polar latitudes. In each hemisphere, air also circulates through the entire depth of the troposphere which extends up to 15 km.
2	**Tropical storm (hurricane, cyclone, typhoon)**	An area of low pressure with winds moving in a spiral around the calm central point called the eye of the storm. Winds are powerful and rainfall is heavy.
3	**Economic impact**	The effect of an event on the wealth of an area or community.
4	**Environmental impact**	The effect of an event on the landscape and ecology of the surrounding area.
5	**Social impact**	The effect of an event on the lives of people or community.
6	**Immediate responses**	The reaction of people as the disaster happens and in the immediate aftermath.
7	**Long-term responses**	Later reactions that occur in the weeks, months and years after the event.
8	**Extreme weather**	This is when a weather event is significantly different from the average or usual weather pattern, and is especially severe or unseasonal.
9	**Management strategies**	Techniques of controlling, responding to, or dealing with an event.
10	**Eye wall**	The area of extreme low pressure with the strongest wind speeds that surround the eye of the tropical storm.
11	**Rain bands**	Large heavy thunderstorm clouds (cumulonimbus) that have extremely heavy amounts of rain, these surround the tropical storm.
12	**Saffir-Simpson scale**	This scale measures 6the strength of a tropical storm by its wind speed, on a scale of one to five, with five having the strongest wind speed.

Notes:

Quiz QR Code	Quiz Link
	Quiz Link

What you need to know – RENAISSANCE MEDICINE

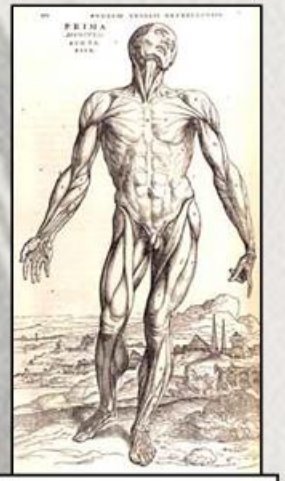
TOP TIP!
Because this is a DEVELOPMENT study you are expected to make comparisons ACROSS time and between each period. Think about HOW themes in medicine have developed or got worse!

Dates to Remember

- 1537 - Andreas Vesalius published his work on Anatomy disproving Galen's ideas about the body
- 1628 - William Harvey wrote that blood circulated around the body
- 1676 – Thomas Sydenham theorised that disease attacked the patient from outside and did not come from within.

What you need to know about RENAISSANCE MEDICINE!

- **ANDREAS VESALIUS** showed that some of Galen's ideas about the body (anatomy) were wrong in his book 'The Fabric of the Human Body'(1543). Vesalius said it was important that doctors dissected human bodies not animals, and that they tested Galen's ideas.
- **AMBROISE PARE** discovered that wounds healed more quickly if boiling oil was not used Instead, he put bandages onto wounds, stopped cauterising (burning them) and developed the idea of TYING OFF THE ARTERIES using silk thread, but because of the problem of germs and infection this would not be used for another 300 years
- **WILLIAM HARVEY** again proved some of Galen's work wrong, e.g. Galen's idea that blood comes from the liver. Harvey showed instead that the HEART pumped blood round the body..
- The RENAISSANCE period was a time of new ideas. People challenged the medieval way of thinking about the world. People discovered new countries, they developed new technology and they challenged the CHURCH. This led to the development of science and education.
- In 1665 the GREAT PLAGUE caused the death of thousands of people in London. They still didn't know what caused it, but did use basic public health measures to try and stop it.
- **THOMAS SYDENHAM** moved medical thinking away from Galen and Hippocrates. He said Disease could be categorised like plants and animals. He also said disease was separate from the patient

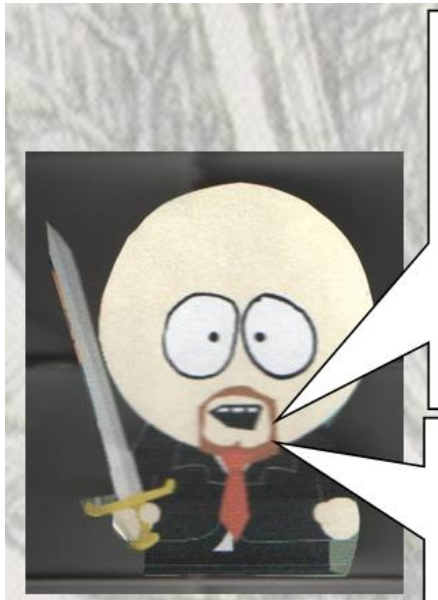


A 3-D picture of the human body, from Vesalius book

If you forget everything else... REMEMBER THIS...

Although there were many new ideas at this time, science and technology had not progressed far enough for them to be useful. People had to continue using old ideas like the Theory of the Four ..

Year 9 and 10 Knowledge Goals: History

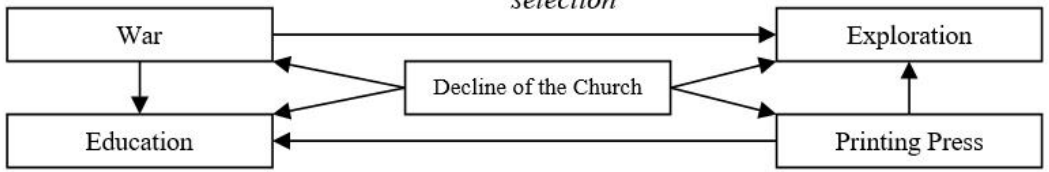


Did Medicine improve between the Medieval and Renaissance period?

✓ People were challenging old ideas about medicine. Experimentation was now important, and herbs from the 'new world' helped develop treatments. Education and technology made medicine more accessible to ordinary people. New art techniques made drawings accurate.

✗ Although knowledge improved, the health of most people did not. People still resisted new discoveries and ideas. Women were still not equal in medicine, herbs were still used, and most people still believed in supernatural causes of disease. Public health did not improve.

DON'T FORGET TO LINK THE FACTORS THAT MADE DEVELOPMENT IN THIS PERIOD POSSIBLE – This shows you are analysing the reasons – Try adding the reasons to the following selection



If you forget everything else... REMEMBER THIS...

Although there were many new ideas at this time, science and technology had not progressed far enough for them to be useful. People had to continue using old ideas like the Theory of the Four ..

KEY TERMS

THE ROYAL SOCIETY – was set up in 1660 to PROMOTE science, share ideas and carry out experiments. It helped the spread of medical knowledge
TRANSFERENCE – when an illness is transferred to something else
PEST HOUSES - were used as part of hospital care to care for those suffering from small pox or plague. The isolated patients from the healthy
CHEMICAL CURES – Medical chemists experimented with the use of metals in the treatment of disease. E.g. mercury
FUGITIVE SHEETS – were individual pages from a medical textbook
NEW WORLD – this was the age of exploration. Columbus discovered the Americas at this time. Many new treatments came from the herbs from the new world
COMMUNITY CARE – most people continued to be cared for at home

Year 9 and 10 Knowledge Goals: Mathematics

What you need to know:

Collecting like terms

Simplify the expression: **4w + 3 + 2w - 1**

4w + 3 + 2w – 1 (Now Group Like Terms)

= 4w + 2w + 3 – 1 (Combine Like Terms)

= 6w + 2

= **6w + 2** ✓

$4x^2 + 3xy - 14x + 7xy + x^2$

$4x^2$ + $3xy$ − $14x$ + $7xy$ + x^2

$5x^2 + 10xy - 14x$

Note – you can only collect terms that have the same power eg $5x + 4x^2 \neq 9x^2$

Substitution

Evaluate (find the value of) the expressions, given that:

$a = 2, \quad b = 3, \quad c = -5$

Note – Always use the correct order of operations

1. $4b = 4 \times 2 = 8$
2. $7b - 3c = (7 \times 3) - (3 \times -5) = 21 - -15 = 21 + 15 = 36$
3. $5b^2 + 1 = 5 \times (3)^2 + 1 = 5 \times 9 + 1 = 45 + 1 = 46$
4. $2c^3 = 2 \times (-5)^3 = 2 \times -125 = -250$
5. $\frac{3ac}{2b} = \frac{3 \times 2 \times -5}{2 \times 3} = \frac{-30}{6} = -5$

For fractions work out the numerator and denominator separately first

Linear expressions

Expand and simplify where appropriate

1) 7 (3 + a) = 21 + 7a

2) 2(5 + a) + 3(2 + a) = 10 + 2a + 6 + 3a
= 5a + 16

Note – collect like terms to simplify

3) Factorise $9x + 18 = 9(x + 2)$

4) Factorise $6e^2 - 3e = 3e(2e - 1)$

Note – to 'factorise fully' means take out the HCF.

Quadratic expressions

Expand and simplify:

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

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

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

2) $(p + 2)^2$

$(p + 2)\ (p + 2)$

$= p^2 + 2p + 2p + 4$

$= p^2 + 4p + 4$

Factorise:

3) $x^2 - 2x - 3$

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

Factorise and solve:

4) $x^2 + 4x - 5 = 0$

$(x - 1)(x + 5) = 0$

Therefore the solutions are:

Either $(x - 1) = 0$

$x = 1$

Or $(x + 5) = 0$

$x = -5$

Year 9 and 10 Knowledge Goals: Mathematics

Index Laws

Simplify the following: $a^3 \times a^4$

If we start by writing it out in full:

$a^3 = a \times a \times a$

$a^4 = a \times a \times a \times a$

$\therefore a \times a \times a \times a \times a \times a \times a = a^7$

To multiply together two identical values or variables (letters) that are presented in index form, add the powers.

