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Literacy Knowledge Organiser

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

PUNCTUATION MARKS

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



Sentences

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

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



100 most commonly misspelled words

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

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

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

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



Building cohesion within and across a paragraph

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

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

Using hyphens

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



Man eating shark



Man-eating shark

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

Using punctuation to separate clauses

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

Description: detail sentences.

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

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

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

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

Becomes:

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

A dash is often best used to summarise:

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

Colons and semi-colons within lists.

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

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

Important Exam Information

- Paper 1 Section B
- Extract question
- No choice of question
- 45 minutes

GCSE English Literature: Paper 1

A Christmas Carol: Knowledge Organiser

A Christmas Carol – Context

Dickens' Life

Charles Dickens was born in 1812 in Kent and moved to London at the age of 9. When he was 12 years of age, his father was arrested and sent to a debtors' prison. Dickens' mother moved seven of their children into prison with their father but took Charles out of school and arranged for him to live alone outside the prison, working with other child labourers in a terrible job which involved pasting labels on bottles in a blacking (shoe polish) warehouse; he was poorly paid and the conditions were extremely bad. Much of Dickens' writing is influenced by his early experiences.

Social and Historical Context

Dickens was born into a time of great change in the way people lived. The Industrial Revolution was taking place and there was a sudden growth in the cities – the economy shifted from agriculture to industry and trade. As a result, many people who had once lived in rural communities moved to the city in huge numbers, causing overcrowding. Money from industry made the rich richer and the rich/poor gap widened. Workers had to toil for long hours for little money and, out of necessity, children of all ages often did not go to school and worked long hours for little money. Compulsory education was introduced by Queen Victoria so many children were taught to read and write in Victorian times where they would not have been early. However, despite this, most poor children still ended up in low-paid jobs and working in appalling conditions. The housing was dreadful for working class families who often lived in squalor and deprivation where disease spread rapidly. There was no NHS and so poor people rarely had access to any form of medical help if they fell ill. Child mortality was very high. In the poorer quarters of the big cities, almost 1 in 5 children born had died by the age of five. The main cause of death was polluted drinking water, damp, and tuberculosis, which claimed between 60,000 and 70,000 lives in each decade of Queen Victoria's reign. Disease spread rapidly due to over-crowding and also due to the very unhygienic way that the poor had to live as they had little access to clean water. For those who were unable to work and support themselves, there were workhouses. These were not intended to be pleasant places to stay. Men, women, and families were separated and those who were physically able were expected to work for their keep. Like the workhouses there were debtors' prisons (those who were unable to pay a debt went here) such as a Marshlea, where Charles Dickens' father spent time. If you could not look after your family the workhouse was the only option that you had, or your family would be left to the starve. There was no system to support those who could not work and so people found themselves with little choice. The wealthy few, on the other hand, lived in luxury with large houses, plenty of money and food. Their children did not work, were educated, and often had expensive toys and nice clothes. The rich had to be seen to be civilised and adhere to a strict set of morals that were considered very important for high society in the Victorian age. Victorians are well known for being prudish and overly polite in their interactions for this reason. However, this was often criticised for being hypocritical, because the rich lived such different lives to the poor and often did little to help them.

A Christmas Carol

During this time of unrelenting social change, Dickens wrote A Christmas Carol. Firstly, he wanted to write a good 'ghost' story - these were extremely popular at the time and he had hoped that this would be a good story for families to enjoy sitting around the fire on a cold winter's night. Victorians were extremely interested in the supernatural and many of them firmly believed in ghosts and the idea of spirits visiting them from the dead and so the story would not have seemed at all far-fetched or unrealistic to them. However, he also had the intention of drawing readers' attention to the plight of England's poorest, a recurring theme in many of his novels. As such, the novella can be read as a social criticism, an allegory.

Malthusian Theory

Thomas Malthus was an English demographer and political economist best known for his pessimistic but highly influential views on population growth. Malthus famously argued that in a world in which economies grew arithmetically and population grew geometrically, mass want would be inevitable. His *Essay on Population* created a school of thought which continues to this day under the banners of Zero Population Growth and Sustainability. The threat of a "population bomb" under which my generation lived was Paul Ehrlich's modern rehashing of the Malthusian argument about the inability of productivity to keep pace with, let alone exceed, population growth.

Characters:

1. Ebenezer Scrooge: Miserly, mean, bitter, materialistic, unsympathetic, indifferent, cold, selfish, isolated, cynical, charitable, value driven, generous, happy, sociable, transformed.

2. Marley's Ghost:

Materialistic, self-centred, terrifying, haunting, exhausted, direct, reformed, regretful, hopeful, selfless, wise

3. Bob Cratchit: Uncomplaining, tolerant, courteous, deferential, patient, civil, eager, pleasurable, good-humoured, playful, caring, tender, cheerful, loving, forgiving.

4. Fred: Warm-hearted, empathetic, cheerful, optimistic, even-tempered, insightful, determined, generous, forgiving, jovial, enthusiastic, caring

5. Ghost of Christmas Past: Contradictory, strong, gentle, quiet, forceful, questioning, mysterious

6. Ghost of Christmas Present: Compassionate, abundant, generous, cheerful, jolly, friendly, severe, sympathetic

7. Ghost of Christmas Future: Mysterious, silent, ominous, intimidating, frightening, resolute

8. Tiny Tim: Frail, ill, good, religious

A Christmas Carol: Knowledge Organiser

The Plot

Stave One

1. Introduced to Ebenezer Scrooge on Christmas Eve. He is a lonely miser obsessed with money. He has a clerk called Bob Cratchit who is not treated well. We learn Jacob Marley, Scrooge's business partner, died exactly 7 years earlier. Scrooge is irritated that Christmas Day seems to be interrupting his business. Scrooge is visited by his nephew Fred, who invites his uncle to Christmas dinner. Scrooge refuses. Scrooge is visited by two charity workers, asking for donations. Scrooge refuses and claims he wants to be left alone. Scrooge allows Bob to have Christmas Day off. Scrooge, when he is home, is visited by the Ghost of Jacob Marley – warning him he will be visited by three more ghosts to help him change his ways.

Stave Two

Scrooge is visited by the Ghost of Christmas Past who takes him to witness his past. Scrooge is taken first to his schoolboy years and he is reminded how his friends would go home from Christmas while he was left at school. We see him with his sister, who one year took him home for the holidays. Next we are shown Scrooge as a young apprentice, working for Fezziwig. Dickens describes the Christmas ball Fezziwig organised for his employees. Finally, Scrooge is taken to see his ex-fiancée, Belle. We see the scene when they break up, as money has taken over Scrooge's life. Scrooge cannot bear to see any more and struggles with the spirit.

Stave Three

Scrooge is then visited by the Ghost of Christmas Present. The spirit shows Scrooge how the Cratchit family celebrate Christmas. Scrooge asks if Tiny Tim will live. The spirit explains unless there are changes, he will die. Scrooge is then taken to see how others celebrate Christmas: miners, lighthouse workers, sailors on a ship and to Fred's house at Christmas, where they are playing games. The spirit then begins to age, and see under the spirit's robes two children: Ignorance and Want. The Ghost of Christmas Future then appears.

Stave Four

The Ghost of Christmas Future is described. The spirit takes Scrooge to see a group of businessmen discussing someone who has died. Scrooge is then taken to see Old Joe, where he is in the process of buying property of the dead man – which have been stolen. Scrooge then returns to Bob Cratchit's house, where it is revealed Tiny Tim has died. Scrooge is then taken to the graveyard and is shown a grave stone and realises this is for him. Scrooge falls to his knees and begs that he will change his ways.

Stave Five

Scrooge wakes up in his own bed. Scrooge wonders how much time has passed and calls to a boy. He then sends the boy to the poultryman for the prize turkey to give to Bob Cratchit. Scrooge meets one of the charity collectors from earlier and whispers to him that he will give a large donation. Scrooge then goes to Fred's house and is welcomed in. He enjoys the dinner and party. On Boxing Day, Scrooge arrives early to work, and plays a trick on Bob. Scrooge then tells him he is going to raise his salary and promises to help Bob's struggling family. Scrooge is described to have completely changed and becomes a 'second father' to Tiny Tim – 'who did not die.'

Key Quotations (AO1):

Stave One

"a squeezing, wrenching, grasping, scraping, clutching, covetous old sinner" – about Scrooge

"Solitary as an oyster" – about Scrooge

'A tight-fisted hand at the grindstone' – about Scrooge

"Bah! Humbug!" – Scrooge's reaction to Christmas

"Are there no prisons? Are there no workhouses?" – Scrooge's reaction to the charity men asking for money to support the poor

"If they are to die they had better do it, and decrease the surplus population!" – Scrooge's reaction to hearing that poor people would rather die than go to the workhouse. This quotation links to Malthusian theory (see other side of sheet)

'His face was ruddy and handsome, his eyes sparkled' – Fred (presented as the opposite to Scrooge)

'I wear the chain I forged in life' – Ghost of Marley

Stave Two

'It wore a tunic of the purest white... from the crown of its head there sprung a bright clear jet of light' – Ghost of Christmas Past

'A lonely boy was sat reading near a feeble fire' – Scrooge as a young boy

"A solitary child, neglected by his friends" – Scrooge as a young boy

"Another idol as displaced me. A golden one." – What Belle tells Scrooge before she leaves him.

"Your lip is trembling," said the Ghost, "And what is that upon your cheek?" – first sign of emotion from Scrooge

Stave Three

'There sat a jolly Giant, who wore a glowing torch...it was clothed in one simple green robe' – Ghost of Christmas Present

'God bless us everyone!' – Tiny Tim's positive attitude

'Tell me Tiny Tim will live...' – Scrooge showing compassion.

"I see a vacant seat" – The Ghost's prediction about Tiny Tim if the future is not changed.

"The whole quarter reeked with crime, with filth, with misery" – A description of one of the poorer parts of London – symbol of poverty.

"This boy is Ignorance. The girl is Want. Beware them both.." – A description of the children, Ignorance and Want.

Stave Four

'The phantom slowly, gravely, silently approached' – Ghost of Christmas Yet to Come

'I fear you more than any spectre I have seen' – Scrooge

'Tell me I may sponge away the writing on this stone!' – Scrooge desperate to change his ways

'I will honour Christmas in my heart' - Scrooge

Stave Five

"I am as light as a feather. I am as happy as an angel. I am as merry as a schoolboy. I am as giddy as a drunken man!"

'I'll raise your salary Bob and endeavour to assist your struggling family' – Scrooge changing his ways.

'to Tiny Tim, who did NOT die, he [Scrooge] was a second father' – Scrooge changing his ways

'Wonderful party, wonderful games, wonderful unanimity, won-der-ful happiness!' – repetition shows Scrooge's joy at the end.

Redemption	The act of making up for something that you have done wrong
Benevolence	Kindness and generosity
Charity	Love for others and kindness in your treatment of other people
Humanity	The quality or state of being human
Ignorant	Having littler or no knowledge – being unaware either by accident or by choice
Inferior	Situated lower down from others
Superior	Situated higher up from others
Surplus	An extra amount – the amount that is more than what is needed
Misanthropy	A hatred or distrust of humankind in general
Materialistic	Being overly obsessed with material things and money
Transformed	To change completely
Regretful	To feel regret about your past actions
Empathetic	An ability to understand how people are feeling by putting yourself in their position
Resolute	To be firmly determined
Ominous	Giving a sign of future trouble or evil
Allegory	A story that contains characters and events that reflect a bigger political or social message

English Language: Paper 1 Section A

<u>Question Breakdown</u>		<u>Language Devices</u>	<u>Key words</u>
Q1 - List four things from the text [4 marks]		Simile	Comparison using like or as, used to create imagery for the reader
Q2 - "How has the writer used language?" [8 marks] 2-3 PEZZ paragraph response		Metaphor	Comparison which describes something as something that it isn't
Q3 - "How has the writer structured the text?" [8 marks] 3 paragraph response - track the beginning/middle/end of text		Personification	Giving an inanimate object human characteristics
Q4 - Essay response to statement about the text "How far do you agree?" 3-4 analytical paragraphs [20 marks]		Pathetic fallacy	Where the weather reflects the mood of the scene
<u>Evaluative Language</u>		Lexical/ semantic field	Group of words that all relate to one topic to create imagery
		Zoomorphism	Describing a human being using animal features
<u>Evaluative Language</u>		<u>Structural Devices</u>	<u>Video Link</u>
Adverbs Skillfully Successfully Carefully Cleverly Powerfully Interestingly Expertly Precisely Confusingly	Tentative/Evaluative phrases <ul style="list-style-type: none">This makes us think of...As we read this part, we feel...because...The reader is shocked/surprised by...The writer successfully uses ... which creates ...The impact of this sentence/description is...It is almost as if...There is a real sense of...You could argue...There is an underlying feeling of...	Analepsis	Flash back
		Prolepsis	Flash forward
		Shift in focus/ zoom in	Where the writer draws our attention to a specific moment, place, character or detail
		Perspective	The viewpoint through which the story is told
		Narrative hook	An engaging or intriguing line in the opening of an extract
		Cliffhanger	Where the end of a story remains uncertain or unresolved
		Resolution	When the story reaches a clear conclusion in the end
		Activate Windows Go to Settings to activate Windows	
Page 8			
			
			
			
			



English Language: Paper 1 Section B

Techniques to use:

1. Setting description	<ul style="list-style-type: none"> Describe in detail your setting: <i>weather, mood, colours, smells, sounds</i>. Paint a picture in your reader's imagination.
2. Figurative Language	<ul style="list-style-type: none"> Similes: Like a deep, inky splodge, the midnight sky covered the horizon in darkness. Metaphors: The trees, menacing monsters, flailed hopelessly in the wind. Personification: The hot beach welcomed the cool breeze, sighed with relief when it glided in from the east.
3. Use of colour	Red: crimson, blood, ruby, merlot Black: ink, midnight, soot, charcoal Yellow: butter, lemon, mustard, fire Blue: indigo, sapphire, ocean, aegean
4. Use of structural techniques	<ul style="list-style-type: none"> Use shifts in time as a powerful structural technique - e.g a flashforward or flashback Use a cyclical structure - link your opening and ending by referring to a specific object of word or open the story in media res (in the middle of the action) e.g "and then the bomb exploded"

How to structure your writing:

- DROP** the reader into the scene. Describe the **setting** in detail, using *colours, sensory language, adjectives*. Describe the **weather** to set the tone.
- SHIFT** onto describing your **character** in detail- what are they doing there? how are they feeling? What do they look like and how does this reflect their mood? **SHOW** don't **TELL**.
- ZOOM** in an important detail of your story and describe in vivid detail- how does your character interact with it? Or have a small moment of action in your story. A flashback might work here.
- ENDING** – end your piece in an exciting, mysterious or ambiguous way- does something happen to your character? Do you introduce a new detail or character at the end? Do you use a cyclical structure or end on a moment of tension/cliffhanger? You could describe the weather at the start or end, or reference an object.

What should you ensure you do?

1. Paragraphed effectively and correctly	Separate paragraphs using Drop/Shift/Zoom/End or use TipTop (time, place, topic, person.) You could try using a one line paragraph for effect. If you forget to paragraph, look for where you feel a change of paragraph would go and write // next to this
2. Proofread to check your SPAG	Use the final 5 minutes to closely check for SPAG errors. Follow your words along with your pen as you read back over your work. Think CUPS to spot basic errors: <i>Capital letters, Understanding, Punctuation, Spelling</i> .
3. Varied your sentence structures/ vary your punctuation	Don't just start with "I" or "She" - vary your sentence openers. E.g use an adverb: "Noisily she sprinted down the corridor, hoping not to be late" or start with a verb: e.g "Screaming loudly, the man fell to his knees" Use a semicolon (making sure both sentences either side of the semicolon make sense on their own with a full stop) e.g "He danced with style and grace; he was destined to become a performer."
4. Kept to one or two characters:	You should concentrate on saying a lot about very little. Fuller descriptions of one character is best. Minimal speech/dialogue is most effective. Description over speech.
5. Describe in detail – SHOW, don't TELL	Don't simply TELL the reader information - e.g. "he was nervous" SHOW them e.g "his eyes darted around and sweat formed on his brow" rather than saying "it was autumn" SHOW it e.g. "golden and crisp leaves decorated the pavement in the hazy October sun"

What vocabulary should I try to use?

Instead of '**dark**' try...
dim, unlit, black, inky, unilluminated, the abyss

Instead of '**bright**' try...
dazzling, beaming, radiant, vivid, blazing

Instead of '**happy**' try...
glad, joyous, contented, cheerful, blissful, euphoric

Instead of '**sad**' try:
miserable, melancholic, despairing, dismal, forlorn, despondent

Instead of '**eerie**' try...
unnerving, sinister, abnormal, strange, unsettling

Instead of '**mysterious**' try...
secretive, enigmatic, peculiar, curious, inexplicable

Vocabulary examples:



Exemplar Creative Writing:



Vary your Sentences



Drop/Shift/Zoom/End explained

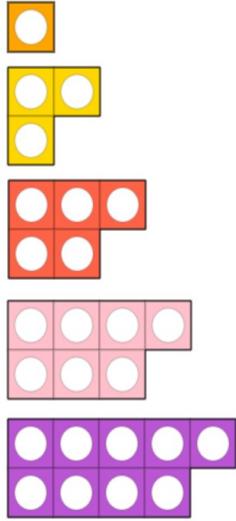


Anthology of creative writing examples:

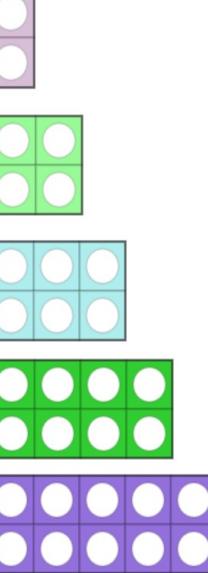


All Tiers

Odd Numbers



Even Numbers

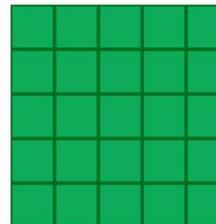


$$1 \times 1 = 1$$

$$2 \times 2 = 4$$

$$3 \times 3 = 9$$

$$4 \times 4 = 16$$



$$5 \times 5 = 25$$

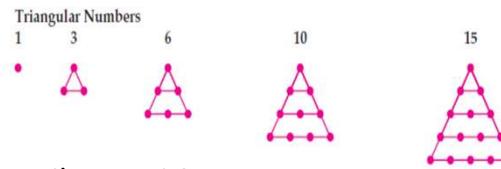
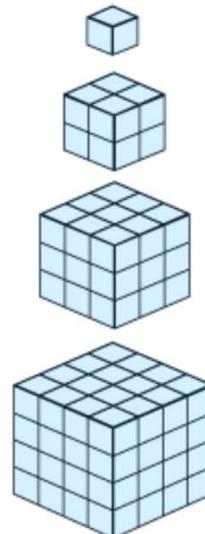
$$\begin{aligned} 6 \times 6 &= 36 \\ 7 \times 7 &= 49 \\ 8 \times 8 &= 64 \\ 9 \times 9 &= 81 \\ 10 \times 10 &= 100 \\ 11 \times 11 &= 121 \\ 12 \times 12 &= 144 \end{aligned}$$

1 is the first cube number.
because $1 \times 1 \times 1 = 1$

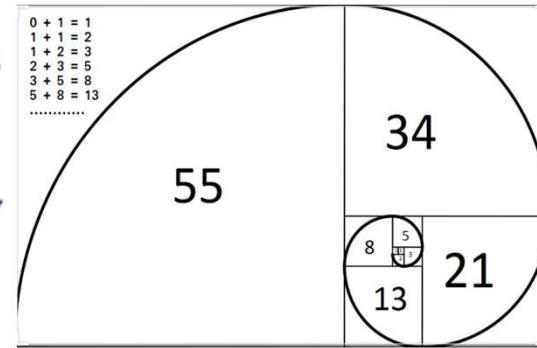
8 is the second cube number,
because $2 \times 2 \times 2 = 8$

27 is the third cube number,
because $3 \times 3 \times 3 = 27$

64 is the fourth cube number,
because $4 \times 4 \times 4 = 64$



Fibonacci Sequence



Factors & Multiples

Find the different factors of a number by working out which numbers divide into it evenly.