$d^8 \times d^2 = d^{10}$ $\quad e^{-3} \times e^5 = e^2$ $\quad f \times f^3 = f^4$

Simplify the following:

$\frac{m^5}{m^3}$

If we start by writing it out in full:

$m^5 = m \times m \times m \times m \times m$

$m^3 = m \times m \times m \times m \times m$

$\therefore \frac{m \times m \times m \times m \times m}{m \times m \times m} = m^2$

$p^6 \div p^3 = p^3$ $\quad \frac{s^3}{s^7} = s^{-4}$

To divide two identical values or variables (letters) that are presented in index form, subtract the powers

Simplify the following:

$(m^7)^3 = m^{21}$ $\quad (n^6)^{-4} = n^{-24}$

To raise a value or variable (letter) presented in index form to another index, multiply the powers together

Reminders:

$a^1 = a$

$a^0 = 1$

Difference of two squares

$a^2 - b^2 = (a + b)(a - b)$

Index Laws - Negative

$a^{\frac{1}{2}} = \sqrt{a}$ $\quad a^{-m} = \frac{1}{a^m}$

$9^{\frac{1}{2}} = \sqrt{9} = 3 \text{ or } -3$

$64^{\frac{2}{3}} = (\sqrt[3]{64})^2 = 4^2 = 16$

$7^{-1} = \frac{1}{7}$

$8^{-4} = \frac{1}{8^4} = \frac{1}{4096}$

Solving Equations

Unknown on one side

Solve 2x + 1 = 9

-1 / -1

2x = 8

÷2 / ÷2

x = 4

Solve 3(y – 7) = 9

Always expand the bracket first

3y – 21 = 9

+21 / +21

3y = 30

÷3 / ÷3

y = 10

You can check your answers by substituting your answer back into the question

Unknowns on both side

Solve 2d - 7 = 5d - 10

Start by subtracting the smallest amount of the variable from both sides

-2d / -2d

-7 = 3d - 10

+10 / +10

3 = 3d

÷3 / ÷3

d = 1

Solve 3(2t + 4) = 2(2 - t)

6t + 12 = 4 – 2t

+2t / +2t

8t + 12 = 4

-12 / -12

8t = -8

÷8 / ÷8

t = -1

Year 9 and 10 Knowledge Goals: Mathematics

Rearranging Formulae

Change the order of the terms so 'u' is on its own

Make u the subject: $v = u + at$

-at -at

$v - at = u$

so $u = v - at$

Make m the subject: $I = mv - mu$

If the letter appears twice you will need to factorise

$I = m(v - u)$

÷ $(v - u)$ ÷ $(v - u)$

$I \div (v - u) = m$

$$m = \frac{I}{v - u}$$

Iteration

Starting with $x_0 = 0$ use the iteration formula

$$x_{n+1} = \frac{2}{x_n^2 + 3}$$

3 times to find an estimate to the solution.

Calculate the values of x_1, x_2, x_3 to find an estimate for the solution to $x^3 + 3x = 2$

$$x_{0+1} = \frac{2}{0^2 + 3} = 0.\dot{6}$$

We substitute this value into the next step.

$$x_{1+1} = \frac{2}{0.\dot{6}^2 + 3} = 0.5806451613$$

$$x_{2+1} = \frac{2}{(0.58\ldots)^2 + 3} = 0.5993140006$$

An estimate of the solution is 0.6 because all of the solutions round to 1d.p.

Year 9 and 10 Knowledge Goals: Mathematics

Tier 3 Vocabulary		
	Key word	Definition
1	formula	expresses the relationship between two or more unknown values.
2	expression	A sentence in algebra that does NOT have an equals sign.
3	identity	One side is the equivalent to the other side.
4	substitution	Replace the letter with a given value.
5	like terms	Variables that are the same are ‘like’.
6	expand	Single brackets – each term inside the bracket is multiplied by the term outside the bracket. Double brackets – each term in the first bracket is multiplied by all the terms in the second bracket.
7	factorise	Putting an expression back into brackets.
8	equations	A sentence in algebra that includes an equals sign.
9	inverse	The opposite operation.

Notes

Year 9 and 10 Knowledge Goals: Media Studies

Print Advert Conventions

Structural Features of Adverts

Copy
The written explanation of the product. Analysis based on what it says, placement of text, font type and size, colour

Headline
An advertising headline is designed to be the first copy the potential customer reads. It should grab the attention of the reader

Subheading
The subheading usually spells out or elaborates the promise made in the headline but is not alway present

Slogan
It is a phrase that describes the benefit of the product the product's most important attributes. The term slogan comes from the Gaelic words sluagh gairm, meaning battle cry

Logo
A symbol or other small design adopted by an organisation to identify its products. It is very carefully designed and will feature on all adverts and the products themselves.

Central Image
The main (biggest) image on the advert. It will often be striking in order to grab the attention of the consumer.

Typography
The particular style of font used on the advert and helps to create brand identity - the same style will be used on all advertising

Brand Identity
How a business wants to be perceived by. Components of the brand (name, logo, tone, tagline, typography) are created by the business to reflect the value the company and to appeal to its customers.

Other Key terms/ ideas

Propp
Vladimir Propp did research into the typical characters you would find in all narratives and what roles/ functions they had.

Lines of appeal
Advertiser will try to convince us to buy things by appealing to our fears and desires eg wealth, happiness, success

Superlatives
These are adjectives that express a high degree of quality or are exaggerated expression of praise.

Patriarchal
A system of society or government controlled by men, where the views and ideas of men are favoured.

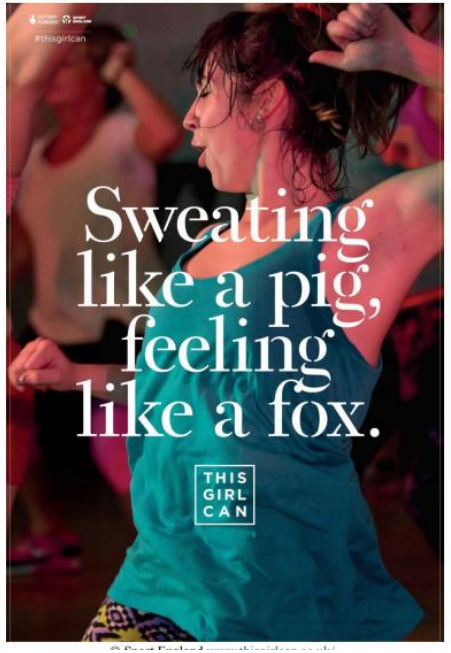
Composition

Z Line composition constructs advertisements based on the theory that people will scan images from left to right and, to a lesser extent, top to bottom.

Rule of Thirds: imagine breaking an image down into thirds (both horizontally and vertically). If you place points of interests along the lines or intersection the image will be pleasing

Use of primary colours: these will attract attention and they have positive connotations. According to Psychology we will all have similar responces to these colours

Triangular composition is a way of organising elements/ images. It portrays feelings (simplicity/completeness) and is one of the most common compositional arrangements.



Quality Street
(1956)

Mackintosh

Links to Regency Era

Commercial product

Upholding stereotypes

This Girl Can
(2016)