What are all the factors of 12?

$$12 \div 1 = 12$$

$$12 \div 2 = 6$$

$$12 \div 3 = 4$$

$$12 \div 4 = 3$$

$$12 \div 6 = 2$$

$$12 \div 12 = 1$$

$$12 \div 1 = 12$$

$$12 \times 2 = 24$$

$$12 \times 3 = 36$$

$$12 \times 4 = 48$$

$$12 \times 6 = 72$$

$$12 \times 12 = 144$$

The factors of 12 are:
1, 2, 3, 4, 6, 12

Multiples appear in the number's multiplication table. You can calculate them by counting on by that number.

What are all the multiples of 12?

$$12 \times 1 = 12$$

$$12 \times 2 = 24$$

$$12 \times 3 = 36$$

$$12 \times 4 = 48$$

$$12 \times 6 = 72$$

$$12 \times 12 = 144$$

$$12 \times 24 = 288$$

$$12 \times 36 = 432$$

$$12 \times 48 = 576$$

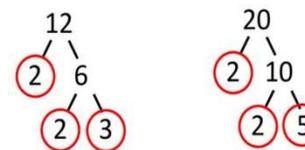
$$12 \times 72 = 864$$

$$12 \times 144 = 1728$$

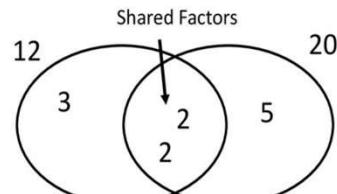
The multiples of 12 include:
12, 24, 36, 48, 72, 144, 288, 360, 432, 480, 576, 720, 864, 1728

Find the **Highest Common Factor (HCF)** & **Lowest Common Multiple (LCM)** of 12 & 20.

1) Complete Prime Factorisation for both numbers.



2) Input the Prime Factors into a Venn diagram



3) HCF = Product of **shared factors**

$$2 \times 2 = 4$$

$$12 = 2 \times 2 \times 3$$

$$20 = 2 \times 2 \times 5$$

4) LCM = Product of **all factors** in the diagram

$$2 \times 2 \times 3 \times 5 = 60$$

Prime Numbers

A natural number greater than 1 with no divisors other than 1 and itself.

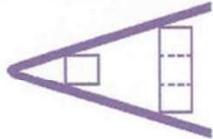
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Remember these facts about Prime Numbers!

There are no even numbers except 2.

There are no prime numbers ending in 5, except 5.

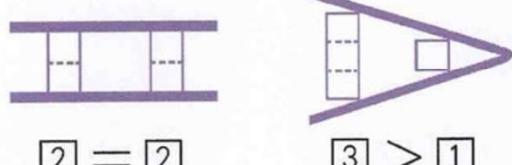
The digits can't add up to 3 except 3 (digital root).



Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
3	2	8	7	2	6	3

Place value of 3 = 3000000
 Place value of 2 = 200000
 Place value of 8 = 80000
 Place value of 7 = 7000
 Place value of 2 = 200
 Place value of 6 = 60
 Place value of 3 = 3

3287263



COMPARING & ORDERING DECIMALS

STEP 1: Stack the numbers being compared. Line up the decimal points.

4.8
4.826
4.08
4.006

STEP 2: Add zeros so that each number has the same number of decimal digits.

4.800
4.826
4.080
4.006

STEP 3: Compare each place value one by one. If a number is the same, move to the next place.

↓ ↓ ↓ ↓
4.800
4.826
4.080
4.006

STEP 4: Order the numbers from least to greatest or greatest to least. Here, they are ordered from least to greatest.

4.006, 4.080, 4.800, 4.826

Remove the zeros you previously added.

4.006, 4.08, 4.8, 4.826

Rounding to the nearest 10

Here is a numberline showing the numbers from 20 to 30.



All of these numbers are closer to 20 than 30. They would stay at tens digits of 20.
e.g. 24 → 20 (to the nearest 10)

15 is exactly between 10 and 20. By convention, we round up to 20.

All of these numbers are closer to 30 than 20. They would round up to 30.
e.g. 27 → 30 (to the nearest 10)

15 is exactly between 10 and 20. By convention, we round up to 20.

To round without a number line:

1) Identify the tens digit.
326 [The tens digit is 2, or 20.]

2) Work out the next ten up.
326 is between 320 and 330

3) Decide if it stays or rounds up.
326 [Use the units digit to decide. "5 or more rounds up", so 6 will round up to the next 10.]

$$326 \rightarrow 330$$

Rounding to whole numbers

Here is a numberline showing the numbers from 15 to 16.



All of these numbers are closer to 15 than 16. They would stay at 15.
e.g. 15.3 → 15 (to nearest whole)

15.5 is exactly between 15 and 16. By convention, we round up to 16.

All of these numbers are closer to 16 than 15. They would round up to 16.
e.g. 15.6 → 16 (to nearest whole)

15.5 is exactly between 15 and 16. By convention, we round up to 16.

To round without a number line:

1) Identify the units digit.
6.42 [The units digit is 6.]

2) Work out the next unit up.
6.42 is between 6 and 7

3) Decide if it stays or rounds up.
6.42 [Use the tenths digit to decide. "5 or more rounds up", so 4 will stay down.]

$$6.42 \rightarrow 6$$

Rounding to decimal places

Rounding to decimal places is exactly like rounding whole numbers - you just have more numbers (and therefore greater accuracy).

3.248
↑↑↑
3 is the units digit.
2 is worth 2 tenths, and is the first decimal place.
4 is worth 4 hundredths, and is the second decimal place.
8 is worth 8 thousandths, and is the third decimal place.

You will sometimes see "decimal place" shortened to "d.p."

3.248 rounded to 1 d.p.
3.248 3.248 → 3.2
↑↑↑
1st dp Look at the next digit.
3.2 4 stays down - stay at 3.2.

3248 rounded to 2 d.p.
3.248 3.248 → 3.25
↑↑↑
2nd dp 3.24
Look at the next digit.
8 rounds up - go to 3.25

Significant figures

If something is **significant**, it is big or important. The **most significant** thing is the biggest or most important thing.

3268
↑↑↑
3 is worth the most in this number (3 thousand)
It is the first significant figure.
2 is worth 2 hundred, and is the second significant figure.
6 is worth 6 tens, and is the third significant figure.
8 is worth 8 units, and is the fourth and least significant figure.

3268 3268 → 3000
↑↑↑
1 sf 3000
Look at the next digit.
2 is less than 5 - stay at 3000

3268 rounded to 2 sig. fig.
3268 3268 → 3300
↑↑↑
2 sf 3200
Look at the next digit.
6 rounds up - go to 3300

Base

5²

Index, power or exponent

How to say it: five to the power of 2

Estimating

Billy can write 24 words a minute. Estimate how long it took him to write 643 words.

When estimating, we first need to round **EVERY** number in the question to one significant figure.

We round 24 to 1 s.f. 20

We round 643 to 1 s.f. 600

$643 \div 24 \square 600 \div 20 = 30$ minutes

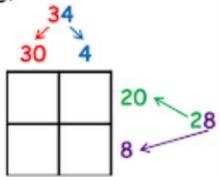
All Tiers

Multiplication: The grid method

The grid method is a useful starting point when first learning to multiply. However, it can get complicated with large numbers.

Step 1

To work out 34×28 ... split each number into tens and units, and write next to a grid like this:



Step 2

Use times tables to fill in the grid. Take care with the number of zeros needed!

$$\begin{array}{|c|c|} \hline 30 & 4 \\ \hline 30 \times 20 = 600 & 80 \\ \hline 30 \times 8 = 240 & 32 \\ \hline 4 \times 8 = 32 & 4 \times 20 = 80 \\ \hline \end{array}$$

Step 3

Add up the numbers inside the grid.

$$\begin{array}{ccccc} 30 & & 4 & & 600 \\ | & & | & & | \\ 600 & 80 & 20 & 240 & 80 \\ | & & | & & | \\ 240 & 32 & 8 & 80 & 32 \\ | & & | & & | \\ 8 & & & 80 & 32 \\ \hline & & & 952 & \\ & & & +1 & \\ & & & 953 & \\ & & & \downarrow & \\ & & & 8+3+4=15 & \\ & & & \text{Carry the ten into the next column. Don't forget to add it on!} & \end{array}$$

on a calculator

$$39\% \text{ of } 82 \\ 0.39 \times 82$$

Change to a decimal and multiply

increasing

Increase £60 by 12%

$$12\% \text{ of } 60 = 0.12 \times 60 = £7.20 \\ \text{New amount} = £60 + £7.20 = £67.20$$

Fraction

Percent

Decimal

1	100%	1.0
$\frac{1}{2}$	50%	0.5
$\frac{1}{3}$	33.3%	0.33
$\frac{1}{4}$	25%	0.25
$\frac{1}{5}$	20%	0.2
$\frac{1}{6}$	16.6%	0.166
$\frac{1}{8}$	12.5%	0.125
$\frac{1}{10}$	10%	0.1
$\frac{1}{12}$	8.3%	0.083

Percentages

fraction to %

$$\frac{15}{20} = \frac{75}{100} = 75\% \\ \text{OR} \\ 15 \div 20 \times 100 = 75\%$$

0%

decreasing

decrease £60 by 12%

$$12\% \text{ of } 60 = 0.12 \times 60 = £7.20 \\ \text{New amount} = £60 - £7.20 = £52.80$$

SUBTRACT

without a calculator

50% - half

25% - half and half

75% - 50% + 25%

10% - divide by 10

5% - half 10%

20% - double 10%

Adding Fractions

Adding Fractions with Like Denominators

$$\frac{1}{7} + \frac{3}{7} \\ \frac{1+3}{7} \\ \frac{4}{7}$$

Add the numerators.
Denominator is unchanged.

Adding Fractions with Unlike Denominators

$$\frac{1}{8} + \frac{2}{3}$$

$$\text{Rewrite with common denominator} \\ 3 \times \frac{1}{8} + \frac{2 \times 8}{3 \times 8}$$

$$\frac{3}{24} + \frac{16}{24}$$

$$\frac{19}{24}$$

$$\text{Solve: } \frac{2}{6} \times \frac{9}{16}$$

Step 1. Multiply the top numbers:

$$\frac{2}{6} \times \frac{9}{16} = \frac{2 \times 9}{6 \times 16} = \frac{18}{96}$$

Step 2. Multiply the bottom numbers:

$$\frac{2}{6} \times \frac{9}{16} = \frac{2 \times 9}{6 \times 16} = \frac{18}{96}$$

Step 3. Simplify the fraction:

$$\frac{18}{96} = \frac{6}{32} = \frac{3}{16} \\ \text{Divided by 3} \\ \text{Divided by 2}$$

Written Methods for Division

SHORT DIVISION

$$\begin{array}{|c|c|} \hline 0 & 4 & 2 \\ \hline 6 & 2 & 5 & 2 \\ \hline 2 & 1 & 2 & 5 & 5 \\ \hline 2 & 2 & 5 & 1 & 0 \\ \hline \end{array}$$

SHORT DIVISION with remainders

$$\begin{array}{|c|c|} \hline 1 & 0 & 2 \\ \hline 8 & 8 & 1 & 6 \\ \hline \end{array}$$

LONG DIVISION

$$\begin{array}{|c|c|c|} \hline & 0 & 4 & 2 \\ \hline 6 & 2 & 5 & 2 \\ \hline & 2 & 4 & 0 \\ \hline & 0 & 1 & 2 \\ \hline & 0 & 1 & 2 \\ \hline & & & 0 \\ \hline \end{array}$$

This method relies on you being comfortable with multiples of your divisor (in this case, 6).

Example 1

$$(4 \times 7) + 3$$

So we need to evaluate the brackets first; $4 \times 7 = 28$

This is now $28 + 3 = 31$

Example 2

$$(6 + 4 - 3)^2 \times 4$$

So we need to evaluate the brackets first and we work left to right; $6 + 4 - 3 = 7$

This is now $7^2 \times 4 = 49 \times 4 = 196$

Example 3

$$4 - 8 \times 2 + 12 \div 4$$

So first we do the multiplication/division left to right; $4 - 16 + 3 = -9$

Now we do the addition/subtraction from left to right: $-12 + 3 = -9$

Dividing fractions – invert and multiply

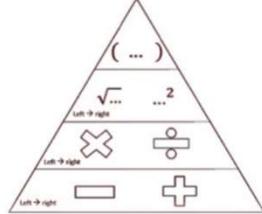
To divide fractions take the reciprocal (invert the fraction) of the divisor and multiply the dividend.

$$\text{Invert the fraction that you are dividing by} \\ \frac{4}{5} \div \frac{2}{3} = \frac{4}{5} \times \frac{3}{2}$$

$$\text{Multiply the numerators and denominators} \\ \frac{4}{5} \times \frac{3}{2} = \frac{12}{10}$$

$$\text{Simplify the fraction if necessary} \\ \frac{12}{10} = 1\frac{1}{5}$$

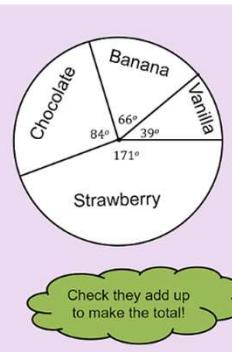
Order of Operations



Pie chart

The information in the pie chart shows sales of 120 ice-creams sold from an ice-cream van one Saturday afternoon in the summer. Calculate the number of each type sold.

Ice cream	Frequency	Angle
Banana	22	66°
Vanilla	13	39°
Strawberry	57	171°
Chocolate	28	84°
Total	120	360°



Pictograms

Method of Travel	Tally	Frequency
Walk		9
Bike		3
Car		6
Bus		12

WALK BIKE CAR BUS

= 2 people

Two Way Tables

Two way tables present data which is split into different categories.

Example 2: This two way table shows the Lunch options for the pupils in a school.
Complete the totals in the missing boxes.

	Year 10	Year 11	Totals
School Lunch	96	125	221
Packed Lunch	104	93	197
Totals	200	218	418

$$\text{Year 10 / School} \quad 221 - 125 = 96$$

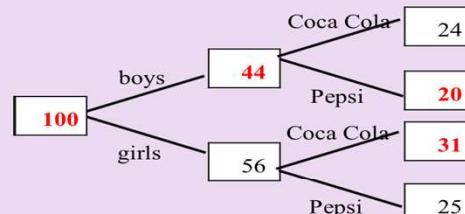
$$\text{Year 10 Total} \quad 96 + 104 = 200$$

$$\text{Year 11 / Packed} \quad 197 - 104 = 93$$

$$\text{Grand Total} \quad 221 + 197 = 418$$

Frequency trees

100 people were asked whether they prefer Coca Cola or Pepsi. Complete the frequency tree to show the information.



Algebra

Expanding single brackets

To expand a single bracket, multiply whatever is inside the bracket by the number outside.

Here is $x + 2$:

$$x$$

<

Higher Tier Only

Recurring Decimals to Fractions

- Let x = recurring decimal.
- Let n = the number of recurring digits.
- Multiply the recurring decimal by 10^n .
- Subtract (1) from (3) to eliminate the recurring part.
- Solve for x , expressing your answer as a fraction in its simplest form.

Examples:

0.7 (one recurring digit)

$$x = 0.7777\dots$$

$$10x = 7.777\dots$$

$$10x - x = 7$$

$$9x = 7$$

$$x = \frac{7}{9}$$

1.256 (two recurring digits)

$$x = 1.25656\dots$$

$$100x = 125.6565\dots$$

$$99x = 124.4$$

$$x = \frac{124.4}{99} = \frac{1244}{990} = \frac{622}{495}$$

Multiplying out two linear expressions

Expand & Simplify:

$$(x+3)(x-2)$$

$$\begin{array}{r} x \quad x + 3 \\ \times \quad x^2 + 3x \\ \hline -2 \quad -2x \quad -6 \end{array}$$

$$x^2 + 3x - 2x - 6$$

$$x^2 + x - 6$$

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Expand & Simplify:

$$(x+5)(x-3)$$

$$\begin{array}{r} x \quad x + 5 \\ \times \quad x^2 + 5x \\ \hline -3 \quad -3x \quad -15 \end{array}$$

$$x^2 + 5x - 3x - 15$$

$$x^2 + 2x - 15$$

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Expand & Simplify:

$$(x+5)(x-3)$$

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$$x^2 + 5x - 3x - 15$$

$$x^2 + 2x - 15$$

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Expand & Simplify:

$$(x+3)(x-2)$$

$$\begin{array}{r} x \quad x + 3 \\ \times \quad x^2 + 3x \\ \hline -2 \quad -2x \quad -6 \end{array}$$

$$x^2 + 3x - 2x - 6$$

$$x^2 + x - 6$$

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Expand & Simplify:

$$(x+5)(x-3)$$

$$\begin{array}{r} x \quad x + 5 \\ \times \quad x^2 + 5x \\ \hline -3 \quad -3x \quad -15 \end{array}$$

$$x^2 + 5x - 3x - 15$$

$$x^2 + 2x - 15$$

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Expand & Simplify:

$$(x+3)(x-2)$$

$$\begin{array}{r} x \quad x + 3 \\ \times \quad x^2 + 3x \\ \hline -2 \quad -2x \quad -6 \end{array}$$

$$x^2 + 3x - 2x - 6$$

$$x^2 + x - 6$$

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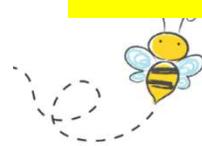
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FIND THE MIDPOINT

(3,4) (2,2)

$x_1 \quad y_1$ $x_2 \quad y_2$

$$(x,y)_{MDPT} = \left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2} \right)$$

$$= \left(\frac{3+2}{2}, \frac{4+2}{2} \right)$$

$$= (2.5, 3)$$

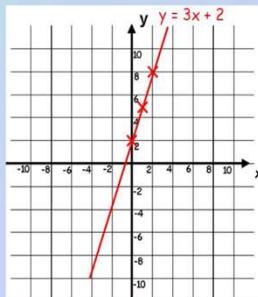
Plotting Straight Line Graphs

- To plot a graph, you need to know at least 3 points

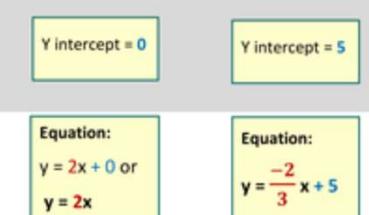
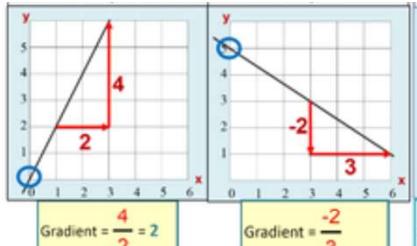
Plot a graph of the equation:

$$y = 3x + 2$$

Choose any values for x , what y value will



Equation of a line



TYPES OF GRAPHS

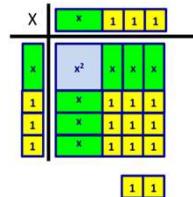
Knowing and being able to sketch the various types of graphs in Mathematics is vital. The following examples are standard graphs with their given names.

LINEAR GRAPH 	QUADRATIC CURVE 	CUBIC CURVE
EXPONENTIAL CURVE 	LOGARITHMIC CURVE 	RECIPROCAL CURVE
TRIGONOMETRICAL CURVES 		

Solving Quadratic Equations

Completing the square

Write $x^2 + 6x + 11$ in the form $(x + a)^2 + b$



Both factors are the same so you need to share your x terms equally between columns and rows.

The remainder 1s left over is the b term.

$$(x + 3)^2 + 2$$

Quadratic Formula

$$ax^2 + bx + c = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Examples:

$$3x^2 + 5x - 7 = 0$$

$$a = 3, b = 5, c = -7$$

$$x = \frac{-5 \pm \sqrt{(5)^2 - 4(3)(-7)}}{2(3)}$$

$$= \frac{-5 \pm \sqrt{25 + 84}}{6}$$

$$= \frac{-5 \pm \sqrt{109}}{6}$$

$$= \frac{-5 + \sqrt{109}}{6} \text{ or } \frac{-5 - \sqrt{109}}{6}$$

$$= 0.907 \text{ or } -2.573$$

$$-x^2 - 6x + 8 = 0$$

$$a = -1, b = -6, c = 8$$

$$x = \frac{-(-6) \pm \sqrt{(-6)^2 - 4(-1)(8)}}{2(-1)}$$

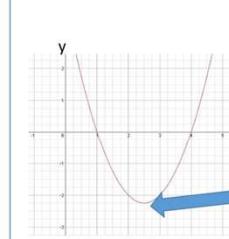
$$= \frac{6 \pm \sqrt{36 + 32}}{-2}$$

$$= \frac{6 \pm \sqrt{68}}{-2}$$

$$= \frac{6 + \sqrt{68}}{-2} \text{ or } \frac{6 - \sqrt{68}}{-2}$$

$$= -7.123 \text{ or } 1.123$$

Here are the graphs of $y = f(x)$ and $y = g(x)$

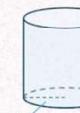


Here are the turning points. Here the gradients of the graphs are zero
 $(x \pm a)^2 - b$
 If $+a$ then x coordinate is $-a$
 If $-a$ then x coordinate is $+a$
 b is the y coordinate

Volume of Cylinders, Cones and Spheres

Cylinders

$$V = bh$$



Cones

$$V = \frac{1}{3} \pi r^2 h$$



Spheres

$$V = \frac{4}{3} \pi r^3$$



Find the volume of a cylinder with radius 3 and height 4. (Express in terms of π).

$$V = \pi r^2 h$$

$$V = \pi(3)^2(4)$$

$$V = \pi(9)(4)$$

$$V = 36\pi$$

L.G.9

Nothing that is measured can be 100% accurate. Whether you are using a ruler, a protractor, a thermometer or a set of kitchen scales, there will always be an error of \pm half the unit of accuracy used.

Find the volume of a cone with radius 3 and height 4. (Use 3.14 for π and round your answer to the nearest tenth).

$$V = \frac{1}{3} \pi r^2 h = \frac{1}{3}(3.14)(3)^2(4)$$

$$V = \frac{1}{3}(3.14)(36) = (12)(3.14)$$

$$V = 37.68 \quad V = 37.7$$

Find the volume of a sphere with radius 3. (Express in terms of π).

$$V = \frac{4}{3} \pi r^3 = \frac{4}{3} \pi(3)^3$$

$$V = \frac{4}{3} \pi(27) = 4\pi(9) \quad V = 36\pi$$

Accuracy and Calculations

Operation	Minimum value	Maximum Value
Addition	LB + LB	UB + UB
Subtraction	LB - UB	UB - LB
Multiplication	LB x LB	UB x UB
Division	LB/UB	UB/LB



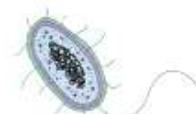
Science

Year 10 Biology: Infection and response 1

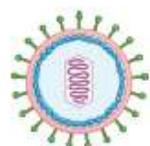
Communicable Disease

Pathogens are microorganisms that enter the body and cause communicable disease (infectious). Plants and animals can be infected by them.

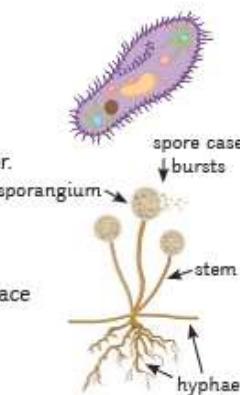
Bacteria are small cells that can reproduce very quickly in the body. They produce toxins that make you feel ill, damaging your cells and tissues.



Viruses are much smaller than bacteria; they can also reproduce quickly in the body. Viruses live inside your cell where they replicate. They then burst out of the cell, releasing new viruses.



Protists are eukaryotes (multicellular). Some are parasites which live on or inside other organisms, often carried by a vector.



Fungi are sometimes single celled, others have hyphae that grow and penetrate human skin and the surface of plants. They can produce spores which can spread to other plants.



How Pathogens Are Spread

Pathogens can be spread in many ways, for example:

Water – by drinking dirty water, e.g. cholera.

Air – carried by air and breathed in, e.g. influenza.

Direct contact – touching contaminated surfaces including the skin, e.g. athlete's foot.

Viral Diseases

Measles is spread by droplets of liquid from sneezes and coughs etc., symptoms include a red rash on the skin and a fever. Measles can be serious or even fatal, it can lead to pneumonia. Most people are vaccinated against measles when they are very young.

HIV is spread by sexual contact or exchanging body fluids. HIV can be controlled by antiviral drugs; this stops the viruses replicating. The virus attacks the cells in the immune system. If the immune system is badly damaged, the body cannot cope with other infections. This is the late stage and is called aids.

Tobacco mosaic virus affects plants, parts of the leaves become discoloured. This means plants cannot carry out photosynthesis; this will affect the plants growth.



Fungal and Protist Diseases

Fungal

Rose black spot shows as black spots on the leaves of the plant, this means less photosynthesis occurs. As a result, the plant does not grow as well. It is spread by the wind or the water. They can be treated by using fungicides and taking the leaves off the infected plant.

Protists

Malaria is caused by a protist, mosquitoes are the vectors. They become infected when they feed on an infected animal. The protist is inserted into the blood vessel. Malaria can cause fever, it can also be fatal.

Bacterial Diseases

Salmonella bacteria causes food poisoning. Symptoms include fever, stomach cramps, vomiting and diarrhoea. The symptoms are caused by the toxins produced by the bacteria. Food contaminated with salmonella can give you food poisoning. Most poultry in the UK will have had a vaccination against salmonella.

Gonorrhoea is a sexually transmitted bacterial disease, passed on by sexual contact. Symptoms include pain when urinating and thick yellow/green discharge from the vagina or penis. To prevent the spread, people should be treated with antibiotics and use a condom.

How to prevent the spread:

Being hygienic –

washing hands thoroughly.

Destroying vectors –

killing vectors by using insecticides or destroying their habitat.

Isolation –

isolating an infected person will prevent the spread.

Vaccination –

people cannot develop the infection and then pass it on.





Science

Year 10 Biology: Infection and response 2

Infection and Response Knowledge Organiser – Foundation and Higher

Fighting Diseases

Defence System

1. The skin acts as a barrier to pathogens.
2. Hairs and mucus in your nose trap particles.
3. The trachea and bronchi secrete mucus to trap pathogens. They also have cilia which move backwards and forwards to transport the mucus towards the throat. This traps any pathogens and the mucus is usually swallowed.
4. The stomach contains hydrochloric acid to kill any pathogens that enter the body via the mouth.

The Immune System

This kills any pathogens that enter the body.

White blood cells:

- Phagocytosis is when white blood cells engulf pathogens and then digest them.
- They produce antitoxins to neutralise the toxins.
- They also produce antibodies. Pathogens have antigens on their surface, antibodies produced by the white blood cells lock on to the antigen on the outside of the pathogen. White blood cells can then destroy the pathogens. Antibodies are specific to one antigen and will only work on that pathogen.



Vaccinations

Vaccinations have been developed to protect us from future infections. A vaccination involves an injection of a dead or weakened version of the pathogen. They carry antigens which cause your body to produce antibodies which will attack the pathogen. If you are infected again, the white blood cells can produce antibodies quickly.



Pros	Cons
Helps to control communicable diseases that used to be very common.	They don't always work.
Epidemics can be prevented.	Some people can have a bad reaction to a vaccine – however, that is very rare.

Fighting Disease – Drugs

Painkillers relieve the pain and symptoms, but do not tackle the cause.



Antibiotics kill the bacteria causing the problem, but do not work on viruses. Viruses are very difficult to kill because they live inside the body cells.



Developing Drugs

There are three main stages in drug testing:

- Pre-clinical testing:
1. Drugs are tested on human cells and tissues.
 2. Testing carried out on living animals.

Clinical testing:

3. Tested on healthy human volunteers in clinical trials. Starts with a very low dose, then tested on people with the illness to find the optimum dose.

Placebo is a substance that is like the drug, but does not do anything.

Placebo effect is when the patient thinks the treatment will work even though their treatment isn't doing anything.

Blind trial is when the patient does not know whether they are getting the drug or the placebo.

Double-blind trial is when both the doctor and the patient do not know whether they are getting the drug.

Drugs from Plants

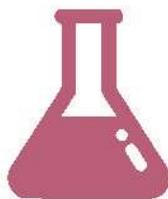
Chemicals produced by plants to defend themselves can be used to treat human diseases or help with symptoms.

Drug	Plant/Microorganism
aspirin	willow
digitalis	foxglove
penicillin	mould - penicillium

New drugs are now made by chemists, who work for the pharmaceutical industry, in laboratories.

Key Vocabulary

antibodies
antigens
antitoxins
bacteria
blind trial
double-blind
fungus
microorganism
phagocytosis
placebo
protist
toxins
vaccination
vector
virus



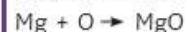
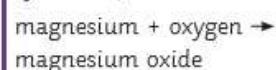
Science

Year 10 Chemistry: Quantitative 1

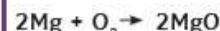
Conservation of Mass

No atoms can be created or made during a chemical reaction, so the mass of the reactants will equal the mass of the product.

Reactions can be shown as a word or symbol equation.



Symbol equations should also be balanced; they should have the same number of atoms on each side.



Concentration of Solutions

Concentration is the amount of a substance in a specific volume of a solution. The more substance that is dissolved, then the more concentrated the solution is.

It is possible to calculate the concentration of a solution with the following equation:

$$\text{concentration (g/dm}^3) = \text{mass (g)} \div \text{volume of solvent (dm}^3)$$

The equation can be rearranged to find the mass of the dissolved substance:

$$\text{mass (g)} = \text{concentration (g/dm}^3) \times \text{volume (dm}^3)$$

Relative Formula Mass

The relative formula mass is the sum of all the relative atomic masses of the atoms in the formula.

Examples:



$$A_r \text{ of H} = 1$$

$$A_r \text{ of Cl} = 35.5$$

$$1 + 35.5 = 36.5$$



$$A_r \text{ of H} = 1$$

$$A_r \text{ of S} = 32$$

$$A_r \text{ of O} = 16$$

$$(1 \times 2) + 32 + (16 \times 4)$$

$$2 + 32 + 64 = 98$$

Calculating Percentage Mass of an Element in a Compound

percentage mass of an element in a compound =

$$A_r \times \frac{\text{number of atoms of that element}}{M_r \text{ of the compound}}$$

Find the percentage mass of magnesium in magnesium oxide.

$$A_r \text{ of magnesium} = 24$$

$$A_r \text{ of oxygen} = 16$$

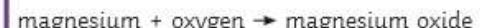
$$M_r \text{ of MgO} = 24 + 16$$

$$= 40$$

$$\% \text{ mass} = \frac{A_r}{M_r} = \frac{16}{40} = 0.4 \quad 0.4 \times 100 = 40\%$$

During a reaction the mass can change. If one of the reactants is a gas, the mass can go up.

E.g.

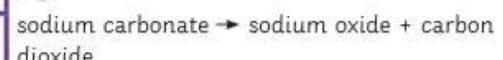


Oxygen from the air is added to the magnesium (making the product) which will be heavier in mass.



If one of the products is a gas, the mass can go down.

E.g.



When sodium carbonate is thermally decomposed, carbon dioxide gas is produced and released into the atmosphere.



Conservation of Mass

Show that mass is conserved in a reaction.



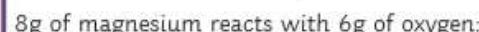
$$(2 \times 24) + (2 \times 16) \rightarrow 2(24 + 16)$$

$$48 + 32 \rightarrow 2 \times 40$$

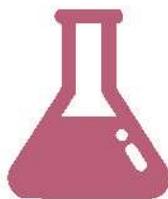
$$80 \rightarrow 80$$

Total M_r on the left-hand side of the equation is the same as the M_r on the right-hand side.

Calculate the mass of the product.



$$8 + 6 = 14\text{ g of magnesium oxide}$$



Science

Year 10 Chemistry: Quantitative 2

The Mole

The Avogadro constant, 6.02×10^{23} , is the number of molecules of a substance that make up one mole of that substance.

Iron has an A_r of 56, so 1 mole of iron has a mass of 56g.

Oxygen (O_2) gas has an M_r of 32, so 1 mole of oxygen has a mass of 32g.

Ammonia (NH_3) has an M_r of 17, so 1 mole of ammonia has a mass of 17g.

$$\text{number of moles} = \frac{\text{mass in g (of an element or compound)}}{M_r (\text{of the element or compound})}$$

Moles and Equations

Write a balanced symbol equation for the reaction in which 5.6g of iron reacts with 10.65g of chlorine to form iron chloride.

Work out the M_r of all the substances.

A_r of Fe = 56 and A_r of Cl = 35.5

Divide the mass of each substance by its M_r to calculate how many moles of each substance reacted or produced.

$$\text{moles Fe} = 5.6/56 = 0.1$$

$$\text{moles Cl} = 10.65/35.5 = 0.3$$

Divide by the smallest number of moles

$$\begin{array}{rcl} \text{Fe} & -0.1 & -1 \\ & \underline{0.1} & \end{array} \qquad \begin{array}{rcl} \text{Cl} & -0.3 & -3 \\ & \underline{0.1} & \end{array}$$

Write down the balanced symbol equation.



Chlorine exists as Cl_2 so the whole thing must be multiplied by 2.



Limiting Reactions

If one reactant gets used up in a reaction before the other, then the reaction will stop. The reactant that has been used up is limiting.

If you halve the amount of reactant then the amount of product will also be halved.





Science

Year 10 Physics: Electricity 1

Required Practical

Investigating Resistance in a Wire

Independent variable: length of the wire.

Dependent variable: resistance.

Control variables: type of metal, diameter of the wire.

Conclusion: As the length of the wire increases, the resistance of the wire also increases.

Investigating Series and Parallel Circuits with Resistors

Independent variable: circuit type (series, parallel).

Dependent variable: resistance.

Control variables: number of resistors, type of power source.

Conclusion: Adding resistors in series increases the total resistance of the circuit. In a parallel circuit, the more resistors you add, the smaller the resistance.

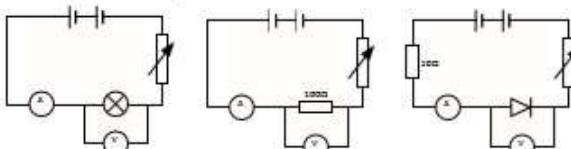
Investigating I-V Relationships in Circuits (Using a filament bulb, ohmic conductor, diode.)

Independent variable: potential difference/volts (V).

Dependent variable: current (A).

Control variable: number of components (e.g. 1 filament bulb, 1 resistor), type of power source.

Set up the circuits as shown below and measure the current and the potential difference.



Draw graphs of the results once collected.

Equations and Maths

Equations

$$\text{Charge: } Q = It$$

$$\text{Potential difference: } V = IR$$

$$\text{Energy transferred: } E = Pt$$

$$\text{Energy transferred: } E = QV$$

$$\text{Power: } P = VI$$

$$\text{Power: } P = I^2R$$

Maths

$$1\text{kW} = 1000\text{W}$$

$$0.5\text{kW} = 500\text{W}$$

Charge

Electric current is the flow of electric charge. It only flows when the circuit is complete.

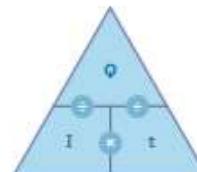
The **charge** is the current flowing past a point in a given time. Charge is measured in **coulombs (C)**.

Calculating Charge

charge flow (C) =

current (A) × time (s)

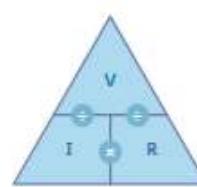
$$Q = It$$



potential difference =

current × resistance

$$V (V) = I (A) \times R (\Omega)$$



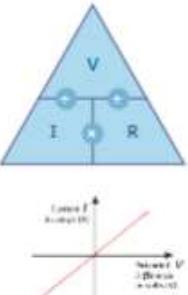
Resistance

$$\text{voltage (V)} = \text{current (A)} \times \text{resistance (\Omega)}$$

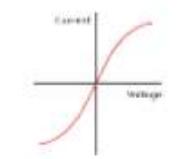
$$V = IR$$

Graphs of I-V Characteristics for Components in a Circuit

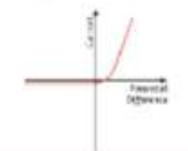
- Ohmic conductor:** the current is directly proportional to the potential difference - it is a straight line (at a constant temperature).



- Filament lamp:** as the current increases, so does the temperature. This makes it harder for the current to flow. The graph becomes less steep.



- Diode:** current only flows in one direction. The resistance is very high in the other direction which means no current can flow.



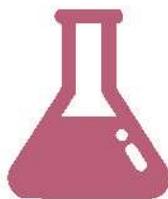
Current and Circuit Symbols

Current: the flow of electrical charge.

Potential difference (voltage): the push of electrical charge.

Resistance: slows down the flow of electricity.

cell		closed switch		fuse	
resistor		ammeter		LDR	
battery		voltmeter		LED	
variable resistor		bulb		thermistors	
open switch		diode			

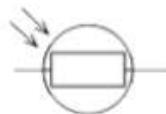


Science

Year 10 Physics: Electricity 2

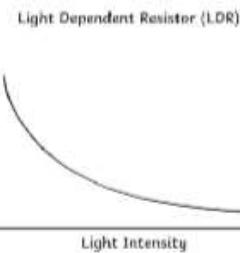
Circuit Devices

LDR – Light Dependent Resistor



An LDR is dependent on light intensity. In bright light the resistance falls and at night the resistance is higher.

Uses of LDRs: outdoor night lights, burglar detectors.

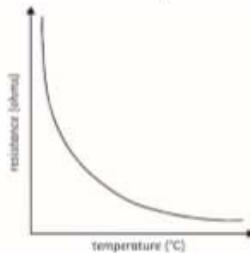


Thermistor



A thermistor is a temperature dependent resistor. If it is hot, then the resistance is less. If it becomes cold, then the resistance increases.

Uses of thermistors: temperature detectors.



Series and Parallel Circuits

Series Circuits

Once one of the components is broken then all the components will stop working.

Potential difference – the total p.d. of the supply is shared between all the components.

$$V_{\text{total}} = V_1 + V_2$$

Current – wherever the ammeter is placed in a series circuit the reading is the same.

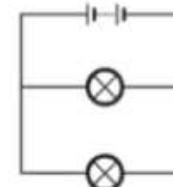
$$I_1 = I_2 = I_3$$

Resistance – In a series circuit, the resistance will add up to make the total resistance.

$$R_{\text{total}} = R_1 + R_2$$

Parallel Circuits

They are much more common - if one component stops working, it will not affect the others. This means they are more useful.



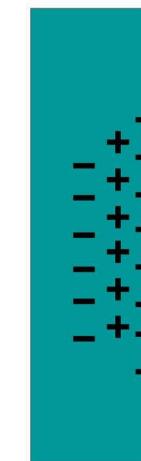
Potential Difference – this is the same for all components.

$$V_1 = V_2$$

Current – the total current is the total of all the currents through all the components.

$$I_{\text{total}} = I_1 + I_2 + I_3$$

Resistance – adding resistance reduces the total resistance.



Static Electricity

Static electricity is caused by separating and containing positive and negative charges. These charges are caused by moving electrons through friction.

Like charges attract.
Opposite charges repel.

Static charges can cause a spark which is dangerous.





History

Year 10 History Knowledge Organiser- The Treaty of Versailles

Year 10 Term 1 Knowledge Organiser

The end of the war

In November 1918, Germany was forced to ask for an **armistice**. She could no longer continue fighting. The USA had joined the war, the British blockade meant there were severe food shortages and some soldiers, towns & cities were **mutinying**. The war ended on 11th November 1918.