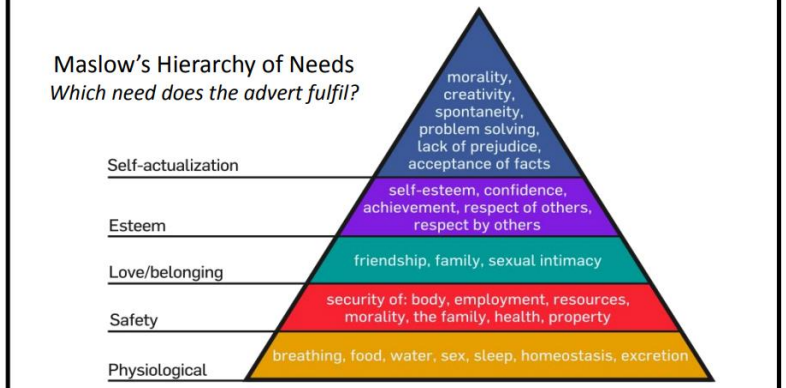
Sport England

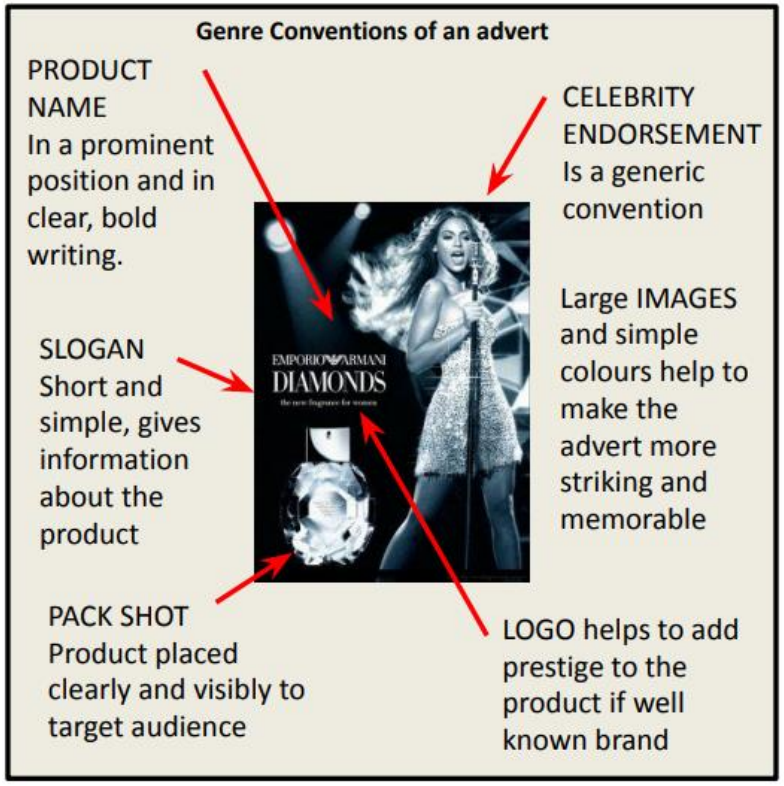
National Lottery

Non-commercial

Women and Sport

Subverting stereotypes





Year 9 and 10 Knowledge Goals: Media Studies

Autumn Term: **Tier 3 Vocabulary (General)**		
Key word		Definition
1	denotation	The literal meaning of a sign or symbol.
2	connotation	The associations of a sign or symbol.
3	polysemic	When a sign or symbol has various connotations.
4	anchorage	The way in which written text is used to secure the meaning of an image (e.g. caption)
5	copy	The written text in a printed publication.
6	mise-en-scene	The visual codes or elements in a media product.
7	narrative	How the events in a story are ordered and told.
8	genre	A type of media form or product.
9	conventions	Elements that we would expect to see in a particular genre.
10	mediation	The way in which media producers construct and re-present versions of reality to audiences.
11	stereotype	An oversimplified image of a particular type of person or social group.
12	target audience	The group that a product is intended for.

Autumn Term: **Tier 3 Vocabulary (Advertising)**		
Key word		Definition
1	house style	The consistent use of colour, design, typeface and language to create a clear brand identity.
2	brand identity	The image of a particular product or company and the values associated with it.
3	consumer goods	Physical products for purchasing such as food, cars etc.
4	masthead	The name of the newspaper or magazine.
5	typography	The style and size of font used in a media text.
6	slogan	A short punchy phrase that communicates key ideas about a product or issue.
7	logo	A simple design that makes a product recognisable and communicates information about the product or brand identity.
8	lines of appeal	Images or references used by advertisers to tap into our desires and fears.
9	unique selling point	USP – something that makes a product stand out from competitors' similar products.
10	aspiration	The desire for a higher level of success or material wealth.
11	hard sell	An advertising hard sell will feature a product or issue prominently and there is a clear and direct message.
12	soft sell	In a soft sell, the product is less prominent, but an ideal lifestyle is created to push the product.

Year 9 and 10 Knowledge Goals: Music

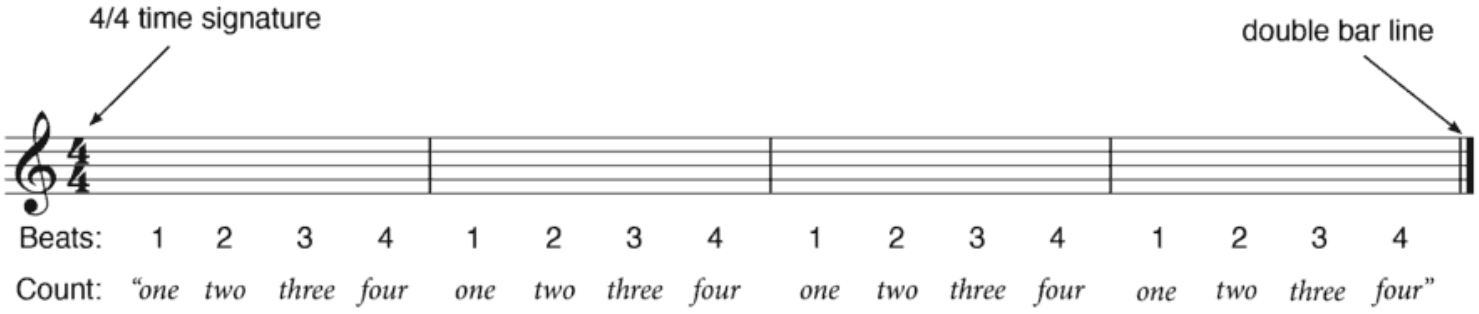
Understanding Rhythms

1. Each musical note has a name and a 'value'; this is the duration of the note, or how many beats it lasts for.
2. Notated music is divided into sections called 'bars'.
3. The time signature of 4/4 means there are 4 beats in every bar of music.
4. Notes with different values can go into each bar, but if the time signature is 4/4 then the total value of notes must be exactly 4.
5. Putting different note values together into bars will create **rhythms**.
6. You can play rhythms on pitched or unpitched instruments.

Note Value

Notes	Name		Value
	Semibreve	Whole note	4 beats
	Minim	Half note	2 beats
	Crotchet	Quarter note	1 beat
	Quaver	Eighth note	½ beat
	Semi-quaver	Sixteenth note	¼ beat
	2 Quavers	2 Eighth notes	1 beat
	4 Semi-quavers	4 Sixteenth notes	1 beat

4/4 Time Signature on Notated Music



Year 9 and 10 Knowledge Goals: Music

Tier 3 Vocabulary		
	Key word	Definition
1	tempo	The speed of the music
2	rhythm	A pattern of musical note values.
3	pitch	How high or low a note is.
4	unpitched	An instrument whose sound stays the same e.g. a drum
5	duration	The length of a note.
6	semibreve	A note lasting 4 beats
7	minim	A note lasting 2 beats
8	crotchet	A note lasting 1 beat
9	quaver	A note lasting ½ beat
10	semi-quaver	A note lasting ¼ beat
11	time signature	How many beats in a bar

Notes

Year 9 and 10 Knowledge Goals: Physical Education

Invasion Games

1. **Invasion games** are team games in which you try to attack the other teams space.
2. There is normally two teams and two goals. The aim is to try and score the most goals in a set time period.
3. Success in invasion games is about;

- Using the space available for you.
- Passing to teammates in a better position than you.
- Moving into space or creating space for your teammates.
- Marking your opponents.

1. You should begin to learn the **rules and regulations** of this term's invasion games: Football, Netball & Hockey.
2. Good **sportsmanship** is fair and generous behavior or treatment towards others in a sporting context.
3. The roles of different **officials** within the listed sports for this term.
4. Learn the skills of invasion games and transfer them to over sports.

Invasion Games – Autumn Term Focus Sports Star

Football	Netball	Hockey
Georgia Stanway- **Born in Barrow**	**Helen Housby** **Born in Carlisle**	**Fiona Crackles-** **Born in Kirkby Lonsdale**
		
Positions: Attacking midfielder First National team- England U15'S 2014 UEFA Women's Championships 2022- Winners	**Positions:** GA & WA First senior international **Debut:** 2015 Netball world cup 2019- Bronze Won BBC sporting moment of the year- 2019 Commonwealth games 2018- Gold	**Position:** Defender First senior international **Debut**: 2020 Olympic 2020- Bronze Captained England's U18 team to bronze in the EuroHockey Youth Championships- 2018

Football: Sedbergh wanderers	**Football**: Kendal United	**Netball**: Kirkby Lonsdale	**Hockey**: Kendal

Year 9 and 10 Knowledge Goals: Physical Education

Autumn Term: **Tier 3 Vocabulary**		
	Key word	Definition
1	agility	The ability to move and change direction quickly whilst maintaining control.
2	passing	To give the ball to another member of your team using power whilst maintaining accuracy.
3	receiving	Take possession of the ball from a teammate.
4	intercepting	To gain possession of the ball during a pass by the opposition.
5	defending	Protect your goal/area. Stop the other team from scoring.
6	attacking	To try and score a goal/point in the other teams area.
7	coordination	The ability to use different parts of the body together smoothly and efficiently.
8	creating space	To pull a defender away to create a open area for a team-mate to move though to pass the ball into.
9	set plays	Pre-designed movements used by a team when the ball is put into play.
10	maintain possession	When the team in attack has control of the ball.
11	cardiovascular endurance	The ability of the heart, lungs and blood vessels to get oxygen to the muscles and the ability of the body to use the oxygen.
12	teamwork	Collaborative effort of a group to achieve a goal in the most effective and efficient way.

Notes

Year 9 and 10 Knowledge Goals: Religious Studies

Buddhism - key teachings for issues around life

1st precept:

'Abstain from killing or harming any living thing'

Metta:

A loving kindness

Wheel of life:

Life is made up of birth, life, suffering, death and re-birth.

Dependent arising:

We are dependent on nature, and nature is dependent on us, if we look after nature, nature will look after us

Christianity - key teachings for issues around life

Sanctity of life:

We are made in Gods image. Only god can give life, only God can take it away.

Genesis 1:1

The world was created in 7 days, by God, the creator.

Stewardship:

God gave us the earth and all life in it to take care of it.

Dominion:

God gave us Earth and all life in it to use.

Abortion

The process whereby the pregnant mother chooses to stop the pregnancy, via a variety of methods. It is illegal in the UK after 21 weeks, except under specific circumstances.

Christian view point:

Sanctity of Life -all life is sacred, only God can take it away

Buddhist viewpoint:

Only if the mother may come to harm, otherwise it goes against the first precept.

Use of animals

For food, transport, entertainment and experiments.

Animals for experimentation include for medication and for cosmetics.

Animal experimentation:

Buddhist view:

no, choose another means. It goes against the first precept.

Christian view:

for those that believe in *stewardship*, no as it is not taking care of the world given to us to look after.

For those that believe in *dominion*, then it can be okay as they were given to us to help us.

Euthanasia

Assistance and expertise in death is given to those who maybe suffering, terminally ill or in a deteriorating condition.

Christian view point: NO

Sanctity of Life -all life is sacred, only God can take it away

Buddhist viewpoint:

No – it goes against the 1st precept, there life must be made as comfortable as possible.

Yes – If their life and those around them are being harmed, must only be in very exceptional circumstances

Christian teachings about life (BBC bitesize):

Buddhist teachings about life (BBC bitesize):

Year 9 and 10 Knowledge Goals: Religious Studies

Autumn Term: **Tier 3 Vocabulary**		
	Key word	Definition
1	abortion	The deliberate ending of a pregnancy.
2	Afterlife	Beliefs about what happens to 'us' after our body has died; in many religions this relates to life after death or immortality in some form. Animal experimentation
3	animal experimentation	The use of animals for medical research and product testing.
4	awe and wonder	Sense of wonderment at nature; often linked to the feeling that God is involved/revealed through it.
5	Big Bang Theory	Scientific theory about the origins of the universe; belief that the universe began almost 14 billion years ago with a reaction of particles from a singularity followed by a process of inflation and expansion.
6	death	The end of physical life.
7	dominion	Belief that humans have been given control/charge of the world.
8	environment	The world around us; this can be made up natural or artificial surroundings.
9	euthanasia	Assisting with the ending of life for a person who is terminally ill or has degenerative illness; often known as assisted suicide.
10	evolution	Scientific theory of the development of species which involves a process of natural selection and survival of the fittest.
11	natural resources	Resources which are found in nature – fossil fuels (eg coal, oil, natural gas), plants etc.

Notes

Year 9 and 10 Knowledge Goals: Religious Studies (Buddhism)

The Essentials of Buddhism

- There are currently 376 million Buddhists worldwide
- There are 180,000 Buddhists living in Britain
- Buddhism starts with Siddhartha Gautama as a result of his search to find the answer to end suffering.
- Siddhartha Gautama later became know as the Buddha (Buddha means 'enlightened one' and 'awakened one'.
- Siddhartha Gautama teachings, or Dhamma/Dharma, were not written down until hundreds of years after his death. These writings are know known as the **Tiptaka**
- The **two** main schools of Buddhism are **Theravada Buddhism** and **Mahayana Buddhism.**
- Buddhists try to reduce suffering through following the Buddha's teachings (Dhamma/Dharma). They believe when they achieve enlightenment they will no longer suffer.
- The Buddha taught that there are four truths about suffering **The Four Noble Truths**. They explain why people suffer and who they can overcome it. **The Eightfold Path** is a series of practices that Buddhists can follow to overcome suffering. They are split into 3 categories – ethics, meditation and wisdom. This is known as the **Threefold Way.**

Meditation is essential in Buddhism. Therefore, in order to achieve **enlightenment**, Buddhists must know how to meditate properly. The different types are:

- **Samatha meditation**
- **Vipassana meditation**
- **Zazen**
- **Visualisation**

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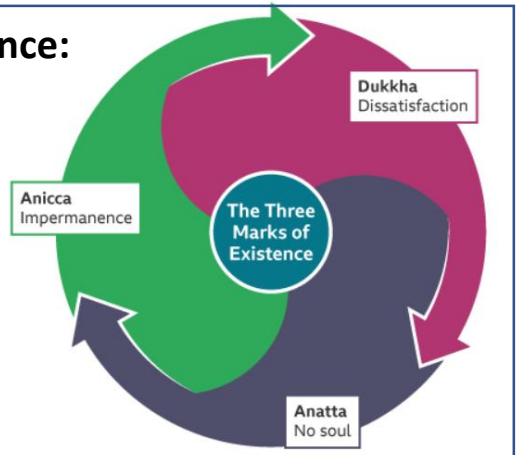
The Three Marks of Existence:

- Dukkha
- Anatta
- Anicca



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The 4 Noble Truths

Noble Truth	Buddhist word	Meaning
Suffering	**Dukkha**	Accepting that all life is impermanent and imperfect, and that it involves suffering (frustration or dissatisfaction).
Origin of suffering	**Samudaya**	Knowing that there are things in life that cause suffering. The main cause of suffering is **tanha** (cravings). **The Three Poisons** of greed, ignorance and hatred keep people in **samsara**
End of suffering	**Nirodha**	Understanding that suffering can be ended if we detach ourselves from craving and desire.
Path to the end of suffering	**Magga**	Knowing that there is a way to end suffering: **The Eightfold Path/Threefold way**

Year 9 and 10 Knowledge Goals: Religious Studies

Tier 3 Vocabulary

	Key word	Definition
1	anatta	The belief that human beings have no permanent personal self or soul.
2	anicca	The belief in impermanence; One of the Three Marks of Existence in Buddhist teaching.
3	dhamma (Dharma)	Dhamma/Dharma is Buddhist doctrine about the nature of existence and includes the teachings of the Buddha.
4	dependent arising	Everything is dependent on something else.
5	dukkha	Suffering; illness; dissatisfaction; imperfection. An unavoidable fact of existence according to the first Noble Truth. One of the Three Marks of Existence
6	enlightenment	The realisation of the truth about life. In Buddhism it releases a person from the cycle of rebirth.
7	Four Noble Truths	The four truths the Buddha taught about suffering. They explain why people suffer and how to overcome it.
	samatha	Calming meditation
8	samsara	The cycle of birth, death and rebirth
9	The Three Marks of Existence	The nature of reality. We all suffer, all things are impermanent and there is no fixed self or soul
10	vipassana	Insight meditation

Scan me to take the quiz

Notes

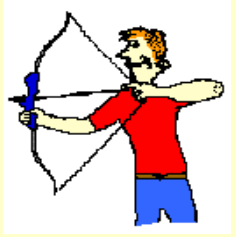
Year 9 and 10 Knowledge Goals: Science (Energy)

Stores of energy

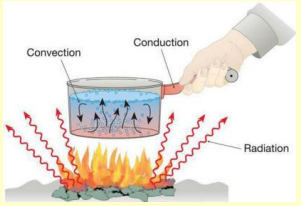
Energy store	Description	Examples
Internal (thermal)	The total kinetic and potential energy of the particles in an object, in most cases this is the vibrations - also known as the kinetic energy - of particles.	Human bodies, hot coffees, stoves or hobs. Ice particles vibrate slower, but still have energy.
Chemical	The energy stored in chemical bonds, such as those between molecules.	Foods, muscles, electrical cells.
Kinetic	The energy of a moving object.	Runners, buses, comets.
Elastic potential	The energy stored when an object is stretched or squashed.	Drawn catapults, compressed springs, inflated balloons.
Gravitational potential	The energy of an object at height.	Aeroplanes, kites, mugs on a table.

Ways of transferring energy between stores

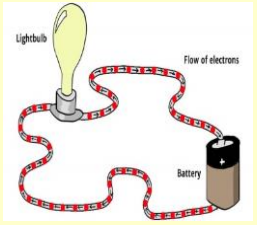
Mechanically



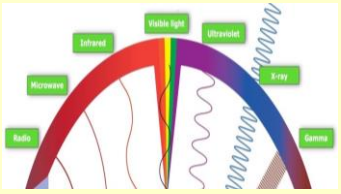
By heating



Electrically



By waves



The conservation of energy

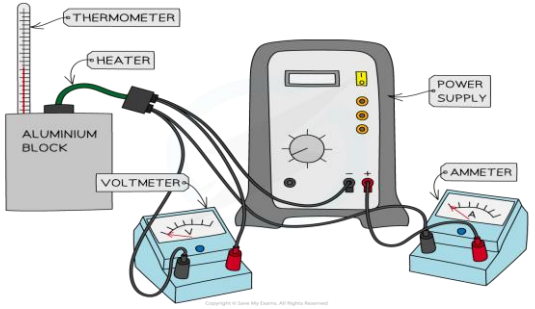
Energy can be transferred usefully, stored or dissipated, but it cannot be created or destroyed.

Specific heat capacity

The specific heat capacity of a material is the energy required to raise one kilogram (kg) of the material by one degree Celsius (°C).

Investigating specific heat capacity

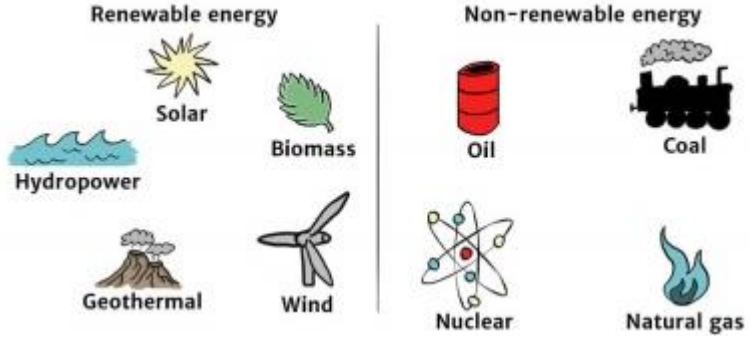
1. Place the immersion heater into the central hole at the top of the block.
2. Place the thermometer into the smaller hole and put a couple of drops of oil into the hole to make sure the thermometer is surrounded by hot material.
3. Fully insulate the block by wrapping it loosely with cotton wool.
4. Record the temperature of the block.
5. Connect the heater to the power supply and turn it off after ten minutes.
6. After ten minutes the temperature will still rise even though the heater has been turned off and then it will begin to cool. Record the highest temperature that it reaches and calculate the temperature rise during the experiment.