The aims of the Big Three

USA Woodrow Wilson	Great Britain David Lloyd George	France George Clemenceau
-----------------------	-------------------------------------	-----------------------------



- Didn't want to punish Germany, as this might cause another war in the future
- Wanted peace to be based on his 14 points, these included setting up a **League of Nations**
- Wanted countries & people to decide who ruled them (**self-determination**)



- Didn't want to punish Germany, too much as Britain needed to start trading with Germany again
- Wanted Germany's navy destroyed, so Britain was the strongest country again
- Wanted Germany destroyed, so she could never attack France again. Didn't want Germany to have any army or any way to protect itself
- Wanted **reparations** to pay for the damage France had suffered

The terms of the Treaty of Versailles

Military: Germany's army could only have 100,000 men

The navy was reduced to 15,000 men, 6 battleships and no submarines

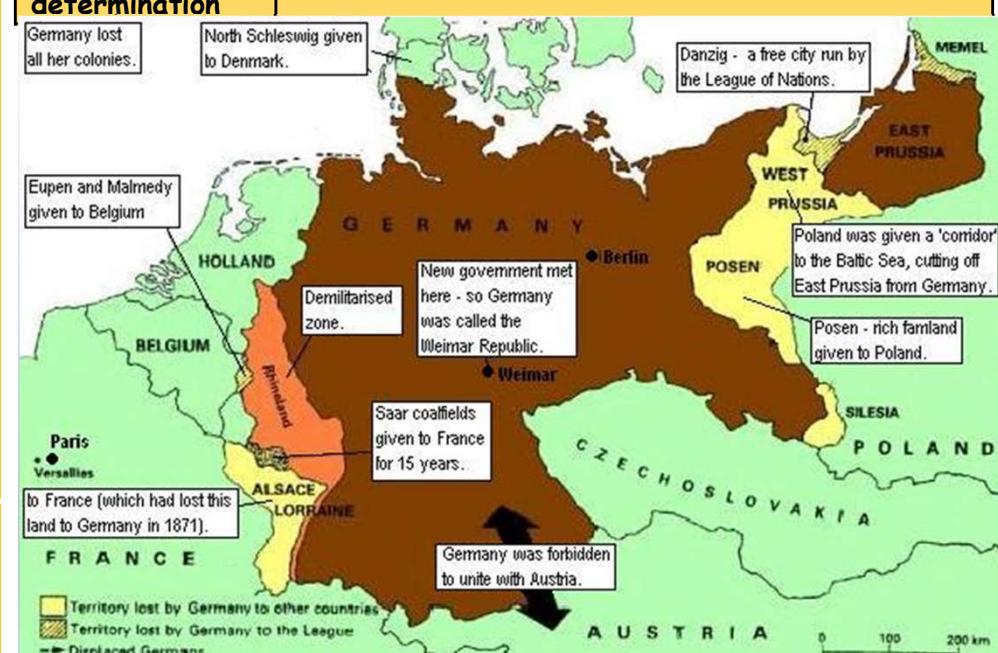
Germany could not have an air force

War guilt: Germany had to accept responsibility for starting the war

Money: Germany had to pay reparations of £6.6 billion to the allies

Colonies: Germany's colonies were given to the League of Nations, who gave them to Britain & France to run as **mandates**

Key Terms	Definitions
Armistice	The agreement to stop the war on 11 th November 1918
Paris Peace Conference	The meeting where the winners of the war met to decide what should happen to Germany
The Big Three	Britain, France & Germany
The Treaty of Versailles	The peace treaty, signed in June 1919 by Germany and the winners
Mutinying	Refusing to obey the orders of the people in charge
Reparations	Money to pay for
League of Nations	An organisation which would work for world peace
Mandates	Countries which are looked after by another until they can become independent
Self-determination	When a country or group of people rule themselves



Territorial losses

Germany lost a significant amount of land (10%).



History

How did the Germans view the Treaty?

They hated it & thought it was very unfair because:

- Many Germans didn't realise that they were actually losing the war & believed that they could have continued fighting. They blamed the new German government for their defeat. The new government was nicknamed 'the November Criminals'.
- The Kaiser had been forced to abdicate, so people thought the person who was to blame had been punished.
- None of their allies were punished as harshly.
- It would be very difficult for Germany to recover from the war & pay off the reparations. Areas like the Saar with its coal fields were needed to fuel German factories, but this are now belonged to France.
- Many Germans were not given the right to self-determination e.g. those living in the Polish Corridor
- Germany felt defenceless, as they were surrounded by enemies & had a tiny army.
- They had no choice but to sign it - it was a diktat

The USA's attitude

Many Americans wanted to return to isolationism. The Republican Party criticised Woodrow Wilson and the Senate refused to ratify the treaty. The USA failed to join the League of Nations.

The other peace treaties

St Germain: signed by Austria. Land lost to Italy, Yugoslavia & Poland, reparations to be paid, but total never fixed, army reduced to 30,000.

Neuilly: signed by Bulgaria. Land lost to Yugoslavia, Greece & Romania, £100m reparations, army limited to 20,000, no air force.

Trianon: signed by Hungary. Land lost to Romania, Czechoslovakia & Yugoslavia, Agreed reparations should be set but no amount agreed, 30,000 in army, no conscription.

Sevres: signed by Turkey. Land lost to Greece, army restricted to 50,000, 7 sail boats & 6 torpedo boats in the navy.

Lausanne: signed by Turkey (the Turkish people revolted after hearing the terms of Sevres), Turkey regained some of the land Greece had taken & reparations cancelled.

Key Terms	Definitions
Anschluss	The union of Germany & Austria. This was forbidden in the Treaty of Versailles.
Abdicate	When a ruler gives up their throne
Diktat	A forced treaty
Isolationism	The policy where a country doesn't get involved in foreign affairs

How satisfied were the Big Three?

	Liked	Disliked
Britain	Many people thought it was fair but could have been harsher. GB gained Germany's colonies. Germany's navy was restricted.	Lloyd George worried that reparations were too harsh, GB needed to start trading with Germany quickly.
France	Pleased with the demilitarisation of the Rhineland, as France had more protection. Reparations & control of the Saar.	Many felt the treaty should have been harsher. Clemenceau was angry that Germany still had an army & wanted more reparations.
USA	The League of Nations was created. Some countries were given self-determination.	Many felt the treaty was too harsh & might cause problems in the future.

Why can the treaty be seen as fair?

It was normal for the losers to agree to harsh terms. Russia left the war in 1917 & had to give Germany more than $\frac{1}{4}$ of its land. Someone had to pay for the damage, it was only right the losers should pay.



History

Year 10 History Knowledge Organiser- The League in the 1920s

The League

Aim: stop war breaking out again, encourage disarmament, improve working conditions & tackle deadly diseases

Members: 42 at first, but no USA (didn't want to join) Germany or Russia (not allowed to join).

Collective security: idea that all countries would work together to keep the peace.

If disputes broke out: the **Covenant** set put how the League would deal with aggression:

- **Mitigation:** getting countries together to talk through problems
- **Moral condemnation:** telling countries off
- **Economic sanctions:** members of the League wouldn't trade with the offender.

The League didn't have its own army, it had to borrow men from its members.

The structure of the League

Assembly: every member sent a representative to the Assembly which met once a year. Decisions has to be unanimous. It made decisions such as when a new country could join & how the League's money was spent.

Council: met more frequently than the Assembly & dealt with emergencies. 4 main members, GB, France, Japan & Italy & 4 non-permanent. Had the power of **veto** over decisions made by the Assembly.

Permanent Court of International Justice: settled international arguments. It listened to the evidence but counties did not have to follow its rulings.

Secretariat: was in charge of administration.

Special commissions: special groups which tackled specific issues e.g.

International Labour Organisation: wanted to improve working conditions. It recommended the banning of lead in paint but couldn't stop children under 14 working.

Slavery Commission: set 200,000 people free in Sierra Leone.

Key Terms	Definitions
Covenant	An agreement which set out the League's aims & what its members could expect
Veto	The right to overrule a decision
Plebiscite	When the people vote on an issue

Vilna 1920

- Poland took control of the capital of Lithuania, Vilna.
- Lithuania appealed to the League for help.
- The League told Poland to remove its army, it didn't.
- The league didn't do anything else, as France saw Poland as an ally against Germany.



Upper Silesia 1921-25

- 1921: a **plebiscite** was held to decide if the area should be German or Polish. Germany won 60% of the vote but Poland claimed that many of the people who had voted for Germany no longer lived there.
- The area was split based on which parts had voted for which country.
- Germany received most of the rural areas, but lost $\frac{3}{4}$ of their coal mines.
- Poland received the industrial areas, but $\frac{1}{2}$ million Poles were in the German territory.



LEAGUE OF NATIONS



SOCIETE DES NATIONS



A British cartoon from December 1919 called 'The Gap in the Bridge'.



History

Key Terms	Definitions
Disarmament	The reduction of weapons

Aaland Islands 1921

- Sweden & Finland both claimed them
- The League gave them to Finland but they couldn't build forts on the islands
- Sweden agreed.



Corfu 1923

- Tellini, an Italian general was murdered whilst surveying the borders of Greece & Albania.
- Mussolini (the Italian leader) blamed the Greek government & demanded the murderers should be executed & he should receive compensation.
- He invaded Corfu.
- Greece appealed to the League, who condemned Italy but said that Greece should pay compensation.
- Mussolini complained to the Conference of Ambassadors. They force Greece to pay compensation.



Bulgaria 1925

- Greek soldiers killed on the border of Greece & Bulgaria.
- Greece invaded Bulgaria
- Bulgaria asked the League for help. The League told the Greeks to withdraw & pay compensation.
- Greece thought this was unfair as Mussolini had done the same thing in 1923 & got away with it. But Greece was too small to stand up to the League.



The Wall Street Crash 1929

- The Crash turned into a world wide depression.
- Countries had little money to spend on world wide problems & were more concerned with sorting out their own issues.
- Some countries turned to extremist parties such as the Nazis in Germany



What international agreements were made in the 1920s?

1925: Locarno Treaties. Signed between France, Germany, GB & others. Germany accepted the borders Versailles had set out, the countries agreed not to go to war & work together peacefully.

1928: Kellogg-Briand Pact. 65 countries agreed not to use war to settle disputes.

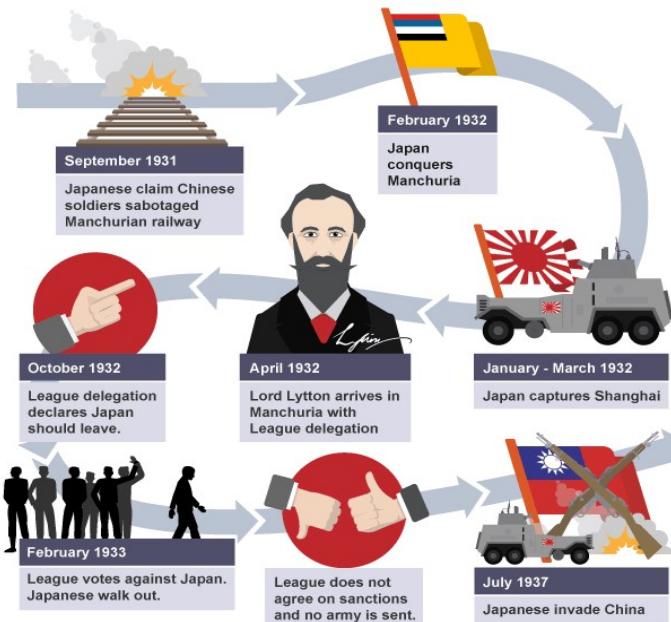
1921-22: Washington Arms Conference. GB, France & others attended. Discussed how big navies could be, Japan agreed to have a smaller navy than the USA & GB.

1922: Rapallo Treaty. Germany agreed to return the money & land Russia had lost in the 1917 peace treaty.

Result: failure for the League as it was not involved in any of these agreements.



History



Manchuria 1931

Japan had been badly affected by the Great Depression (sales to the USA of silk had dropped), she wanted to protect the industries & South Manchurian Railway which it already controlled in the area & the Japanese army was getting stronger and had started to take more aggressive action.

What did the League do?

Issued a moral condemnation & told Japan to withdraw its troops. But there was little the League could do as:

- Japan was far away & many countries were too busy dealing with their own problems caused by the Great Depression.
- Economic sanctions were pointless, as Japan would continue trading with the USA.
- The USSR was not a member of the League & could not be asked to help even though it was the nearest country.

Results

Even though the Lytton Report said Japan was in the wrong, Japan ignored it & left the League. Japan was a permanent member of the Council.

BUT many people still believed that if there was an issue in Europe, then the League would still deal with it successfully.

However, Mussolini & Hitler began to wonder if they might get around the League as well.

What happened in Abyssinia?

December 1934: Italian soldiers clashed with Abyssinians at Wal Wal. 150 Abyssinians killed & 2 Italians.

Jan 1935: French foreign minister, Pierre Laval met with Mussolini & made secret agreements which would let Mussolini do what he wanted in Abyssinia.

Jun 1935: Abyssinian emperor, Haile Selassie asked the League for help

Oct 1935: Italy invaded, despite a moral condemnation issued by the League.

Dec 1935: Hoare-Laval Pact agreed.

May 1936: Abyssinian capital, Addis Ababa captured

Why did the League fail in Abyssinia? The Hoare-Laval Pact

GB & France's foreign ministers Pierre Laval & Samuel Hoare decide that Italy would be given half of Abyssinia. Italy would be given the fertile areas. This plan was not discussed with Italy or Abyssinia.

The Hoare-Laval Pact was made public in the newspapers. Both men were forced to resign.

Why did the League fail in Abyssinia? Suez Canal

Mussolini would need to send troops & supplies around the coast of Africa if the Suez Canal was shut. This would make his invasion very difficult. GB & France kept the canal open.

Why did the League fail in Abyssinia? Trade sanctions

Italy: the sanctions imposed did not cover oil, steel, iron or coal (GB didn't want its coal mining industry affected) & the League felt Italy would just trade with the USA & USSR.

Abyssinia: the League banned members from selling arms (weapons) to Abyssinian & Italy. Abyssinian had nothing to defend itself with.

Results

- May 1936: Italy left the League. This left only GB, France & the USSR (who joined in 1934) to run the League.
- GB & France had shown they were more concerned about their own welfare than protecting the League.
- Aggressive dictators like Hitler & Mussolini realised the League wouldn't stop them.



History

The League had no army

Evidence: when Japan ignored the League over Manchuria, there was nothing the League could do.



Weak sanctions

Evidence: Powerful countries were not scared of moral condemnation, so the League's sanctions were useless.



Self-interest of dominant countries

Evidence: GB & France were more concerned about keeping Mussolini as an ally against Hitler to do anything about the invasion of Abyssinia.



Absence of powerful countries

Evidence: The USA refused to join & Germany & the USSR were not allowed to at the beginning. This meant that trade sanctions were ineffective, as the aggressor could trade with them. In the Manchuria Crisis, the USSR was the nearest country to China.



Slow & inefficient decision making

Evidence: The League only met once a year; the Council could veto proposals & decisions had to be unanimous. This made decision making slow. The League was slow to act in the Manchurian Crisis.



The Great Depression

Evidence: The Great Depression meant countries were more concerned with their own problems. The Depression meant that people turned to extremist dictators such as Hitler & Mussolini who were keen to invade other countries. Hitler invaded more & more countries & the League didn't do anything about it.





History

Hitler's aims

- Overturn the Treaty of Versailles
- Make Germany strong again
- Take Lebensraum
- Unite Volkesdeutsch & create a Greater Germany
- Unite Austria & Germany in Anschluss
- Destroy communism



1933: Hitler leaves the League of Nations

Disarmament Conference

Hitler offered to disarm as long as everyone else did. France refused. Hitler left the League

Jan 1935: Saar Plebiscite

Saar given to France for 15 years in Versailles. Plebiscite held to decide if the area remained French or returned to Germany. 90% of the population voted to re-join Germany

April 1935: Stresa Front

Agreement between GB, France & Italy to stop Hitler from breaking any more terms of Versailles.

1934: The Dollfuss Affair (attempted Anschluss)

Austrian Chancellor, Dollfuss banned the Nazi Party in 1934. Hitler told Austrian Nazis to cause chaos. Dollfuss murdered. Mussolini moved troops to the border, promising to stop Anschluss. Hitler was forced to back down.

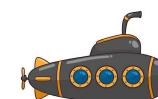
1935: Rearmament

Hitler reintroduced conscription, announced he was building an air force (both banned by Versailles). No one tried to stop him.



June 1935: Anglo-German Naval Agreement

GB agreed Hitler could build his navy to 35% of GB's & submarines to 45%. GB didn't consult France & Italy before signing it.



Key Terms

Definitions

Remilitarisation

Rebuilding stores of weapons and troops or sending troops back into an area where they were banned

Key Terms	Definitions
Lebensraum	Living space in the east
Volkesdeutsch	People with German blood, but without German citizenship
Communism	The left-wing political idea that all people are equal & wealth should be shared equally
Plebiscite	A vote by all the people

March 1936: Remilitarisation of the Rhineland

Hitler sent troops into the Rhineland after the Franco-Soviet pact was signed (France & the USSR agreed to support each other if attacked by Germany). Hitler claimed Germany was threatened on both sides & needed to remilitarise the area.

Why didn't other countries react to the remilitarisation of the Rhineland?

Britain: many people felt Germany had the right to protect its own borders & was reclaiming what was rightfully theirs. GB was already dealing with the Abyssinian Crisis.

France: concerned with its own internal problems & Abyssinia. French generals also believed the German invasion force was much bigger than it was & weren't prepared to risk fighting.

The League: focused on Abyssinia.

Results of the remilitarisation:

- Hitler grew in confidence & started to plan his next move.
- GB & France started to rearm.
- Mussolini & Hitler signed the Rome-Berlin Axis, as Mussolini thought Hitler was a force to be reckoned with.



History



Anschluss

1934: Schuschnigg becomes leader of Austria. He did a deal with the Nazis to keep him in power. In return they were given key positions in the Austrian government.

Jan 1938: plans discovered for Schuschnigg's assassination.

Schuschnigg met with Hitler. He 'agreed' to appoint the Nazi, Seyss-Inquart as minister for the interior, with full power over the police. If Schuschnigg didn't agree, Hitler would invade.

When Schuschnigg returned to Austria he decided to hold a plebiscite. If the people voted against Anschluss, Hitler would not be able to invade.

11 March 1938: Hitler demanded the plebiscite be postponed. Schuschnigg agreed, Hitler then forced him to resign. Seyss-Inquart became chancellor.

12 March 1938: Nazi troops invaded Austria. Mussolini did nothing.

10 April: plebiscite held. 99% voted in favour of Anschluss.

The Sudetenland: How did Hitler take over?

The German speakers in the Sudetenland claimed they were being persecuted by the Czechs. They started rioting.

May 1938: Hitler said he needed to step in to save the German-speakers in the area.

Sept 1938: the British prime minister, Neville Chamberlain flew to Germany to meet Hitler. Chamberlain agreed to let Hitler have the area, as long as this happened peacefully.

Chamberlain met with the Czechs & forced them to agree.

22nd Sept 1938: Chamberlain returned to Germany & Hitler told him that he wanted the Sudetenland by 1st Oct. This was not what had been agreed at first.

29th Sept 1938: Munich Conference held. GB, France, Italy & Germany agreed to give Germany the Sudetenland. The Czech government was not consulted.

15th March 1939: Hitler took over the rest of Czechoslovakia.

Results of Anschluss:

Germany became stronger, Hitler had united more German speakers. Austria was also rich in natural resources such as steel & iron. It was a propaganda success for Hitler.

GB: many people didn't want another war, so didn't want to get involved.

France was dealing with its own problems & didn't get involved.

Czechoslovakia: the Czech government was very worried as they knew Czechoslovakia would be next on Hitler's list. France agreed to support them if Hitler attacked.