Watch the video on this practical by scanning the top QR code.

Then test your knowledge with the quiz on the bottom QR code.

Energy resources



SCAN ME

Check out this video on different energy resources. The next few videos on the channel go into each resource in more detail.

Key equations for you to practice

kinetic energy = 0.5 × mass × (speed)^2

elastic potential energy = 0.5 × spring constant × (extension)^2

gravitational potential energy = mass × gravitational field strength × height

change in thermal energy = mass × specific heat capacity × temperature change

$$\text{power} = \frac{\text{energy transferred}}{\text{time}}$$

$$\text{power} = \frac{\text{work done}}{\text{time}}$$

$$\text{efficiency} = \frac{\text{useful output energy transfer}}{\text{total input energy transfer}}$$

$$\text{efficiency} = \frac{\text{useful power output}}{\text{total power input}}$$

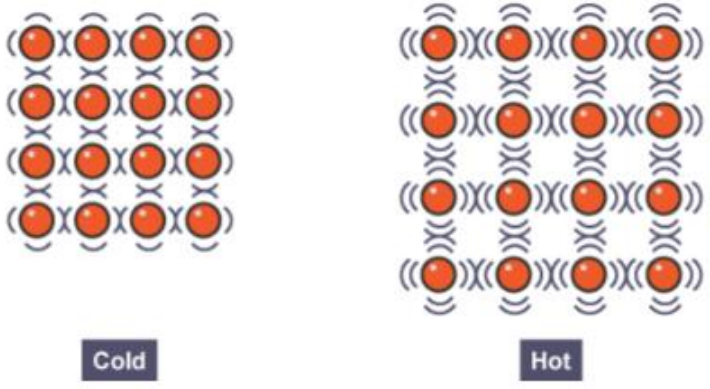
Year 9 and 10 Knowledge Goals: Science (Energy)

Conduction

- Conduction is the flow of heat energy from a region of high temperature to a region of low temperature without overall movement of the material itself.
- Occurs mainly in solids – most liquids are really poor conductors and hardly any conduction occurs in gases.
- A poor conductor of heat is called an insulator.
- Metals are good conductors of heat.
- Metals are good conductors because they contain free electrons.
- Trapped air is a very good natural insulator.
- Hair, fur, feathers and wool are good insulators because they trap air.

Conduction in solids

The atoms of a solid are held together by chemical bonds. The atoms are fixed in place but are free to vibrate.
When part of a solid absorbs heat energy the atoms vibrate faster and with bigger amplitude. These vibrations pass from atom to atom, transferring heat energy as they do.
This process happens in all solids when heated but is a slow process.



Conduction in metals

Some of the electrons in a piece of metal can leave their atoms and move about in the metal as free electrons. The parts of the metal atoms left behind are now positively charged metal ions.

When the free electrons absorb heat energy, they gain kinetic energy and move much faster. As they move through the metal, they crash into the metal ions.
Some of their kinetic energy is absorbed by the ions and they vibrate faster, and with greater amplitude. We observe this as a rise in temperature of the metal.

This process is very much faster than conduction caused by just passing vibrations from atom to atom. So, conduction in metals is faster than in non-metals.
Metals are good conductors of heat energy because they contain free electrons.

Emission and absorption of infrared radiation

All bodies (objects) emit and absorb infrared radiation. They do this whatever their temperature.

The hotter the body:

the more infrared radiation it gives out in a given time
the greater the proportion of emitted radiation is visible light.

Black bodies

There are no known objects that are perfect at absorbing or emitting all the radiation, of every possible frequency, that may be directed at it. Some objects do, however, come close to this and these are referred to as "black bodies".

Heat transfer by radiation

Heat can be transferred by infrared radiation.

Because no particles are involved, radiation can work through the vacuum of space. This is why we can still feel heat of the Sun even though it is 150 million km away from Earth.

Heat radiation investigation

The transfer of infrared radiation from a hot object to cooler surroundings can be investigated using a piece of apparatus called Leslie's cube.
This is a metal cube with four side prepared in different ways: black, white, shiny, or dull.
It can be filled with hot water or heated on an electrical hot plate so that all four sides are at the same temperature.

Method

1. Measure the temperature a fixed distance from each side of a Leslie's cube using four identical thermometers.
2. Heat the Leslie's cube by filling it with boiling water.
3. Continue to measure and record the temperatures every 30 seconds for five minutes, then plot a graph of temperature on the y-axis, against time on the x-axis, for each side.
4. Compare the four graphs obtained.

Control Variables

Distance of each thermometer from the sides of the cube, the type of thermometer used and the time taken for each reading.

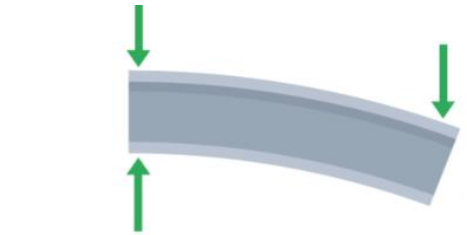
Year 9 and 10 Knowledge Goals: Science (Energy)

Change of Shape

What a force acts on an object, the object may change shape by bending, stretching or compressing - or a combination of all three shape changes.

However, there must be more than one force acting to change the shape of a stationary object in the following ways:

Bend an object's ends past each other, eg when an archer pulls an arrow back against a bow.



Pull an object's ends apart, eg when a rubber band is stretched.

Push an object's ends together, eg when an empty drinks can is squashed.

- A change in shape is called deformation.
- Elastic deformation is reversed when the force is removed
- Inelastic deformation is not fully reversed when the force is removed – there is a permanent change in shape.

Hooke's Law

Extension happens when an object increases in length and compression happens when it decreases in length. The extension of an elastic object, such as a spring, is described by Hooke's Law.

force = spring constant × extension

This is when:

- force (F) is measured in newtons (N)
- spring constant (k) is measured in newtons per metre (N/m)
- extension (e), or increase in length, is measured in metres (m)

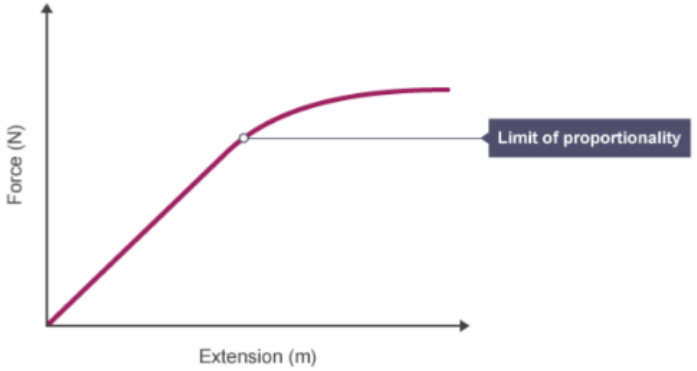
Limits of proportionality

Spring constant is a measure of the stiffness of a spring up to its limit of proportionality. The limits of proportionality refers to the point beyond which Hooke's law is no longer true when stretching a material

The higher the spring constant, the stiffer the spring. The spring constant is different for different elastic objects. For a given spring and other elastic objects, the extension is directly proportional to the force applied. For example, if the force is doubled, the extension doubles. This works until the limit of proportionality is exceeded.

The **elastic limit** of a material is the furthest point it can be stretched or deformed while being able to return to its previous shape. When an elastic object is stretched beyond its elastic limit, the object does not return to its original length or shape when the force is removed. Once a material has gone past its elastic limit, its deformation is said to be **inelastic**.

Force-extension graphs



Energy Stored in a Spring

Work is done when a spring is extended or compressed. Elastic potential energy is stored in the spring. Provided inelastic deformation has not happened, work done is equal to the elastic potential energy stored.

The elastic potential energy stored can be calculated using the equation:

elastic potential energy = 0.5 × spring constant × $(\text{extension})^2$

This is when:

- elastic potential energy (E_e) is measured in joules (J)
- spring constant (k) is measured in newtons per metre (N/m)
- extension (e), referring to the increase in length, is measured in metres (m)

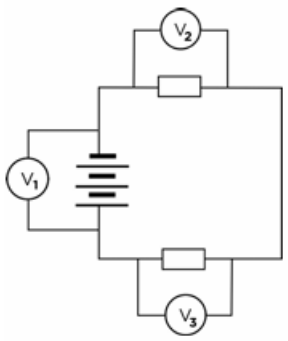
Year 9 and 10 Knowledge Goals: Science (Energy)

Autumn Term: **Tier 3 Vocabulary**		
	Key word	Definition
1	conduction	*The transfer of energy through solids as the particles vibrate and collide with each other.*
2	convection	*The transfer of energy through fluids as convection currents form.*
3	dissipation	*The wasting of energy to the surroundings. It is not transferred usefully.*
4	economic	*Factors to do with money such as start-up costs and running costs.*
5	efficiency	*A measure of total input compared to useful output for an energy transfer.*
6	environmental	*Factors to do with the environment such as habitat loss, oil spills, release of carbon dioxide, acid rain.*
7	insulation	*Material with a low thermal conductivity which will not allow energy (heat) to transfer through it.*
8	lubrication	*Anything which will reduce friction between two surfaces. Often used to reduce energy wastage.*
9	power	*The rate at which energy is transferred.*
10	reliable	*An energy resource that will work when we need it to and can be increased to meet an increase in the demand for energy.*
11	renewable	*An energy resource that will not run out.*
12	system	*An object or group of objects that we are interested in. Can be open-loop or closed-loop.*