Chamberlain, the British prime minister asked Hitler what he intended to do to Czechoslovakia. Hitler gave his word of honour that Czechoslovakia was safe.

Why did Hitler target the Sudetenland?

- Czechoslovakia established by Versailles - Hitler had promised to overturn this treaty.
- The Sudetenland could help Hitler's war effort as it had factories which produced weapons, tanks & glass
- 3 million German speaking people lived there.
- If Hitler controlled the area, he could then attack the rest of Czechoslovakia.





History



Why did Chamberlain act this way?

He was following the policy of **appeasement** - trying to avoid war by giving Hitler what he wanted.

Results:

- The USSR was not consulted & Stalin felt betrayed & angry. Hitler was getting closer to the USSR & Stalin started to look for ways to protect the USSR.
- Chamberlain believed that he had achieved 'peace in our time', as Hitler had agreed never to go to war with GB in the Anglo-German declaration
- This was the first time Hitler had invaded a country which he had no right to & he had got away with it.
- Chamberlain promised Poland that if it was attacked GB would help it

Arguments for appeasement

- Many people felt the Treaty of Versailles had been too harsh on Germany & it was only fair to let Hitler overturn parts of it.
- People were terrified there would be another major war.
- The Great Depression meant countries could not afford to go to war.
- People were more scared of communism than Hitler. They thought a strong Germany would stop Stalin.
- Hitler said he was a man of peace & they believed him.

Arguments against appeasement

- If countries had acted earlier against Hitler, it might not have ended up in a war.
- The more Hitler took, the more confidence he became.
- Appeasement was morally wrong, it left countries like Austria & Czechoslovakia on their own.
- Appeasement** angered Stalin as he was left out & felt that the USSR might be next. He could have been a powerful ally.

Results:

- Stalin didn't trust Hitler, but the Pact bought him time to prepare for war.
- Territory in Poland would be a buffer between Germany & the USSR, which would be useful if Hitler did invade.
- Hitler now knew he could invade Poland without having to fight on 2 fronts.
- The Pact made the British people realise that war was imminent. They confirmed their previous agreement that if Hitler invade Poland Britain would fight.

Key Terms	Definitions
Sudetenland	An area of Czechoslovakia which was on the border with Germany
Appeasement	The policy of giving someone what they wanted in the hope of avoiding war
Stalin	The leader of the USSR
Anglo-German declaration	The agreement between GB & Germany not to go to war
Nazi-Soviet Pact	Agreement between Germany & the USSR to split Poland between them.

Why was the Nazi-Soviet Pact signed?

- Both Hitler & Stalin hated Poland & wanted its territory.
- The USSR had joined the League in 1934, but Stalin had seen how weak it had been over Manchuria & Abyssinia. He didn't believe it would protect the USSR if Hitler invaded it.
- 23rd August 1939: Nazi-Soviet Pact signed between them.
- GB & France had allowed Germany to become stronger, so that it could act as a barrier against communism. If they didn't trust Stalin, why should he trust them?
- Stalin was not invited to attend the Munich Conference.
- Hitler would not have to fight a war on 2 fronts (like in the WW1).
- When war broke out, the USSR would be on Germany's side, not GB & France's.

What was agreed in the Nazi-Soviet Pact?

- Poland would be split between Germany & Poland, Hitler would do all the fighting.



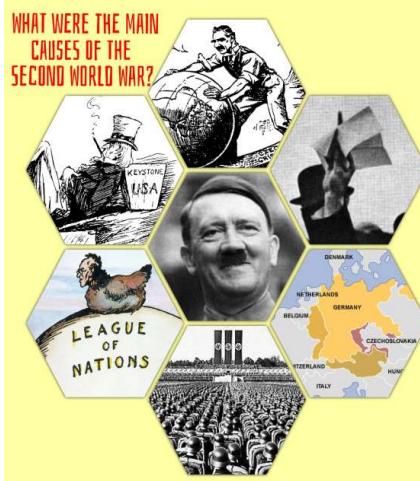
History

The invasion of Poland

1st Sept 1939: Hitler invaded Poland.

3rd Sept: the British sent an ultimatum to Germany. If Germany didn't send assurances that its army would be withdrawn from Poland by 11am, then Britain would declare war. There was no reply.

Britain declared war on Germany, France followed suit.



What were the causes of the Second World War?

The Treaty of Versailles: too harsh, Hitler promised to get rid of it & reunite the German speaking people. Many people in Germany felt by the 1930s it was too harsh & Germany had the right to overturn it.

Hitler: He wanted to overturn the Treaty of Versailles, so he had to invade other countries.

The failure of the League of Nations: Failed in Manchuria & Abyssinia which showed the League was weak, GB & France would undermine the League & because it didn't have an army it couldn't act.

The Depression: countries were busy with their own problems & didn't want to get involved in international issues. Desperate people turned to extremist leaders such as Hitler & Mussolini & the League couldn't help.

Appeasement: Opportunities to stop Hitler early on were missed.

Politicians such as Chamberlain made a mistake trusting Hitler & the Munich Agreement pushed Stalin into an alliance with Hitler.

The Nazi-Soviet Pact: Allowed Hitler to invade Poland which GB & France had promised to defend. It meant Hitler did not have to fight on 2 fronts.

Key Terms	Definitions
Ultimatum	A final demand

Key people:

- David Lloyd George:** British prime minister. Member of the 'Big Three' at Versailles.
- George Clemenceau:** French prime minister. Member of the 'Big Three'.
- Woodrow Wilson:** American president. Member of the 'Big Three'.
- Benito Mussolini:** dictator of Italy. Involved in Corfu incident, invaded Abyssinia & ally of Hitler's.

- Lord Lytton:** sent by the League to investigate the events in Manchuria. Author of the Lytton Report which stated Japan was in the wrong.
- Sir Samuel Hoare & Pierre Laval:** British & French foreign ministers. Conducted secret talks with Mussolini to find a solution to the Abyssinia crisis. Both men forced to resign when it became public that they planned to give half of Abyssinia to Italy.
- Adolf Hitler:** German dictator. Promised to overthrow the Treaty of Versailles.
- Dollfuss:** Austrian Chancellor murdered in 1934. Hitler tried to unite Austria & Germany after his death.
- Schuschnigg:** replaced Dollfuss as Austrian chancellor, tried to hold a plebiscite to prevent Hitler from achieving Anschluss, forced to resign in 1936.
- Seyss-Inquart:** A Nazi who Schuschnigg was forced to appoint as minister of interior in 1938. Became Austrian chancellor.
- Joseph Stalin:** leader of the USSR, signed Nazi-Soviet Pact.
- Neville Chamberlain:** British prime minister, followed a policy of appeasement towards Hitler during the 1930s.



Geography Year 10, Term 1 The Challenge of Natural Hazards

Knowledge Organiser

Key Terms

Tectonic Hazard: Issues which arise from the movement of tectonic plates – e.g. volcanic eruptions or earthquakes

Atmospheric Hazards: Issues which arise from weather systems

Geomorphological Hazards: Issues which involve the features of the earth's surface, such as river flooding

Biological Hazards: Issues which involve living organisms, such as forest fires

Natural Disaster: When a natural hazard has a significant impact on humans and/or property

Extreme Weather: Weather which is significantly different from the long-term climate averages for an area

Plate Margin: The point at which two tectonic plates meet. Can be constructive (moving away), destructive (moving together) or conservative (sliding side-by-side)

Richter Scale: The unit of measurement used to show the force (magnitude) of an earthquake. It's a logarithmic scale.

Seismograph: The machine used to measure the movement of the earth

Geothermal Energy: Energy harnessed by heating water in thin areas of the earth's crust. Can be used as hot water (instead of heating it at home) or steam used to drive turbines and generate electricity

Monitoring: Looking carefully at and measuring natural features. Taking action should they seem to be becoming active or likely to cause a natural hazard/disaster

Prediction: Using statistical models or scientific evidence to predict when a natural hazard is likely to take place

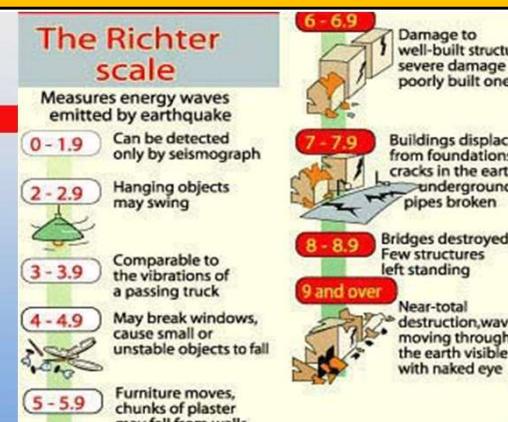
Planning: Taking action to prepare an area for a natural hazard/disaster. For example, earthquake-proof buildings like the Transamerica Tower in San Francisco

Hurricane: A tropical revolving storm, also known as a typhoon or a cyclone

Saffir-Simpson Hurricane Wind Scale: The five-category system of measuring the strength of a tropical revolving storm

Storm Surge: The rise in ocean level during a hurricane event. Causes flooding in coastal/low-lying areas

SAFFIR-SIMPSON HURRICANE WIND SCALE		
CATEGORY	WIND SPEED	DAMAGE
1	74-95 mph	Very dangerous winds will produce some damage
2	96-110 mph	Extremely dangerous winds will cause extensive damage
3	111-129 mph	Devastating damage will occur
4	130-156 mph	Catastrophic damage will occur
5	156+ mph	Catastrophic damage will occur

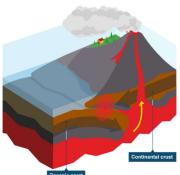
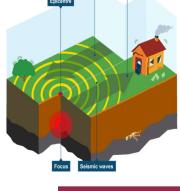
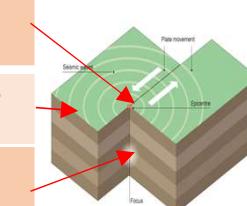




Geography

at Da Vinci Academy

Convection Currents	
The crust is divided into tectonic plates which are moving due to convection currents in the mantle.	
1	Radioactive decay of some of the elements in the core and mantle generate a lot of heat.
2	When lower parts of the mantle molten rock (Magma) heat up they become less dense and slowly rise .
3	As they move towards the top they cool down, become more dense and slowly sink .
4	These circular movements of semi-molten rock are convection currents
5	Convection currents create drag on the base of the tectonic plates and this causes them to move.
LIC –Case Study: Nepal 2015	
Causes R7.8 magnitude earthquake struck the Gorkha district just 80km northwest of Kathmandu, the capital city. 25 April 2015.	
Effects Primary: 9000 deaths and 1700 injuries. Historic buildings and temples were destroyed. 26 hospitals and half of all schools were destroyed. Secondary: Triggered avalanches on Mt. Everest where 19 tourists and sherpas died	
Management Immediate Responses: International aid, \$126million from UK alone. Temporary shelters were set up and water cleansing stations established. Longer term responses included using UN and World Bank money to repair damaged buildings and tourism resources	

The structure of the Earth		Volcanic Hazards	
The Crust	Varies in thickness (5-10km) beneath the ocean. Made up of several large plates.	Ash cloud	Small pieces of pulverised rock and glass which are thrown into the atmosphere.
The Mantle	Widest layer (2900km thick). The heat and pressure means the rock is in a liquid state that is in a state of convection.	Gas	Sulphur dioxide, water vapour and carbon dioxide come out of the volcano.
The Inner and outer Core	Hottest section (5000 degrees). Mostly made of iron and nickel and is 4x denser than the crust. Inner section is solid whereas outer layer is liquid.	Lahar	A volcanic mudflow which usually runs down a valley side on the volcano.
		Pyroclastic flow	A fast moving current of super-heated gas and ash (1000°C). They travel at 450mph.
		Volcanic bomb	A thick (viscous) lava fragment that is ejected from the volcano.
Types of Plate Margins		What is a Natural Hazard	
Destructive Plate Margin		A natural hazard is a natural process which could cause death, injury or disruption to humans, property and possessions.	
When the denser plate subducts beneath the other, friction causes it to melt and become molten magma . The magma forces its ways up to the surface to form a volcano. This margin is also responsible for devastating earthquakes .		Geological Hazard	Meteorological Hazard
		These are hazards caused by land and tectonic processes.	These are hazards caused by weather and climate.
Constructive Plate Margin		Causes of Earthquakes	
Here two plates are moving apart causing new magma to reach the surface through the gap. Volcanoes formed along this crack cause a submarine mountain range such as those in the Mid Atlantic Ridge .		Earthquakes are caused when two plates become locked causing friction to build up. From this stress , the pressure will eventually be released, triggering the plates to move into a new position. This movement causes energy in the form of seismic waves , to travel from the focus towards the epicentre . As a result, the crust vibrates triggering an earthquake.	
Conservative Plate Margin			
A conservative plate boundary occurs where plates slide past each other in opposite directions, or in the same direction but at different speeds. This is responsible for earthquakes such as the ones happening along the San Andreas Fault, USA.			
SEISMIC WAVES (energy waves) travel out from the focus.			
The point directly above the focus, where the seismic waves reach first, is called the EPICENTRE .		The point at which pressure is released is called the FOCUS .	



Managing Volcanic Eruptions	
Warning signs	Monitoring techniques
Small earthquakes are caused as magma rises up.	Seismometers are used to detect earthquakes.
Temperatures around the volcano rise as activity increases.	Thermal imaging and satellite cameras can be used to detect heat around a volcano.
When a volcano is close to erupting it starts to release gases.	Gas samples may be taken and chemical sensors used to measure sulphur levels.
Preparation	
Creating an exclusion zone around the volcano.	Being ready and able to evacuate residents.
Having an emergency supply of basic provisions, such as food	Trained emergency services and a good communication system.

Earthquake Management
PREDICTING
Methods include:
<ul style="list-style-type: none"> Satellite surveying (tracks changes in the earth's surface) Laser reflector (surveys movement across fault lines) Radon gas sensor (radon gas is released when plates move so this finds that) Seismometer Water table level (water levels fluctuate before an earthquake). Scientists also use seismic records to predict when the next event will occur.
PROTECTION
You can't stop earthquakes , so earthquake-prone regions follow these three methods to reduce potential damage:
<ul style="list-style-type: none"> Building earthquake-resistant buildings Raising public awareness Improving earthquake prediction



HIC – Case Study: Amatrice, Italy, 2016
Causes
R6.2 magnitude earthquake struck the area which was 150km northeast of Rome, the capital city. 24 August 2016
Effects
Primary: 299 people killed and 400 injured. The town of Amatrice, including its church and school were destroyed. Damage estimated to be 22 Billion Euros Secondary: Farmers struggled to work as their barns and milking equipment were destroyed. Some areas closed
Management
Immediate Responses: 5000 Italian soldiers lead the rescue effort and Facebook was used to try to account for the victims and mark people 'safe'. Long term: Students had to attend neighbouring schools and loans were offered to rebuild people's homes





Geography

at Da Vinci Academy

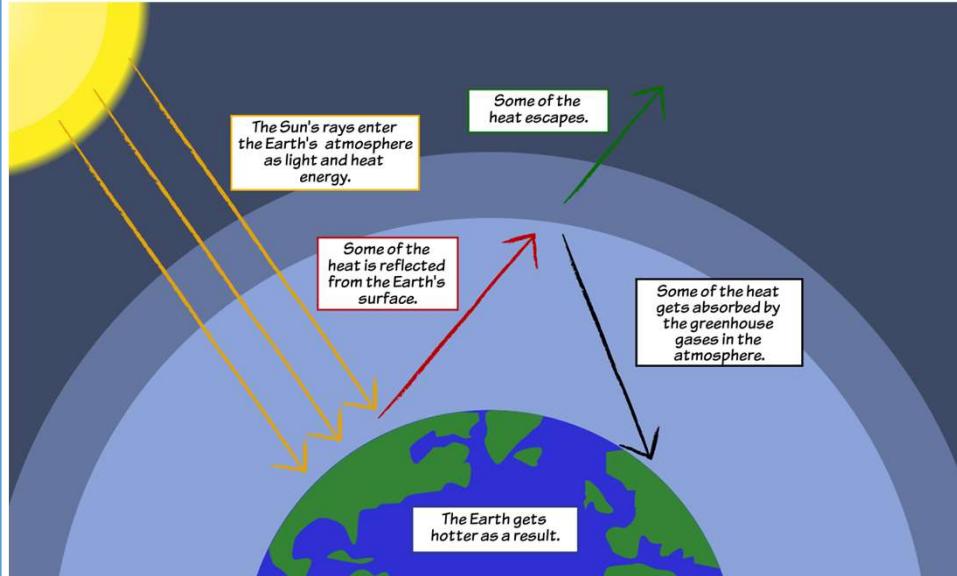
Global pattern of air circulation				
Atmospheric circulation is the large-scale movement of air by which heat is distributed on the surface of the Earth.				
Hadley cell	Largest cell which extends from the Equator to between 30° to 40° north & south.			
Ferrel cell	Middle cell where air flows poleward between 60° & 70° latitude.			
Polar cell	Smallest & weakest cell that occurs from the poles to the Ferrel cell.			
Distribution of Tropical Storms.				
They are known by many names, including hurricanes (North America), cyclones (India) and typhoons (Japan and East Asia). They all occur in a band that lies roughly 5 - 15° either side of the Equator.				
High and Low Pressure				
Low Pressure	High Pressure			
Caused by hot air rising. Causes stormy, cloudy weather.	Caused by cold air sinking. Causes clear and calm weather.			

Formation of Tropical Storms		Primary Effects of Tropical Storms	
<p>1 The sun's rays heat large areas of ocean in the summer and autumn. This causes warm, moist air to rise over the particular spots</p> <p>2 Once the temperature is 27°, the rising warm moist air leads to a low pressure. This eventually turns into a thunderstorm. This causes air to be sucked in from the trade winds.</p> <p>3 With trade winds blowing in the opposite direction and the rotation of earth involved (Coriolis effect), the thunderstorm will eventually start to spin.</p> <p>4 When the storm begins to spin faster than 74mph, a tropical storm (such as a hurricane) is officially born.</p> <p>5 With the tropical storm growing in power, more cool air sinks in the centre of the storm, creating calm, clear condition called the eye of the storm.</p> <p>6 When the tropical storm hits land, it loses its energy source (the warm ocean) and it begins to lose strength. Eventually it will 'blow itself out'.</p>		<ul style="list-style-type: none"> The intense winds of tropical storms can destroy whole communities, buildings and communication networks. As well as their own destructive energy, the winds can generate abnormally high waves called storm surges. Sometimes the most destructive elements of a storm are these subsequent high seas and flooding they cause to coastal areas. 	
Secondary Effects of Tropical Storms		Case Study: UK Heat Wave 2003	
<ul style="list-style-type: none"> People are left homeless, which can cause distress, poverty and ill health due to lack of shelter. Shortage of clean water and lack of proper sanitation makes it easier for diseases to spread. Businesses are damaged or destroyed causing employment. Shortage of food as crops are damaged. 		<p>Causes The heat wave was caused by an anticyclone (areas of high pressure) that stayed in the area for most of August. This blocked any low pressure systems that normally brings cooler and rainier conditions.</p>	
Management		Effect	
<ul style="list-style-type: none"> People suffered from heat strokes and dehydration. 2000 people died from causes linked to heatwave. Rail network disrupted and crop yields were low. 		<p>Effect</p> <ul style="list-style-type: none"> The NHS and media gave guidance to the public. Limitations placed on water use (hose pipe ban). Speed limits imposed on trains and government created 'heatwave plan'. 	
Case Study: Typhoon Haiyan 2013		Management	
<p>Causes Started as a tropical depression on 2nd November 2013 and gained strength. Became a Category 5 "super typhoon" and made landfall on the Pacific islands of the Philippines.</p>		<p>Effects</p> <ul style="list-style-type: none"> Almost 6,500 deaths. 130,000 homes destroyed. Water and sewage systems destroyed had caused diseases. Emotional grief for dead. 	



What is Climate Change?

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



Recent Evidence for climate change.