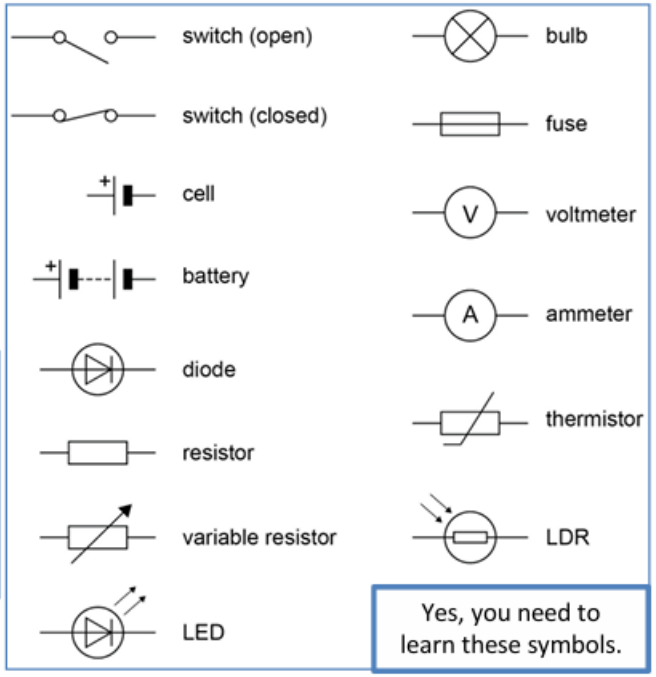
Notes

Year 9 and 10 Knowledge Goals: Science (Electricity)

Circuit Symbols



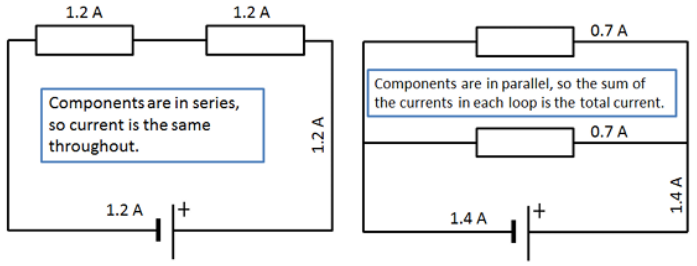
Look how the voltmeters are added **across** the components to measure the potential difference across them.

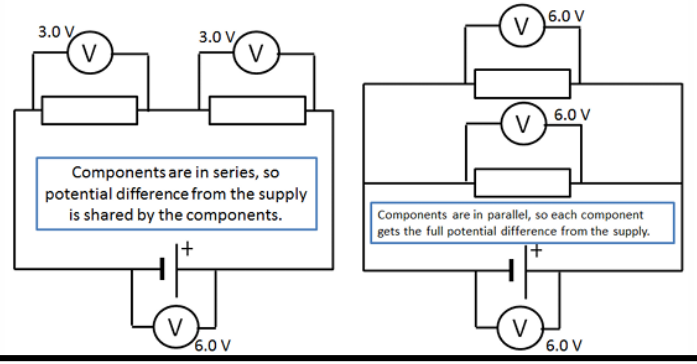


Yes, you need to learn these symbols.

Key Terms	Definitions
Electric charge	Just a positive or negative charge! In most electrical circuits, the electric charges that are flowing are **electrons** – which are of course negatively charged. Symbol: *Q*
Current	The rate of flow of electric charge (i.e. speed). Calculated by dividing the size of the charge by the time. Symbol: *I*
Potential difference	Also known as voltage, or p.d.. The potential difference is a measure of how much work is done per coulomb of charge.
Resistance	Resistance determines the size of the current for a particular potential difference.

Quantity	Components connected in series...	Components connected in parallel...
Current	The current through each component is identical	Shared between the loops. The total current through the whole circuit is the **sum** of the currents through each loop of the circuit.
Potential difference	The potential difference provided by the power supply is shared between the components in series (not necessarily equally shared out – it depends on the resistance of each component).	Each loop receives the full potential difference provided by the power supply. If we are dealing with just two components in parallel, the potential difference across each is exactly the same, and exactly the same as the potential difference provided by the power supply.
Resistance	The total resistance of two components is the **sum** of the resistance of each component (see equation). So, adding more resistors in series *increases* the total resistance.	The total resistance of two components in parallel is always **less** than the smallest resistance of the components. As a result, adding **more** resistors in parallel actually *decreases* the overall resistance.





Direct and alternating potential difference

The flow of charge (current) in a circuit can travel in one direction around the circuit only. This is due to a **direct** supply of potential difference, also known as dc. Cells and batteries provide a direct potential difference. However, it is possible for the direction of the current to change back and forth in a circuit. This happens when there the supply provides an **alternating** potential difference – also known as ac. This means the p.d. is constantly switching from positive to negative, which you can see if you measure the p.d. and produce an image of is on an **oscilloscope**, as the diagram shows. The rate at which the p.d. switches from positive to negative is called the frequency of the supply. The bottom image, since the supply is a battery, shows a direct potential difference.

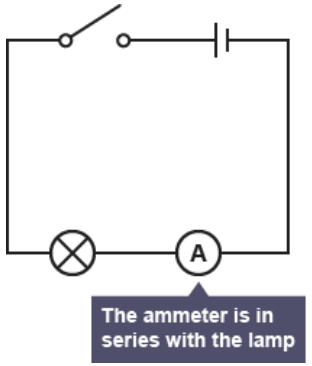
Mains electricity

Mains electricity (the supply into your house/school etc. that comes through the plugs) is an ac supply. In the UK, we have a supply with a p.d. of about 230V, and the frequency is 50 Hz.

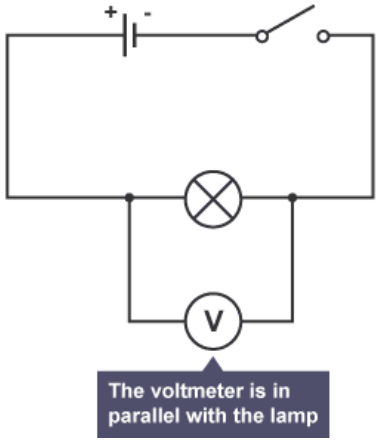
Year 9 and 10 Knowledge Goals: Science (Electricity)

Equation	Meanings of terms in equation
* $P = V\,I$	*P = power (watts, W)* *V = potential difference (volts, V)* *I = current (amps, A)*
* $P = I^2\,R$	*P = power (watts, W)* *I = current (amps, A)* *R = resistance (ohms, Ω)*
* $E = P\,t$	*E = energy transferred (joules, J)* *P = power (watts, W)* *t = time (seconds, s)*
* $E = Q\,V$	*E = energy transferred (joules, J)* *Q = charge flow (coulombs, C)* *V = potential difference (volts, V)*

Current is measured with an ammeter in series. (Unit: amps)

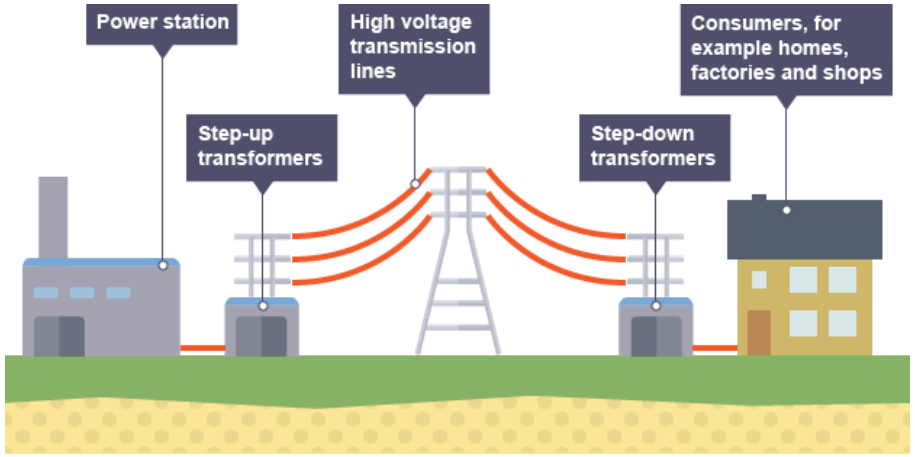


Potential difference is measures with a voltmeter in parallel to the component. (Unit : Volts)



Resistance in a wire required practical:

National grid

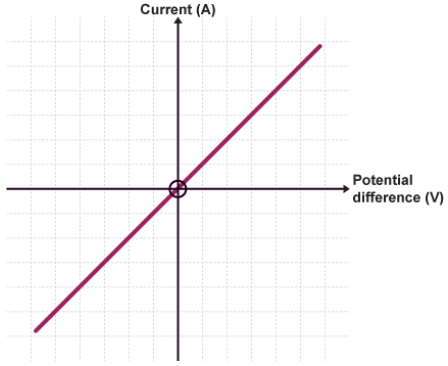


Test yourself:

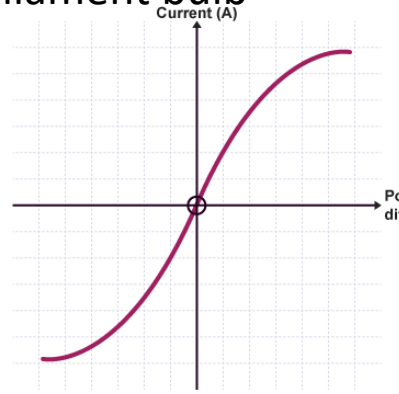
IV Characteristic Graphs

Electrical symbols

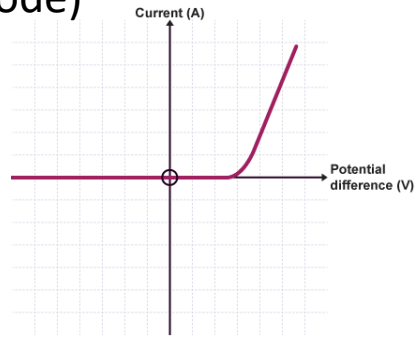
Ohmic conductor



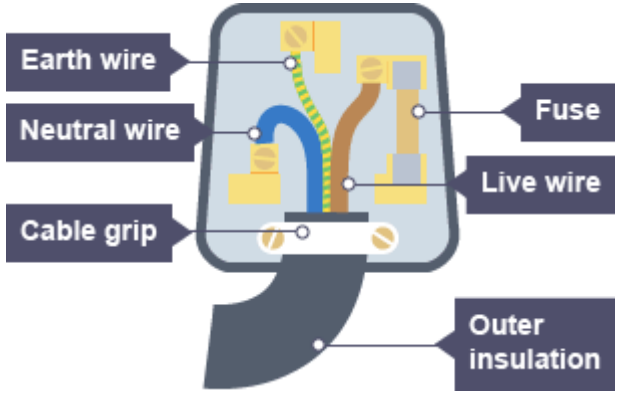
Filament bulb



Semiconductor (diode)



Wiring a plug



Year 9 and 10 Knowledge Goals: Science (Electricity)

Autumn Term: **Tier 3 Vocabulary**		
	Key word	Definition
1	charge	Property of matter that causes a force when near another charge. Charge comes in two forms, positive and negative.
2	potential difference	The potential difference (or voltage) of a supply is a measure of the energy given to the charge carriers in a circuit.
3	current	Moving electric charges, eg electrons moving through a metal wire
4	parallel	In a parallel circuit, the current divides into two or more paths before recombining to complete the circuit.
5	series	A circuit where one component follows directly from another
6	ohmic conductor	A device that obeys Ohm's Law - potential difference and current are proportional, eg wire, resistor.
7	filament	A thin, high resistance wire that gets hot and glows when a current flows through it causing it to emit heat and light. Filaments are used in some types of bulb and electrical heaters.
8	component	Working parts of a product or system.
9	direct current	Direct current is the movement of charge through a conductor in one direction only
10	alternating current	Also called ac. An electric current that regularly changes its direction and size.
11	resistance	The opposition in an electrical component to the movement of electrical charge through it. Resistance is measured in ohms.
12	power	The energy transferred each second, measured in watts (W). Power = work done ÷ time taken.

Notes

Year 9 and 10 Knowledge Goals: Sport Science

Key information

1. **Extrinsic Factors-** Type of activity, Coaching/Supervision, Environmental factors, Equipment and Safety Hazards.
2. **Intrinsic Factors-** Physical preparation, individual variables, psychological factors poor posture and sport injuries related to poor posture.
3. **Physical and Psychological** benefits of a warm up- Increase in body temperature, increase heart rate, increase flexibility, speeds up delivery of oxygen, controls arousal levels, Improves concentration and focus, increases motivation and there is time for mental rehearsal.
4. **Physical and Psychological** benefits of a cool down- **Gradually** lowering heart rate, blood pressure, breathing rate and body temperature. Also helps remove lactic acid, improves **confidence,** performer can relax after intense exercise, control arousal level, team bonding and improves motivation.
5. **Specific needs** which a warmup and cool down must consider- Characteristics of an individual or group, Suitability for the particular activity/ sport and Environmental factors.
6. **Hot Treatment** increase blood flow to an area which reduces pain, stiffness and promotes heeling.
7. **Cold treatment** decrease blood flow to an area which reduced swelling and controls pain.
8. **Diabetes-** Type 1 (Insulin-dependent diabetes) requires insulin injections. Type 2 (Insulin-resistant diabetes) usually managed through careful dietary control.

SALTAPS on-field assessment routine

See	Ask	Look	Touch	Active	Passive	Strength
Ask if anyone saw anything. Check persons facial expressions	Ask the player what happened , how they feel	Look at injured limbs for obvious signs of injury.	Touch the injured site if the player will let you, gently to find source of pain	Active movement: can the player move the limb, with or without pain?	Can the athlete move the limb/joint through the full range of movement.	Can the athlete support their own weight? Are they able to get up?

RICE- responding to acute/ soft tissue injuries.

Rest	Ice	Compress	Elevation
The performer should shop the activity and avoid using the injured part.	Ice pack should be applied to help reduce swelling.	Bandage the injured part to help reduce swelling.	Keep injured area above the level of the heart to reduce blood flow.

5 Components of a warm up

Pulse raiser	Mobility	Dynamic movement	Stretching	Skill rehearsal
Increases heart rate and body temperature	Takes joints round their full range of movement.	Movement involving change of speed and direction as these movements will be used in training sessions.	Lengthen the muscle in preparation for exercise.	Practicing the actions that are about to be used in a game or activity.

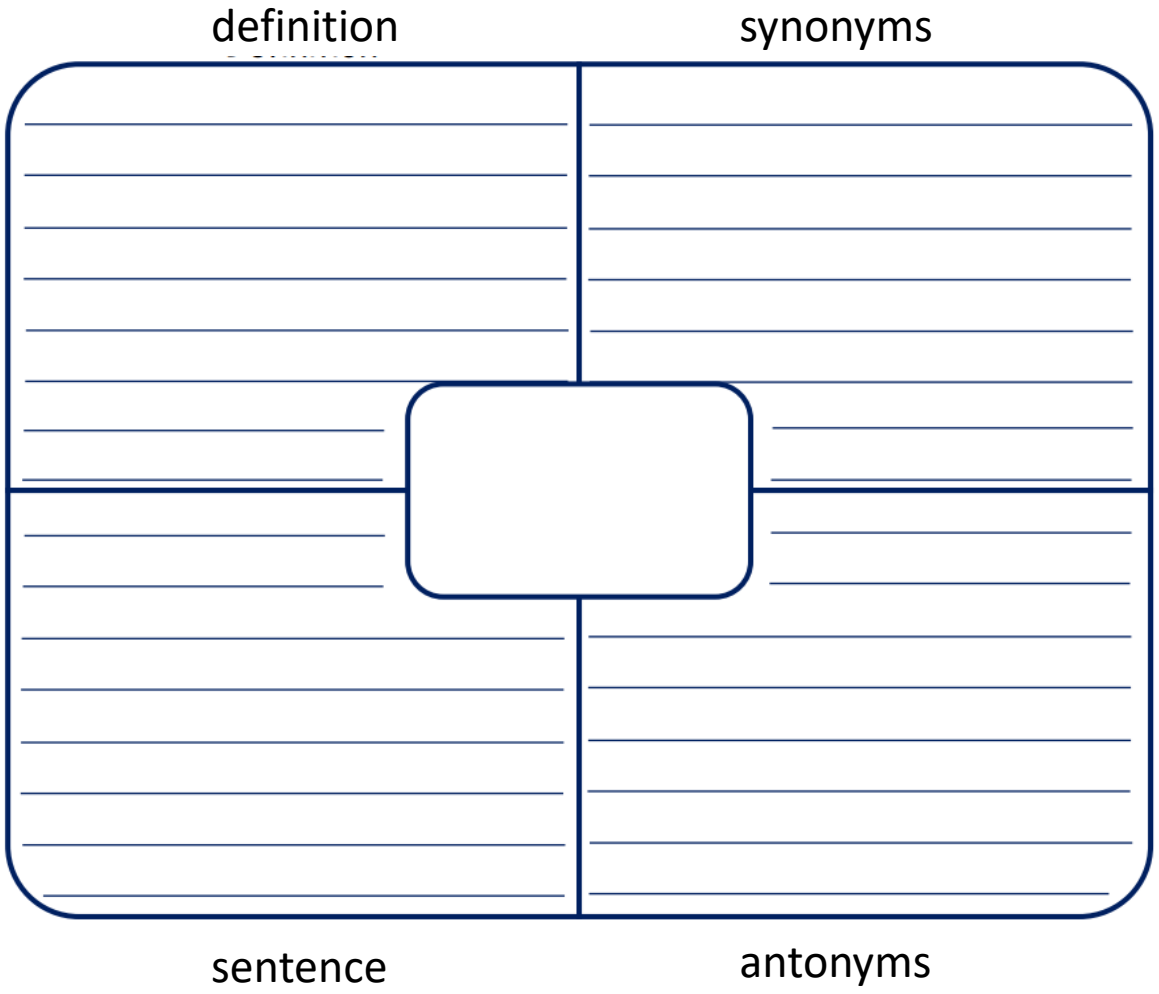
AO1: Posture	AO2: Warmups	AO3: Injury Response	AO4: Epilepsy

Year 9 and 10 Knowledge Goals: Sport Science

Autumn Term: **Tier 3 Vocabulary**		
	Key word	Definition
1	extrinsic factors	Risks and factors that can cause injuries from **outside** the body.
2	intrinsic factors	Risks and factors that can cause injuries from **inside** the body.
3	acute injuries	Injuries that caused by sudden trauma.
4	chronic injuries	Injuries caused by continuous and repeated stress on an area of the body.
5	soft tissues injuries	Damage to the muscle, ligament and tendons.
6	EAP	Emergency action plan- Written document identifying what action to take in the event of an emergency at a sporting event.
7	asthma	Lung condition that cause occasional breathing difficulties.
8	diabetes	Condition in which blood sugar level are unregulated by the body.
9	epilepsy	Condition causing abnormal brain activity.
10	mental Rehearsal	Visualising or imagining each aspect of the activity before preforming it.
11	lactic acid	Waste product of anaerobic exercise which causes fatigue.
12	psychological factors	Mental factors that can affect a performer positively or negatively.