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

Enhanced Greenhouse Effect

Recently there has been an increase in **humans burning fossil fuels** for energy. These fuels (gas, coal and oil) emit **greenhouse gases**. This is making the Earth's atmosphere thicker, therefore trapping more solar radiation and causing **less to be reflected**. As a result, the Earth is becoming warmer.

Evidence of natural change

Orbital Changes	Some argue that climate change is linked to how the Earth orbits the Sun, and the way it wobbles and tilts as it does it.
Sun Spots	Dark spots on the Sun are called Sun spots. They increase the amount of energy Earth receives from the Sun.
Volcanic Eruptions	Volcanoes release large amounts of dust containing gases . These can block sunlight and results in cooler temperatures.

Managing Climate Change

Carbon Capture This involves new technology designed to reduce climate change.	Planting Trees Planting trees increase the amount of carbon is absorbed from atmosphere.
International Agreements Countries aim to cut emissions by signing international deals and by setting targets.	Renewable Energy Replacing fossil fuels based energy with clean/natural sources of energy.



Year 10 French Term 1

French

at Da Vinci Academy

Quelle est ta personnalité ?	A	What is your personality?
Je dirais que je suis assez drôle et je pense que je suis un peu intelligente aussi.	1	I would say that I am quite funny and I think that I am a bit intelligent also.
Cependant, je me trouve plutôt tête à et il faut que je dise que je ne suis pas très patiente non plus.	2	However, I find myself rather stubborn and I must say that I am not very patient either.
C'est quoi un bon ami, pour toi?	B	What makes a good friend, for you?
Pour moi, un bon ami est compréhensif et il a les mêmes centres d'intérêts que moi.	6	For me, a good friend is understanding and he has the same interests as me.
De plus, il ne me juge jamais et il faut qu'il soit aussi marrant.	7	Moreover, he never judges me and it is essential that he is also funny.
Mon meilleur ami, qui s'appelle Alex, est très gentil et assez sympa tandis qu'il n'est pas toujours sensible et il est parfois pénible.	8	My best friend, who is called Alex, is very kind and quite nice whereas he is not always sensitive and he is sometimes annoying.
Tu t'entends bien avec ta famille ?	C	You get on well with your family?
Dans ma famille, il y a cinq personnes.	14	In my family there are five people.
Je dirais que je rassemble à mon père car on a tous les deux les cheveux bruns et les yeux verts.	15	I would say that I look like my father because we both have brown hair and green eyes.
En général, je m'entends très bien avec mes parents même si on se chamaillait de temps en temps.	16	In general, I get on very well with my parents even though we bicker from time to time.
Ma mère est vraiment travailleuse et je l'admire beaucoup. Quand j'étais plus jeune, j'adorais ma petite sœur, mais maintenant je la trouve vraiment agaçante surtout quand on se dispute tout le temps.	17	My mother is really hardworking and I admire her a lot. When I was younger, I loved my little sister, but now I find her really annoying especially when we argue all the time.
Tu vas faire quoi le week-end prochain ?	D	What are you doing next weekend?
Le week-end prochain je vais aller à un match de foot avec mon copain après avoir mangé au fast-food. Aussi, je vais jouer à des jeux vidéo avec mon frère. Ce sera génial! Je l'attends avec impatience !	23	Next weekend I'm going to go to a football match with my friend after having eaten at a fast food place. Also I'm going to play video games with my brother. It will be great! I'm looking forward to it!
Qu'est-ce que tu as fait le week-end dernier ?	E	What is it you have done the weekend last?
Le weekend dernier je suis sortie avec mes amis	27	Last weekend I went out with my friends.
D'abord on a visité le musée où il y avait une expo cool.	28	Firstly we visited the museum where there was a cool exhibit.
Puis on est allés au centre commercial où j'ai acheté un nouveau t-shirt.	29	then we went to the shopping centre where I've bought a new t-shirt.
C'était une super journée, même s'il faisait froid.	30	It was a great day, even if it was cold.



Sentence builder 1 – Describing relationships

<p>Pour moi, un bon ami est (For me, a good friend is...)</p> <p>À mon avis, un bon ami n'est pas (In my opinion a good friend isn't)</p> <p>Je pense qu'un bon ami doit être (I think that a good friend must be...)</p> <p>Je dirais qu'un bon ami est (I would say that a good friend is...)</p> <p>Il faut qu'on bon ami soit (A good friend needs to be...)</p> <p>Je voudrais me marier avec quelqu'un qui est (I want to marry someone who is...)</p>	<p>très very</p> <p>assez quite</p> <p>plutôt rather</p> <p>un peu a bit</p> <p>toujours always</p> <p>trop too</p>	<p>agaçante annoying</p> <p>arrogante arrogant</p> <p>bavardes chatty</p> <p>casse-pieds annoying</p> <p>compréhensif/ive understanding</p> <p>drôle funny</p> <p>égoïste selfish</p> <p>fidèle loyal</p> <p>généreux/se generous</p> <p>gentille kind</p> <p>honnête honest</p> <p>jaloux/se jealous</p> <p>marrante funny</p> <p>méchante mean</p> <p>optimiste optimistic</p> <p>parasseux/ses lazy</p> <p>pessimiste pessimistic</p> <p>pénible annoying</p> <p>(im)patiente (in)patient</p> <p>rigolote funny</p> <p>sensible sensitive</p> <p>stricte/sévère strict</p> <p>sympa nice</p> <p>têtue stubborn</p> <p>travailleur/se hardworking</p>	<p>et (and)</p> <p>mais (but)</p>	<p>il/elle... (he/she...)</p> <p>a le sens de l'humour. has a sense of humour.</p> <p>a les mêmes centres d'intérêt que moi. has the same interests as me.</p> <p>accepte mes imperfections. accepts my imperfections.</p> <p>aide tout le monde. helps everyone.</p> <p>croit en moi. believes in me.</p> <p>discute de tout avec moi. discusses everything with me.</p> <p>dit toujours la vérité. always tells the truth.</p> <p>écoute mes problèmes et mes secrets. listens to my problems and secrets.</p> <p>me fait rire. makes me laugh.</p> <p>ne me juge jamais. never judges me.</p> <p>prend soin de moi. takes care of me.</p> <p>respecte mes opinions. respects my opinions.</p> <p>voit le bon côté de choses. sees the positive side of things.</p>
<p>Je m'entends bien avec I get on well with</p> <p>Je m'amuse avec I have fun with</p> <p>Je me confie à I trust / confide in</p> <p>Je me chamailler avec I bicker with</p> <p>Je me dispute avec I argue with</p> <p>Je me fâche contre I get angry with</p>	<p>mon père my father</p> <p>mon frère my brother</p> <p>mon oncle my uncle</p> <p>mon grand-père my grandfather</p> <p>mon beau-père my step-father</p> <p>mon demi-frère my step/half brother</p> <p>mon meilleur ami my best friend (m)</p> <p>ma mère my mother</p> <p>ma sœur my sister</p> <p>ma tante my aunt</p> <p>ma grand-mère my grandmother</p> <p>ma belle mère my step-mother</p> <p>ma demi-sœur my step/half sister</p> <p>ma meilleure amie my best friend (f)</p>	<p>parce qu'il est because he is</p> <p>bien qu'il soit although he is</p> <p>parce qu'elle est because she is</p> <p>bien qu'elle soit although she is</p>		



Sentence builder 2 – Using the near future tense to say what you are going to do (*le futur proche*)

FUTURE TIME PHRASE	SUBJECT + ALLER (to go)	INFINITIVE ACTIVITY	VERB	INTENSIFIER	ADJECTIVE
Après-demain the day after tomorrow	je vais I am going	acheter des vêtements. to buy clothes. aller au cinéma/au parc/à la piscine. to the cinema/park/swimming pool. boire du champagne/coca. to drink champagne/coke. danser à la boîte/fête. to dance at the club/party. écouter de la musique. to listen to music. faire les magasins/du sport/les devoirs. to do shopping/sport/homework. jouer au foot/au rugby/à des jeux vidéo. to play football/rugby/video games. lire un livre/un journal. to read a book/a newspaper. manger au restaurant/au fast-food. to eat at the restaurant/fast-food place. regarder un film/la télé. to watch a film/the tv. rentrer à la maison. to go back home. rester à la maison. to stay at home. retrouver des amis en ville. to meet some friends in town. traîner en ville. to hang out in town. sortir avec des amis. to go out with friends. visiter le musée/le château. to visit the museum/the castle.	Ce sera it will be	assez quite	amusant fun
Demain tomorrow	tu vas you are going			très very	barbant tedious
L'année prochaine next year	il/elle/on va he/she/we are going			plutôt rather	ennuyeux boring
L'été prochain next summer	nous allons we are going			un peu a bit	formidable terrific
La semaine prochaine next week	vous allez you (pl) are going			vraiment really	génial great
Le week-end prochain next weekend	ils/elles vont they (m/f) are going				nul rubbish
Bientôt soon					relaxant relaxing

N.B. To extend your sentences, link several events using SEQUENCERS:

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



Sentence builder 3 – Using the perfect tense to say what you did in the past (*le passé composé*)

PAST TIME PHRASE	SUBJECT + AUXILIARY VERB (mostly ' avoir ', sometimes ' être ')	PAST PARTICIPLE + ACTIVITY	VERB	INTENSIFIER	ADJECTIVE
Avant-hier the day before y'day	AVOIR (to have) j'ai (I) tu as (you) il/elle/on a (he/she/we) nous avons (we) vous avez (you pl.) ils/elles ont (they m/f)	acheté des vêtements. bought clothes. bu du champagne/coca. drank champagne/coke. dansé à la boîte/fête. danced at the club/party. écouté de la musique. listened to music. fait les magasins/du sport/les devoirs. did shopping/sport/homework. joué au foot/au rugby. played football/rugby. lu un livre/un journal. read a book/a newspaper. mangé au restaurant/fast-food. ate at a restaurant/fast-food place. regardé un film/la télé. watched a film/tv. retrouvé des amis en ville. met some friends in town. traînё en ville. hung out in town. visité le musée/le château. visited the museum/castle.	C'était it was	assez quite très very plutôt rather un peu a bit vraiment really	amusant fun barbant tedious ennuyeux boring formidable terrific génial great nul rubbish relaxant relaxing
Hier yesterday					
L'année dernière last year					
L'été dernier last summer					
La semaine dernière last week					
Le week-end dernier last weekend	ÊTRE (to be) je suis (I) tu es (you) il/elle/on est (he/she/we) nous sommes (we) vous êtes (you pl.) ils/elles sont (they m/f)	allé(e)(s) au cinéma/au parc/à la piscine. went to the cinema/park/swimming pool. sorti(e)(s) avec des amis. went out with some friends. rentré(e)(s) à la maison. went back home. resté(e)(s) à la maison. stayed at home.			
Récemment recently					
		*NB with these few verbs that take ' être ' as the auxiliary verb, you need an extra 'e' ending on the past participle if your subject is feminine & an 's' if plural ('es' if both feminine & plural).			

N.B. To extend your sentences, link several events using SEQUENCERS:

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



Art

at Da Vinci Academy

Grades of pencil

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

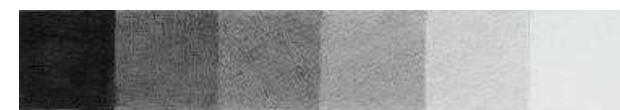
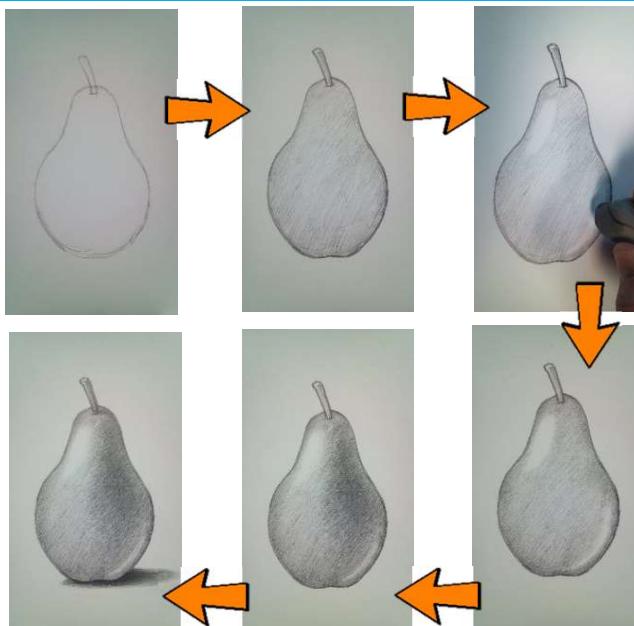
H=Hard B=Black

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



When **applying tone** to a drawing you must remember to apply base shades first to add depth and suggest form.

Secondly, add mark making to develop the texture and fine details line work to finish.

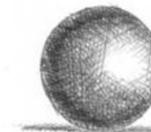


Tonal shade

Produce a range of tones by varying the pressure and layering - consider using softer pencils for darker shades

Mark Making - techniques

Directional shading is shading that follows the contours of an object. Using this method makes your work appear more realistic. Look at the portrait, see how the shading changes direction and curves with the shape of the figure. This technique should be used on all drawings. See how it has been used on the spheres below.



Cross hatching



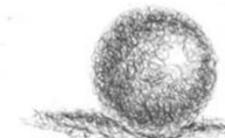
Hatching



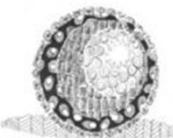
Contour lines



Stippling



Scribble

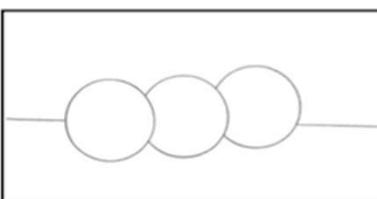


Patterns

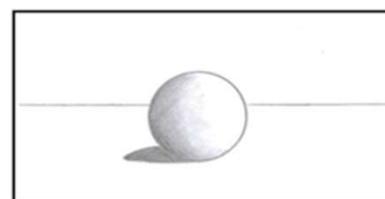


Composition

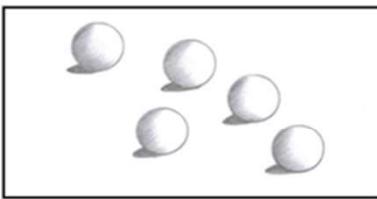
Creating a sense of **space and depth** is important in art work to make it feel sophisticated and well thought out. Knowing how to raise objects over the top of each other is important in communicating space and depth to your viewer.



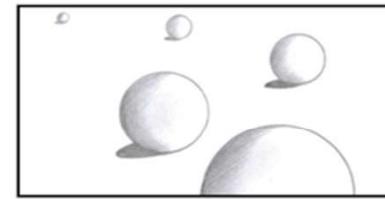
Overlap
One object appears to be behind the other



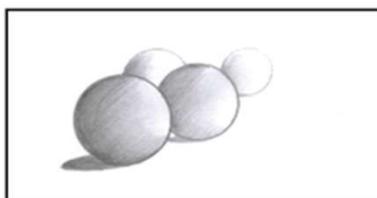
Shading
Light and shadow create the illusion of form and space



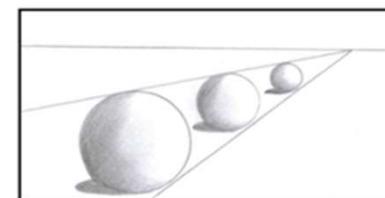
Placement
Objects higher in the picture appear to be in the distance



Size
Small objects look distant, while closer objects should be larger

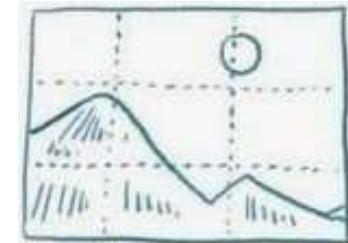


Value and Focus
Lighter values and less details suggest distant objects



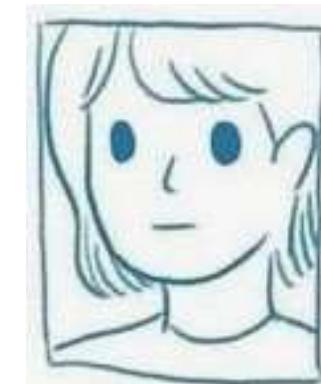
Linear Perspective
Parallel lines and edges seem to go toward one or more vanishing points

Rule of thirds – Place focal elements (objects) at 1/3 or 2/3 of the image horizontally or vertically, not in the middle

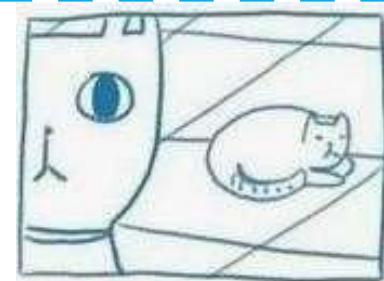


Repetition and grouping
Try grouping objects in odd numbers, this often looks better than an even number of objects.

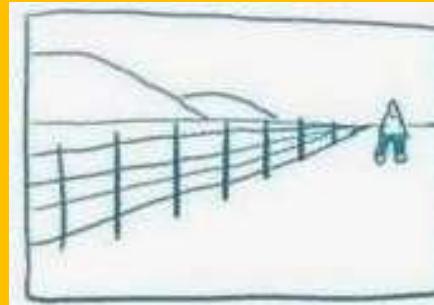
Simplify and fill – Enlarge or crop the image to fill the space and draw your viewers attention to that particular object



Balance elements – If there is an emphasis on one side of the piece balance it out with smaller objects on the other side.

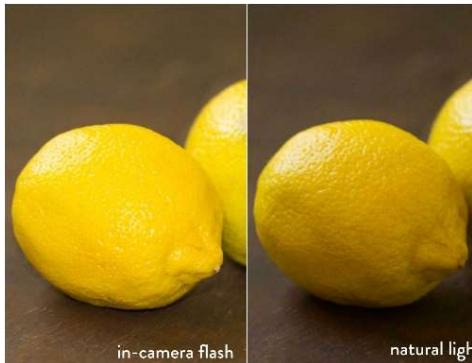


Line – Use lines to draw the viewers eye across the work. The lines don't have to be straight, think about using S or C shaped lines.



**Light**

Use natural light as much as possible. The best times for shooting are sunrise and sunset. As far as possible avoid taking shots in artificial light i.e. bedroom lights or with flash.



Notice that most of the tone is removed with flash on

**Noise**

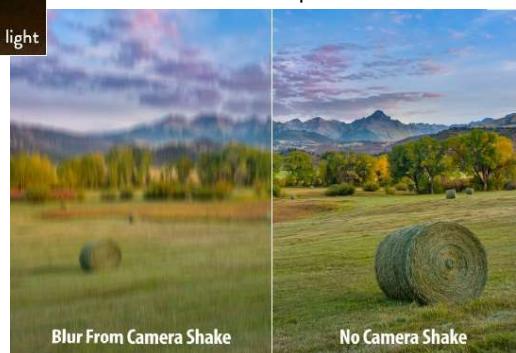
Avoid digital zoom, it can make images grainy, this is called noise in photography. Try to get physically closer to your subject instead (if you can).

Pro tip: Take lots of pictures from similar angles and only make slight changes with each photograph. Once you have finished capturing you can choose which images are the best.

Taking a Good Photograph

Taking a good photograph will be key to your project. You will be using these images to draw from. Photography is another great way to record (AO3) the work you are carrying out.

If your picture is blurry, it means you are probably too close to your subject. Move back a little bit until your image becomes sharper.

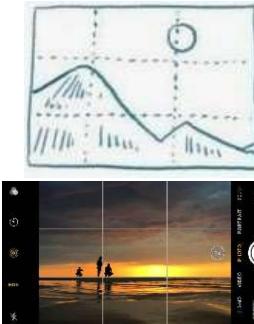


When there is less light your camera finds it harder to focus and often it will create an image with 'camera shake'. If you need to take an image in low light try to rest your camera on a flat surface to help steady it.

Think – don't just point your camera and click. Think about what you want to take a picture of, is it...

- Texture? Get in really close, just make sure your picture is focused and not blurry.
- A portrait? Make sure nothing distracts from your main subject, try to use a plain background,
- Landscape? Then hold your camera steady, stand far back and line up your scene with the rule of thirds.

Grid lines – on most phones/cameras you can go into the settings and add grid lines. Using these grid lines will help you to create a successful composition and therefore photograph. Check out the 'Composition' page and look at the 'rule of thirds'.



To switch the grid on ...

iPhone: Go to "Settings," choose "Photos & Camera," and switch "Grid" on.

Samsung Galaxy: Launch the camera app, go to "Settings," scroll down and switch the "grid lines" option to "on."



Art

at Da Vinci Academy

Tape Masking

- Tape off sections of your paper with masking tape.
- Paint over the tape and let dry.
- Peel tape off and reveal white paper underneath.



Blot

- Use a paper towel to blot up wet paint to reveal white paper underneath.



Salt

- Sprinkle salt into a wet (still shiny) wash of watercolor paint.
- The results will appear when dry.



Consider using some of the watercolour techniques mentioned here to give your work texture and visual interest.

Painting with watercolour – Tips

- If water is pooling at all on the paper, you generally have too much water, it will be harder to control the flow of the paint.
- Use two jars of water, one for cleaning your brushes and one with clean water to mix paints.
- Use thicker 'watercolour paper' normal paper will become wavy as it cannot handle so much water.
- Tape down your paper before, during and after painting until your image is completely dry, this way you will have nice flat paintings.
- Let your watercolour dry between layers,
- Use a layering technique, just remember that you cannot put lighter colours over darker colours when using watercolour, work from light to dark.

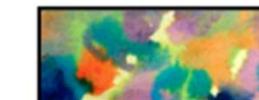
Crayon Resist

- Draw with any color of crayon on dry paper.
- Paint wet watercolor over crayon to reveal drawing underneath.



Wet-in-Wet

- Apply clean water to your paper.
- Before the water dries, load up your brush with paint and touch it to the water. The color will spread quickly.



Painting

Dry Brush

- Start with a dry brush and almost dry paint.
- Run your brush over your paper to create grass or scratchy lines.



Wash

- Load your brush with plenty of wet paint. Smooth your brush over the paper with swooping strokes.



Painting in layers

Painting, just like drawing (or making a sandwich) needs to be done in layers.

You must start from the base of your image and work forwards. Think about background, midground and foreground

- We can add different materials or techniques individually one over the other,
- waiting until one layer is dry before applying the next.
- Each layer could be the same technique as before, or a different one.
- A layer doesn't have to cover the surface in its entirety.

A **layer** can consist merely of one small dab of paint, or can involve thick overlays covering the whole surface. A technique does not have to be applied over the whole surface to qualify as a layer.

Painting with acrylic - In stages

Once you have finished drawing out what you want to paint you should follow these rules when painting with acrylic

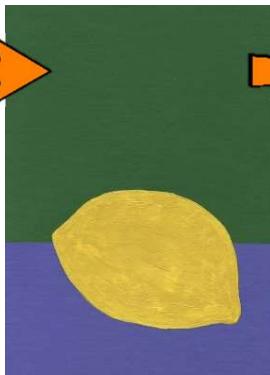
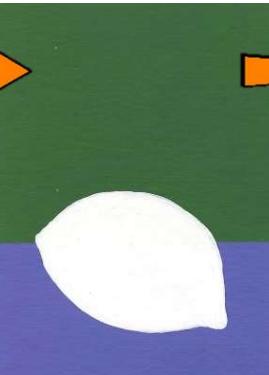
Paint a background

White under brights

Brights over white(block colour)

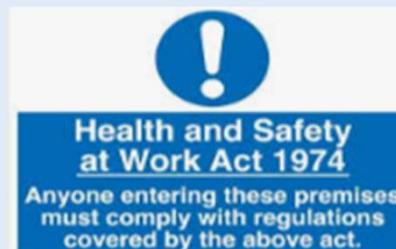
Apply tonal range, shadows/highlights

Brights: a colour that is lighter than your background





Legislation



The Act places a general duty to 'ensure so far as is reasonably practicable the health, safety and welfare at work of all their employees'.

Employers must comply with the Act. Examples include: provide and maintain **safety equipment** and safe systems of work, provide **training**, provide a **risk assessment**. **Employees** have specific responsibilities too - they must: take care of their own **health and safety** and **that of other persons** (employees may be liable), follow the **rules** of the company.

Provision and Use of Work Equipment Regulations 1998

The regulations deals with the work equipment and machinery used every day in workplaces and **aims to keep people safe wherever equipment and machinery is used** at work, the regulations aim to ensure that all equipment is: **suitable** for its intended purpose, **regularly maintained** to ensure safety, only used by people who have received adequate **training** inspected by a **competent** worker.

Working At Height



Working at Heights regulation 2005

They include all work activities where there is a need to **control a risk of falling** a distance liable to cause **personal injury**.

This is regardless of the work equipment being used, the duration the person is at a height, or the height at which the work is performed.



Manual Handling Regulations 1992

The Regulations define manual handling as: "...any transporting or supporting of a load (including the **lifting, putting down, pushing, pulling, carrying or moving thereof**) by hand or bodily force". The load can be an object, person or animal.

The MHOR 1992 clear **measures for dealing with risks from manual handling**, these are:

first: avoid hazardous manual handling operations so far as is reasonably practicable;

second : assess any hazardous manual handling operations that cannot be avoided; and

third: reduce the risk of injury so far as is reasonably practicable e.g. use of wheelbarrow, sharing load.

Max load: 25kg

Personal Protective Equipment Regulations 2002 (PPE)

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

PPE is equipment that will **protect the user against health or safety risks at work**. It can include items such as safety helmets and hard hats, gloves, eye protection, high-visibility clothing, safety footwear and safety harnesses.

The Regulations also require that PPE is:

- properly assessed** before use to make sure it is fit for purpose;
- maintained and stored properly**;
- provided with **instructions** on how to use it safely;
- used **correctly** by employees.

Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR)

is the law that requires employers, and other people in charge of work premises, **to report and keep records of**:

- work-related accidents which cause **deaths**.
- work-related accidents which cause **certain serious injuries** (reportable injuries)
- diagnosed cases of **certain industrial diseases**;
- certain '**dangerous occurrences**' (incidents with the potential to cause harm)



Now wash your hands please



High visibility clothing must be worn in this area



Protective gloves must be worn



Eye protection must be worn in this area

Risks—

Key terms:

Likely—The more likely something is, the higher the chance there is of it happening

Severity—The more severe something is, the more high risk it is

High/medium/Low

Control measures

Control measures include actions that can be taken to **reduce** the potential of exposure to the hazard, or the control measure could be to **remove** the hazard or to reduce the likelihood of the risk of the exposure to that hazard being realised.

Could include: Method statements , Safe systems of work , Work permits , Competent persons , PPE

The Control of Substances Hazardous to Health Regulations 2002 (COSHH) is the law that requires employers to control substances that are hazardous to health. You can prevent or reduce workers exposure to hazardous substances by:

- deciding how to **prevent harm** to health (risk assessment);
- providing **control measures** to reduce harm to health;
- **making sure they are used** ;
- keeping all control measures in **good working order**;
- providing **information, instruction and training** for employees and others; COSHH cupboard/locked/correct PPE

KNOW YOUR FIRE EXTINGUISHERS - Types and Applications



Know your Fire Extinguisher

Symbols found on fire extinguishers and what they mean		WATER	FOAM SPRAY	ABC POWDER	CARBON DIOXIDE	WET CHEMICAL
Wood, paper & textiles	A	✓	✓	✓	X	✓
Flammable Liquids	B	X	✓	✓	✓	X
Flammable Gases	C	X	X	✓	X	X
Electrical Contact	F	X	X	✓	✓	X
Cooking oils & fats	E	X	X	X	X	✓



The Health and Safety Executive (HSE) is Britain's national regulator for workplace health and safety. It **prevents work-related death, injury and ill health**. We achieve this using a variety of methods to influence change and **help people manage risks at work**. These include:

- providing **advice, information and guidance**
- raising awareness in workplaces by influencing and engaging
- operating permissioning and licensing activities in major hazard industries
- carrying out **targeted inspections** and investigations
- taking **enforcement** action to prevent harm and hold those who break the law to account

We take enforcement action if there is harm / potential harm:

- deal immediately with **serious risks** (so they prevent harm) - e.g. **shut down site**, ensure control measures are put into place
- comply with the law
- are **held to account** if they fail in their responsibilities e.g can give fines / **prosecute** businesses

Colour	Meaning or purpose	Instruction and information
Red	Prohibition sign Danger alarm	Dangerous behaviour; stop; shutdown; emergency cut-out devices; evacuate
Yellow Amber	Warning sign	Be careful; take precautions; examine
Blue	Mandatory sign	Specific behaviour or action, eg wear protective equipment
Green	Emergency escape First-aid sign No danger	Doors; exits; escape routes; equipment and facilities Return to normal

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

Prohibitory signs



Warning signs



Mandatory signs



Emergency escape or first-aid signs





CARBO-HYDRATES



Simple Carbohydrates = Sugars
Fast release Carbohydrates such as Fruit, Energy drinks, Sweets, honey.

Simple Sugars (Monosaccharides)



Disaccharides – 2 sugar molecules



Maltose Lactose Sucrose

Keyword	Meaning
Monosaccharides	A simple sugar: the most basic sugar molecule.
Disaccharides	Made up of two monosaccharides.
Polysaccharides	Complex carbohydrates: made up of lots of monosaccharides joined together.

Complex Carbohydrates= Starch
Slow release carbohydrates such as Potatoes, Pasta, Rice.



Complex Carbohydrates
Polysaccharides – long chain sugar molecules



All carbohydrates, no matter what type, provide 4kcal of energy per gram. The difference is complex carbs take longer to break down and therefore satisfy hunger for longer, whereas simple sugars leave you feeling empty and wanting more. **Complex carbs provide dietary bulk and fibre which makes us feel full!**

Deficiency

Low carbohydrate diets may cause blood sugar (glucose) to drop, resulting in feeling hungry, weak and dizzy.

Excess

If more energy is consumed than burnt off, the excess glucose is stored in the liver and muscles as energy. Over time, this leads to weight gain and obesity. Obesity puts the body at higher risk of heart disease and type 2 diabetes.

Energy Balance

Energy from food is measured in calories (kcal).

Carbohydrates = 4kcal per gram

Too much energy from food and drink is stored as **fat** in the body.

The amount of food and therefore calories is different from person to person based on; age, gender and physical activity levels



RDA - It is recommended that 1/3 of the diet should come from starchy foods. 1g carbohydrate = 16kJ/3.75 kcal

Ranks carbohydrate foods based on blood glucose levels: Foods absorbed slowly have a low GI rating.
Foods absorbed quickly have a high GI rating.

Glycaemic Index – GI

Low GI Foods – 55 or less

most fruits
non-starchy vegetables
carrots
100% stone ground
whole wheat bread
legumes

Medium GI Foods - 56 - 69

brown rice
basmati rice
oats

High GI Foods – 70 or more

white bread
corn flakes
white rice
white pasta
pineapple
melon



PROTEIN

Proteins are made up of amino acids of which there are:

9 essential

12 non-essential

Body cannot manufacture (make) these.

Can be made by the body.

Must be provided by our diet.

Low Biological Value

High Biological Value

Animal sources of protein, such as meat, poultry, fish, eggs, milk, cheese and yogurt.

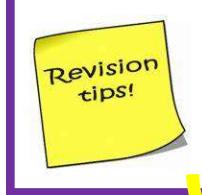
Combining two or more LBV protein foods can provide the essential amino acids found in a meat dish:

- baked beans on wholemeal toast
- dhal with rice
- hummus and pitta bread

Deficiency

Symptoms of protein deficiency include:

- wasting and shrinking of muscle tissue;
- oedema: build up of fluids (especially in feet and ankles);
- anaemia: blood cannot deliver enough oxygen to the cells often caused by a lack of iron;
- slow growth in children.



Revision Tip

Proteins are needed for repair, growth and maintenance.
Use a mnemonic like 'Really Good Macronutrient' (RGM)

Protein
(4kcal per gram)



Kwashiorkor



Excess

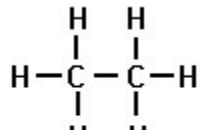
Too much protein can put pressure on the liver and kidneys (the organs which help process the protein).

Keyword	Meaning
Amino Acid	Proteins are made up of Amino acids- these can be thought of as the building blocks of the body
High Biological Value	HBV Proteins contain all of the essential amino acids we need
Low Biological Value	LBV proteins are missing one or more of the essential amino acids we need.
Protein Complementation	If we don't get enough HBV protein we can combine different LBV proteins to get all of the essential amino acids in our diet

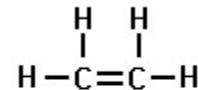
Protein Alternatives	
Soya	<ul style="list-style-type: none"> • plant-based HBV source • used to make soya milk • processed to make tofu and TVP
TVP	<ul style="list-style-type: none"> • textured vegetable protein • made from soya beans • soya flour makes a dough • when baked has a meat-like texture • can be made into sausages, burgers and ready meals
Mycoprotein	<ul style="list-style-type: none"> • Quorn • made from a mushroom like fungus and egg white • vegan alternatives use potato starch • can be turned into mince, chunks and fillets
Tofu	<ul style="list-style-type: none"> • made by curdling soya milk • soft texture used for dips and desserts • firmer texture used in stir fries



FATS



Saturated

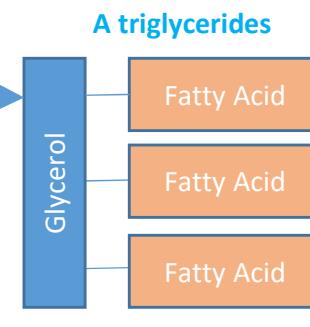


Unsaturated



Fats are made up of **Fatty acids** and **glycerol** in the form of **triglycerides**.

Fatty acid chains are made of **carbon** and **hydrogen**. They can be **saturated** or **unsaturated**- the difference is in how **carbon atoms** bond with **hydrogen atoms**.



RDA – Fat should make up less than 35% of our daily food energy. No more than 11% should be from Saturated fats. It is recommended that an average adult consume 70g of fat.

Deficiency

Fat-soluble vitamins cannot be processed in the body, leading to health issues revolving around lack of vitamins (A, D, E, K).

Less fat means less insulation to keep the body warm and a thinner protective layer under the skin to protect the body from knocks and falls.

Lack of carbohydrate means the body uses the fat as an energy store, which can result in weight loss.

Excess

An excess of fat in the diet can cause weight gain. Over time, this can lead to obesity, which in turn puts the body at risk of diabetes, heart disease, strokes and some cancers.

Fats (9kcal per gram)

RDA – Dietary fibre

Children aged 2-5 = 15g
Children aged 6-11 = 20g
Children ages 11-16 = 30g
Adults = 30g



Fats	
Keyword	Meaning
Saturated	considered the unhealthiest if eaten in large amounts- often from animal sources
Unsaturated	healthier fats, usually liquid at room temperature, help promote healthy cholesterol
Visible fats	Those you can see, such as butter and lard.
Invisible fats	Fats hidden within products, such as milk, cheese and other dairy items.
Monounsaturated	Monounsaturated fats contain one C=C double bond in their carbon chains
Polyunsaturated	Polyunsaturated fats contain more than one C=C double bond in their carbon chains
Omega 3 + Omega 6	are polyunsaturated fats and are classed as 'good' and 'essential' as they cannot be produced by our bodies.
Cholesterol	is a waxy substance which circulates in the blood. It is used by the blood to carry lipoproteins, which take the cholesterol between cells. The body needs a balance of good and bad cholesterol.
Low Density Lipoproteins (LDL)	are often called 'bad cholesterol'. High levels build up in the arteries, meaning a higher risk of heart disease.
High Density Lipoproteins (HDL)	are often called 'good cholesterol'. They carry cholesterol from around the body to the liver, which processes cholesterol out of the body.



Fat Soluble	Needed For	Found In	Deficiency
A Antioxidant	Vision	Dairy Products Dark Green Veg Orange coloured fruit and veg Fish Oils and Liver	Poor vision
D	Bone growth	Fish Oils Dairy Products Sun Light Absorption	Rickets Osteomalacia
E Antioxidant	Protect tissue	Dairy Products Dark Green veg Nuts	Age quickly Wrinkles Skin loses elasticity
K	Blood clotting	Dark Green Veg Fish, liver, fruit	Haemorrhages

Water Soluble	Needed For	Found In	Deficiency
C Antioxidant	Normal structure and function of connective tissue Antioxidant (protects from free radicals) Helps absorb iron	Main sources from plants – fruits and vegetables. Milk and liver contain small amounts.	Scurvy
B1 Thiamin	Normal function of the nervous system and heart	Whole grains, meat, flour and breakfast cereals.	Beri-beri (disorder of the nervous system).
B2 Riboflavin	Release of energy from food	Milk, eggs, green vegetables.	Dry cracked skin around the mouth and nose.
B12	Cell division and blood formation Normal structure of nerves	Animal sources – milk, meat and eggs. Some algae and bacteria can produce B12.	Anaemia (rare), may be found in vegetarians.

Iron

Iron is important in making red blood cells, which carry oxygen around the body.

A lack of iron can lead to iron deficient anaemia.

Women who lose a lot of blood during their monthly period are at higher risk of iron deficiency anaemia and may need to take iron supplements.



Sodium

Salt is also called sodium chloride.

Too much salt can raise your blood pressure, which puts you at increased risk of health problems such as heart disease and stroke.

Sometimes, food labels only give the figure for sodium. There is a simple way to work out how much salt you are eating from the sodium figure:
 $\text{Salt} = \text{sodium} \times 2.5$

Adults should eat no more than 2.4g of sodium per day, as this is equal to 6g of salt.

Calcium

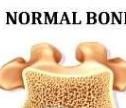
Calcium has several important functions.

These include:

- helping build strong bones and teeth
- regulating muscle contractions, including heartbeat
- making sure blood clots normally

A lack of calcium could lead to a condition called rickets in children and osteomalacia or osteoporosis in later life.

Taking high doses of calcium (more than 1,500mg a day) could lead to stomach pain and diarrhea.



NORMAL BONE



OSTEOPOROSIS





Travel and Tourism

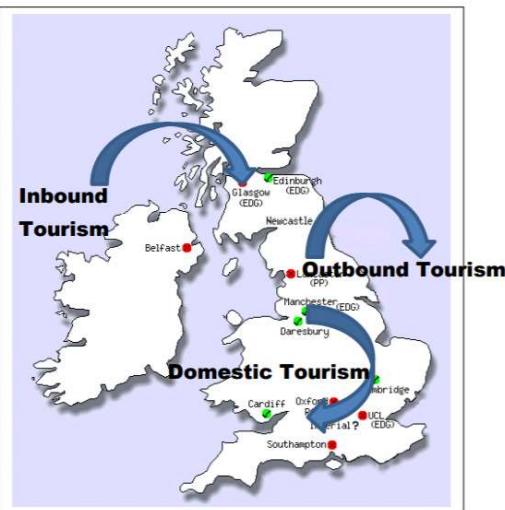
Unit 1

Knowledge Organiser

Key Facts

What are the different types of tourism?

Types of Tourism



Why do people travel? LEISURE TRAVEL

Leisure travel: Travelling to relax and enjoy yourself, outside of work hours.

- Day trips, visiting an attraction and returning home in one day.
- Short breaks, less than 4 nights away from home.
- Holidays, a period of rest and pleasure away from work, usually 1 week but could be longer, usually during school holidays.
- Visiting Friends and Relatives (VFR), travel to get together with friends and family.
- Staycations, a holiday spent at home or in your hometown doing activities or going on trips that there isn't normally time for because of work.
- Special Events, a one-off or repeated event that people travel to specifically attend; such as concerts, festivals, football matches.