Notes

Literacy: Tier 2 Vocabulary – Frayer Model



Synonyms are words with the same or similar meaning:

- words such as happy, cheerful and merry.
- words such as sad, miserable and heartbroken.

Antonyms are words with opposite meanings:

- words such as angry and peaceful.
- words such as funny and serious.

You can use a **thesaurus** to find **synonyms** and **antonyms** for words.

Scan to view thesaurus

click to view thesaurus

Have a go at creating a Frayer Model for each of the 6 tier 2 words from this term (blank templates are at the back of the booklet for you to complete this activity).

Frayer Model: Alleviate

definition

synonyms

alleviate

sentence

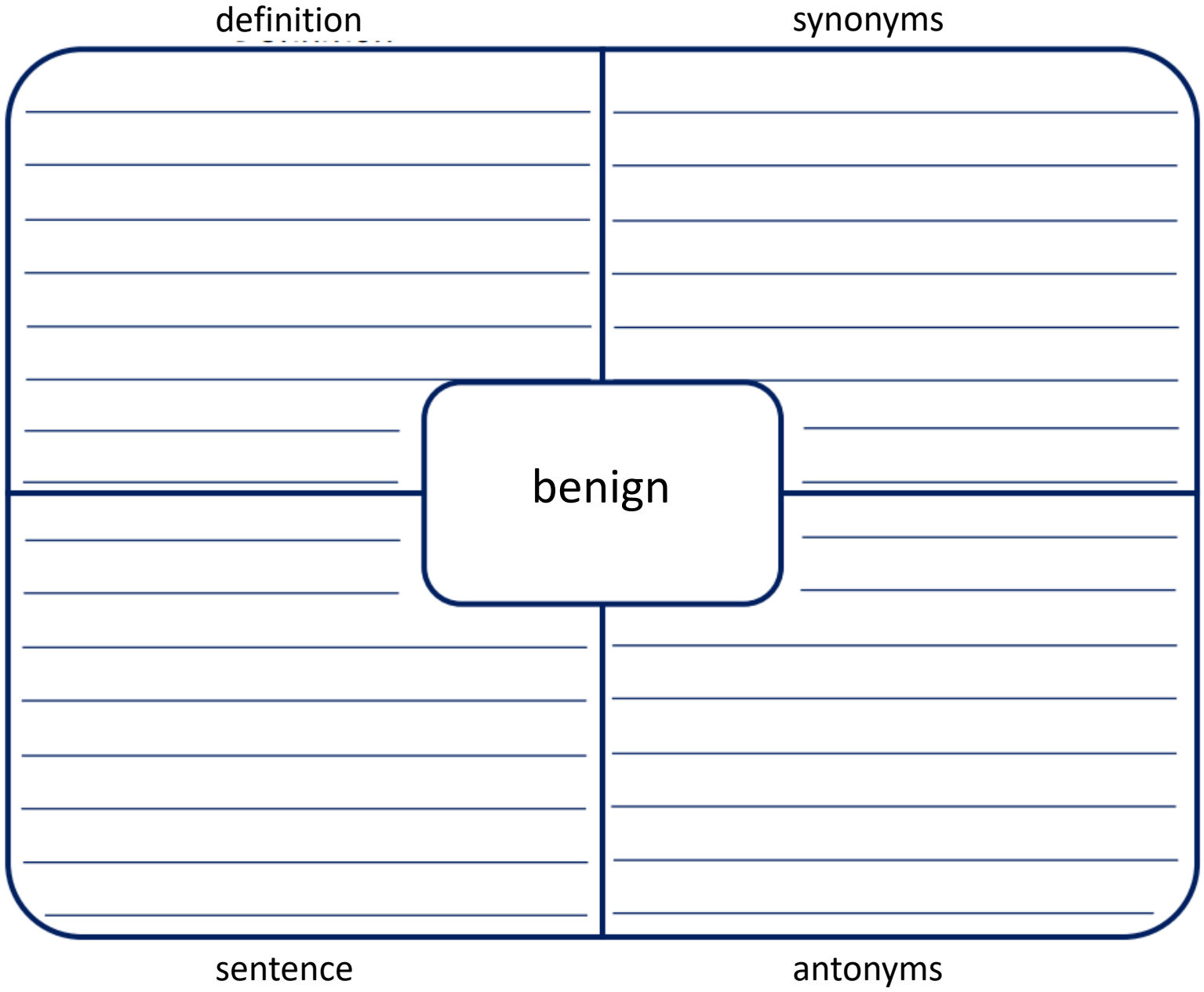
antonyms

Complete a Frayer Model for the word **alleviate**.

Scan to view thesaurus

click to view thesaurus

Frayer Model: Benign



Complete a Frayer Model for the word **benign**.

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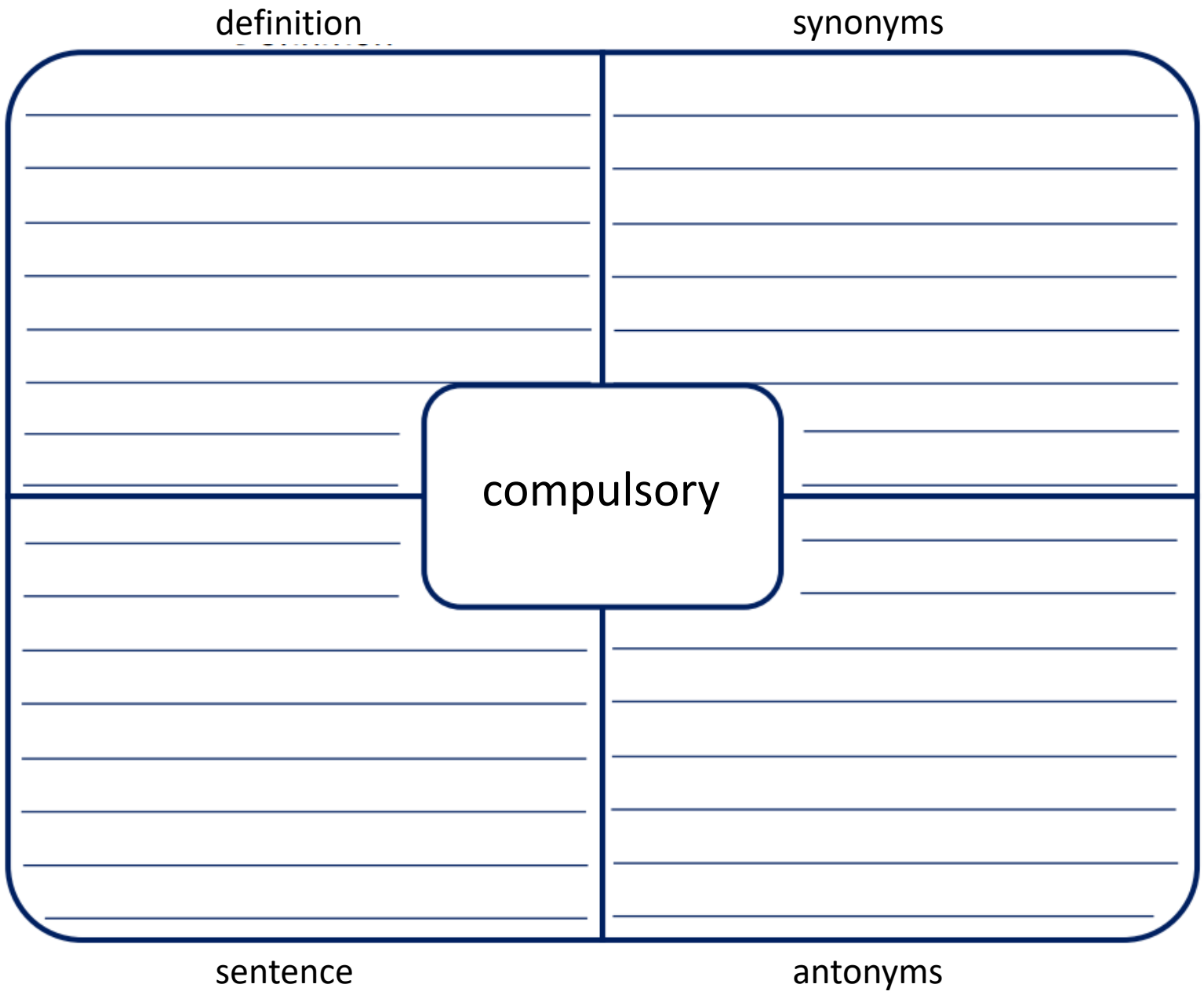
Frayer Model: Compulsory



Complete a Frayer Model for the word **compulsory**.

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click to view thesaurus

Frayer Model: Deteriorate

definition

synonyms

deteriorate

sentence

antonyms

Complete a Frayer Model for the word **deteriorate**.

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click to view thesaurus

Frayer Model: Encounter

definition

synonyms

encounter

sentence

antonyms

Complete a Frayer Model for the word **encounter**.

Scan to view thesaurus

click to view thesaurus

Frayer Model: Ferocious

definition

synonyms

ferocious

sentence

antonyms

Complete a Frayer Model for the word **ferocious**.

Scan to view thesaurus

click to view thesaurus