Why do people travel? BUSINESS TRAVEL



Why do people travel? SPECIALIST TRAVEL

- Adventure tourism
- Cultural/heritage
- Health tourism
- Education
- Volunteer Tourism
- Dark tourism
- Eco-tourism
- Conservation

What is SUSTAINABLE TOURISM?

- Meeting the needs of the present population whilst protecting natural, historic and cultural resources for the future.
- Environmental factors:
 - Make best use of natural resources
 - Protect the environment
 - Protect wildlife
- Social/cultural factors:
 - Be good for the country and local people
 - Improve local quality of life
 - Protect traditions/traditional way of life
- Economic factors:
 - Make money for local people
 - Make jobs for local people
 - Improve life for the poor

What are the benefits of sustainable tourism?

- It helps to protect the environment
- It reduces the amount of energy used, e.g. electricity, petrol
- It reduces the amount of waste created
- It creates links with the local community
- It makes businesses more competitive
- It improves the image of businesses
- It saves business money



Travel & Tourism

Travel and Tourism

Unit 1

Knowledge Organiser

Key Facts

How important is tourism to the UK economy? EMPLOYMENT	How important is tourism to the UK economy? GDP	What is the TOURISM MULTIPLIER EFFECT?								
<ul style="list-style-type: none"> Direct employment <ul style="list-style-type: none"> Jobs that are created by the travel and tourism industry, for example airline cabin crew, train driver, travel agent Indirect employment <ul style="list-style-type: none"> Jobs that are created to SUPPLY and SUPPORT the travel and tourism industry, for example the baker who supplied pastries to the hotel, the mechanic who fixes coaches used by the tour operator etc. 	<ul style="list-style-type: none"> GDP stands for Gross Domestic Product It is the total value of goods and services bought and sold over a set period – usually a year. Tourism is worth around £250bn in a normal year It is very important to our GDP 	<ul style="list-style-type: none"> This is where tourism has an impact not just on the place the tourist is visiting, but upon other people/places nearby. Eg: <ul style="list-style-type: none"> A new hotel opens up They pay a local laundrette to clean their sheets The new launderette employs a new member of staff for this job That member of staff spends more money in local stores Local store owners benefit through increased income 								
What is a TOUR OPERATOR?	What is a TRAVEL AGENT?	What are the advantages and disadvantages of using online travel services?								
<ul style="list-style-type: none"> A company which takes the separate elements of a holiday, and packages them together to be sold to a customer. A tour operator may typically sell you a package which includes: <ul style="list-style-type: none"> A flight to your destination Transfers between the holiday airport and the holiday accommodation Holiday accommodation and services Tour operators can be DOMESTIC (UK holiday), OUTBOUND (holidays abroad for UK tourists), and INBOUND (holidays in the UK for foreign tourists) 	<ul style="list-style-type: none"> The travel agent is the place from where the tour operator's package can be purchased, or, you can buy the different elements and other elements of the holiday from them. For example, you could buy the package holiday mentioned previously from the Travel Agent, who may then also sell you: <ul style="list-style-type: none"> Travel insurance Foreign currency UK airport parking Car hire whilst abroad Attraction tickets There may be MULTIPLES (lots of branches, e.g. Hayes Travel), INDEPENDENTS (one-off independent retailers) or ONLINE (web presence only, e.g. Expedia) 	<table border="1"> <thead> <tr> <th>Advantages of Online Travel Services</th><th>Disadvantages of Online Travel Services</th></tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> Easy for the customer to book their holiday when they want 24/7 availability Customers can compare products and costs of services of lots of holiday providers. Easy to make up the holiday that matches your own needs. You find out instantly what is available, making it easy to get last minute deals. Offers of Blogs for further information </td><td> <ul style="list-style-type: none"> No expert help, no one to talk to for advice. Limited choice of itinerary. Lack of security online can lead to credit card theft or identity theft. Customer has to sort out their own problems if something goes wrong. It is easy to miss things when you book yourself e.g. transport to and from the airport, insurance etc. Difficult for group bookings </td></tr> </tbody> </table>	Advantages of Online Travel Services	Disadvantages of Online Travel Services	<ul style="list-style-type: none"> Easy for the customer to book their holiday when they want 24/7 availability Customers can compare products and costs of services of lots of holiday providers. Easy to make up the holiday that matches your own needs. You find out instantly what is available, making it easy to get last minute deals. Offers of Blogs for further information 	<ul style="list-style-type: none"> No expert help, no one to talk to for advice. Limited choice of itinerary. Lack of security online can lead to credit card theft or identity theft. Customer has to sort out their own problems if something goes wrong. It is easy to miss things when you book yourself e.g. transport to and from the airport, insurance etc. Difficult for group bookings 				
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What is road travel?	How popular is rail travel in the UK?	Is air travel all the same?								
<ul style="list-style-type: none"> Most domestic travel takes place by road, usually by car or by coach <table border="1"> <thead> <tr> <th>Advantage of Road Travel</th><th>Disadvantages of Road Travel</th></tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> Cars can stop whenever they want They can take more luggage There are not many toll roads (ones you have to pay to travel on) in the UK You can listen to your own music-as loud as you want! These days navigation is easy if you have a sat nav device. </td><td> <ul style="list-style-type: none"> Fuel is expensive There is a lot of traffic which slows you down It is hard for inbound tourists who have to get used to driving on the opposite side of the road. You have to concentrate to avoid accidents, (there are more road accidents than other forms of travel), this is tiring for the driver. </td></tr> </tbody> </table>	Advantage of Road Travel	Disadvantages of Road Travel	<ul style="list-style-type: none"> Cars can stop whenever they want They can take more luggage There are not many toll roads (ones you have to pay to travel on) in the UK You can listen to your own music-as loud as you want! These days navigation is easy if you have a sat nav device. 	<ul style="list-style-type: none"> Fuel is expensive There is a lot of traffic which slows you down It is hard for inbound tourists who have to get used to driving on the opposite side of the road. You have to concentrate to avoid accidents, (there are more road accidents than other forms of travel), this is tiring for the driver. 	<ul style="list-style-type: none"> Rail travel tends to be very popular in the UK for both local and long distance journeys. Our stations tend to be centrally located and the network is comprehensive <table border="1"> <thead> <tr> <th>Advantages of Rail Travel</th><th>Disadvantages Of Rail Travel</th></tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> Very comfortable (especially first class) You can get almost everywhere by rail. You can sleep, read and work while travelling. There is a very good safety record You can buy food and drink, there is a toilet and some have a restaurant. Most now have charging facilities and WiFi; </td><td> <ul style="list-style-type: none"> It is expensive Prices can be very confusing Changes can be difficult for foreign travellers. Sometimes you have to change train a few times to get to where you want to go, this can be difficult with a lot of luggage or children. Can be very busy and noisy. Trains can be cancelled and delayed. </td></tr> </tbody> </table>	Advantages of Rail Travel	Disadvantages Of Rail Travel	<ul style="list-style-type: none"> Very comfortable (especially first class) You can get almost everywhere by rail. You can sleep, read and work while travelling. There is a very good safety record You can buy food and drink, there is a toilet and some have a restaurant. Most now have charging facilities and WiFi; 	<ul style="list-style-type: none"> It is expensive Prices can be very confusing Changes can be difficult for foreign travellers. Sometimes you have to change train a few times to get to where you want to go, this can be difficult with a lot of luggage or children. Can be very busy and noisy. Trains can be cancelled and delayed. 	<ul style="list-style-type: none"> SCHEDULED FLIGHTS operate to a regular fixed timetable and travel between major airports and provide some services – e.g. Air France LOW COST AIRLINES offer very limited services and charge for most 'extras' such as refreshments, suitcases. They sometimes fly from less well-known airports CHARTER FLIGHTS one company pays the airline to operate the entire flight. Timetables may be irregular
Advantage of Road Travel	Disadvantages of Road Travel									
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Travel and Tourism

Unit 1

Knowledge Organiser

Key Facts

What types of sea travel exist?	What types of ACCOMMODATIONS to tourists tend to stay at?	What are the main purposes of VISITOR ATTRACTIONS in the UK?
<ul style="list-style-type: none"> Most people who travel by sea from the UK go on short ferry crossings, e.g. Dover to Calais or Holyhead to Dublin. Some crossings are longer (e.g. Portsmouth to Santander in Spain takes 24 hours) Most ferries accept cars and lorries/coaches Some people travel onboard as 'foot passengers' Some ferries are fast – e.g. Seacat Catamarans A small number of hovercraft services still operate – passenger only between Southampton and the Isle of Wight. 	<ul style="list-style-type: none"> Serviced accommodation <ul style="list-style-type: none"> Hotels Motels Guest houses/B&B's Non-serviced Accommodation <ul style="list-style-type: none"> Self Catering (e.g. apartments) Youth Hostels Caravans and campsites Holiday parks 	<ul style="list-style-type: none"> Entertainment – many purpose built visitor attractions are designed to give people a fun experience Education – some purpose built visitor attractions are there to educate people about the past, present or future. Leisure and recreation – the natural environment creates a place for outdoor activities e.g. climbing. Some leisure places are built for relaxation or healthy activities e.g. spa Conservation – these are attractions designed to protect the natural environment. They can also provide education and enjoyment Visitor Attractions provide a range of products and/or services; These include information and interpretation for people who cannot speak English, rides, exhibits, events, tours and guides, educational talks, hospitality and catering and souvenirs.

What types of visitor attractions exist in the UK?					Why else would people visit the UK?
Type of attractions	Definition	Example 1	Example 2	Example 3	
Natural attraction	A natural feature of the environment that is interesting to tourists. Some natural areas have been built to help protect the environment.	National Park 	Dorset coast 	Amazon rainforest 	
Purpose built attraction	A man-made attraction that has been built to attract tourists	London Eye 	Alton Towers 	Chester zoo 	
Heritage attractions	Attractions associated with history and/or culture. These can include: 1. Historic buildings or historic coastlines that were NOT built for tourists in the past however, they do attract tourists due to their history. 2. Places that contain pieces of history. E.g. museum. Heritage tourism may also help protect traditions and historic features.	Windsor Castle 	Manchester museum 	Stone Henge 	<ul style="list-style-type: none"> ARTS AND ENTERTAINMENT <ul style="list-style-type: none"> Mega events (e.g. the Olympic Games) Hallmark Events (regularly scheduled special events, e.g. Chelsea Flower Show) Major Events (those which attract national TV coverage, e.g. the Grand Prix) Local Events (which people in a specific area may know of, e.g. Derby Carnival) FESTIVALS are events which occur (usually) once per year and celebrate something special THEATRE: Drama, comedy, plays, musicals, ballet etc.



Travel and Tourism

Unit 1

Knowledge Organiser

Key Facts

Who leads and regulates the UK tourism industry?

Trade organisation (Letters)	Full name of the trade organisation	What they do.
CAA	Civil Aviation Authority	<ul style="list-style-type: none"> Regulate aviation (flying) Make sure that the air is managed safely and customers are protected.
ATOL	Air Travel Organisers' Licence	<ul style="list-style-type: none"> Financial protection scheme. Run by CAA. Ensures that travellers do not lose their money or become stranded abroad.
ORR	Office of Rail Regulation	<ul style="list-style-type: none"> Regulates health and safety on Britain's railways. Makes sure customers are treated fairly and gives taxpayers value for money.
ABTA	Association of British Travel Agents	<ul style="list-style-type: none"> Regulates British travel agents and tour operators. Ensures that customers receive a high standard of service. Has a fund to help repatriate stranded holidaymakers.
AITO	Association of Independent Tour Operators	<ul style="list-style-type: none"> Represent independent tour operators and travel agents. They want high levels of customer satisfaction and good quality service.
N/A	UK Inbound	<ul style="list-style-type: none"> Their aim is to encourage inbound tourism by helping members manage a successful business.

What are ANCILLIARY ORGANISATIONS?

- These are organisations or companies which can sell you a product to enhance/make better/support a travel experience. For example:
 - Car hire firms like Herz or Europcar
 - Travel Insurance such as Norwich Union
 - Price Comparison Sites
 - Airport Service Providers
 - Event Booking

What types of organisations operate in the UK tourism sector?

- Private: -Most organisations in the travel and tourism industry are privately owned by an individual or partners or by a group of people called shareholders. The main function is to make a profit, which can then be paid out to shareholders or kept by the owner. Profits can be made by selling more holidays, flights or other tourism products and services. Examples include; Tui, EasyJet, Haven and Hilton. Theme parks, travel agents and tour operators are all privately owned.
- Public: - Public sector organisations are run by the government. Their primary aim is to not make a profit; instead they exist to provide a service to the community by informing, educating and advising the customer
- Voluntary:- These organisations are often charities. They do not try to make a profit any money made funds their cause. They get their money from merchandise (things sold in shops), donations and grants. Some exist to educate the public, to promote a cause, educate and inform

What is HORIZONTAL INTEGRATION?

- HI is where a company in the travel and tourism sector buys-out, merges, or forms a company at a different stage in the holiday chain.
- For example, a travel agent may buy a tour operator, who has an airline, and between them, then invest in a chain of hotels and bring it all under one name/brand

What is VERTICAL INTEGRATION?

- VI is where a company buys another similar one in order to make it bigger/more dominant.
- This can reduce competition and force prices up.
- In the early 2000s, Ryanair (largest airline at Stansted) purchased an airline called BUZZ (the 2nd largest airline at Stansted)

What is COMMON OWNERSHIP and BUSINESS PARTNERSHIP?

- Common ownership is where one company owns multiple different organisations.
- Business partnerships see companies owned by different owners work in partnership with each other

What are the advantages of common ownership and business partnerships?

Advantages of Common Ownership and Commercial Partnerships

- Increases sales and money coming in due to more efficient business operations.
- Marketing and promotion (advertising) efforts are doubled, increasing customer and trade recognition (more people know who they are).
- Combined expertise helps companies to provide good customer care.
- Gives them more power over suppliers (because they are buying more, suppliers don't want to lose them as customers so make their prices cheaper).
- Enables greater economies of scale (when making larger quantities of one thing it costs less to make each one), this happens because they are selling more of the same product
- Shared resources (things all the business can share)
- Wider customer base (more customers).



What are the disadvantages of common ownership and business partnerships?

Disadvantages of Common ownership and commercial partnerships:

- Size of operation, it becomes too big to manage properly.
- Less competition means that the customer has less choice.
- Loss of personalised customer care
- The company ends up monopolising the market (having most of the customers) so it has more control over the whole industry.
- Inflexibility, not easy for them to change products to meet changing customer wants and needs.
- Can lead to large scale redundancies (people losing their jobs) if the company decides to close branches and offices



How can consumer technology benefit the industry?

- Online bookings – available 24/7
- Virtual tours
- Online check-in for flights etc
- Self-service ticketing machines
- M-Tickets/E-Tickets
- Websites

Gross motor development:

- Newborns are born with reflexes – sucking, rooting, startling, grasping – which help them survive. Movements are uncontrolled and uncoordinated:
- at three months able to lift up head and chest when on their stomachs and bring hands together over body
- at six months can roll over from back to front
- at nine months can sit unsupported and is usually mobile by crawling or rolling, may pull up to stand alone and walk by holding on to furniture
- at twelve months pulls up to stand, stands alone, walks holding on to furniture.

Fine motor development:

- No coordinated movement but newborns will grasp things put into their hands as a reflex action
- at three months can watch their hands and hold a rattle for a moment
- at six months can reach for a toy and move a toy from one hand to the other
- at nine months can use a pincer grasp (index finger and thumb) to grasp objects, can deliberately release objects by dropping them
- at twelve months can use pincer grasp to pick up small objects, points using index finger.



Emotional and social development:

- at one month can focus on human faces with interest
- at six weeks can smile
- at three months enjoys being held and forms indiscriminate attachments
- at six months can recognise and respond to emotions in others
- from seven to eight months can form specific attachments and show wariness of strangers
- from eight months develops specific attachments and imitates actions of others, such as clapping
- from eight months experiences separation anxiety from primary carer(s).

Cognitive development:

- at one month ‘freezes’ if hears a sound played softly
- at three months can recognise familiar routines, alert and follows movement with eyes if objects are close
- at six months can explore objects by putting in mouth, recognises voices
- at eight or nine months can look for dropped objects and objects that they see being hidden
- at twelve months enjoys throwing toys to the ground and watching their descent, learns by trying things out and repeating if successful. This approach to learning is called ‘trial and error’

Communication and language development:

- at one month can turn head to adult voice, at six weeks begins to coo
- at three months smiles when hears a familiar voice
- at six months makes short babbling sounds, such as ‘da’ and ‘ba’
- at nine months understands ‘no’, vocalises in long strings of babbling
- at twelve months knows own name and understands simple instructions

Development: Birth – 12 months



Gross motor development:

- at fifteen months can crawl upstairs and may walk hesitantly
- at eighteen months can walk unaided, can walk upstairs with help and can squat to pick up toys
- at two years can run, climb onto furniture and use sit-and-ride toys
- at two and a half years can kick a large ball and can jump with two feet together from a low step
- at three years able to run forwards and backwards, steer and pedal a tricycle, walk upstairs with alternate feet and throw a large ball.

Fine motor development:

- at fifteen months pincer grasp is precise, uses palmar grasp to hold crayons
- at eighteen months can build a tower of three bricks, can feed self with a spoon and scribble using a crayon in palmar grasp
- at two years can draw dots and circles, can put on shoes and fasten with Velcro® but not buckles and laces
- at two and a half years starts to show a hand preference, can pull down items of clothing and starting to develop tripod grasp
- at three years can use tripod grasp, draw a circle, hand preference is established for most tasks.



Development: 12 month – 3 years

Cognitive development:

- at fifteen months explores objects by sight and sound
- at eighteen months very curious to explore environment, remembers where things belong
- at two years recognises self in mirror, can remember past experiences
- at two and a half years recognises self in photographs, with help can complete simple puzzles
- at three years understands the difference between past and present, can complete simple puzzles

Communication and language development:

- at fifteen months communicates by pointing and vocalising, has up to six words
- at eighteen months has around 15 words, able to communicate wishes, understands simple requests
- at two years has up to 50 words, able to join words, enjoys looking at books
- at two and a half years has around 200 words, starting to use simple sentences, asks questions, uses personal pronouns, plurals and negatives
- at three years speech is clear to anyone unfamiliar with child, enjoys books and turns pages.

Emotional and social development:

- at eighteen months emotionally dependent on parents and key persons, plays alone but enjoys being near adults and siblings, insistent on immediate attention to needs and can copy adult actions
- at two years unable to wait for needs to be met, may be distracted from tantrums, plays in parallel with other children but unable to share toys
- at two and a half years plays alongside other children and engages in onlooker play, very dependent on adults and jealous of other children gaining attention, responds well to adult attention and praise and has tantrums when frustrated
- at three years finds it easier to wait, starting to take turns and share, enjoys being with other children and will comfort another child.

Gross motor development:

- from three to four years can hop on one foot, walk along a line, aim and throw a ball and kick it with force, ride a tricycle using pedals
- from four to five years can run avoiding obstacles, skip with a rope, throw a large ball to partner and catch it.

Fine motor development:

- from three to four years can button and unbutton clothes, use scissors to cut out simple shapes, draw a person with head, trunk and legs, eat with a knife and fork, thread beads to make a necklace
- from four to five years can form letters, write own name and colour in pictures.

Cognitive development:

- from three to four years can recognise and name primary colours, understands what is meant by 'more', can tell whether an object is heavy or light, arranges objects into categories, makes a connection between people and events
- from four to five years can count accurately up to 10, can add two sets of objects together, can match equal sets, understands the need for rules, names the time of day associated with activities.

Communication and language development:

- from three to four years, speech can be easily understood, although some words may be incorrect, uses questions and by four years language is fluent, with some speech immaturities
- from four to five years can count accurately up to 10, uses complex sentences with words such as 'because', can talk about what has happened and what might happen, uses language to argue and answer back.

Emotional and social development:

- from three to four years can cope with separation from primary carer with someone they know, is beginning to play cooperatively and show clear friendship preferences, and plays with others
- from four to five years can work out what other people may be thinking, which helps them to negotiate with others, able to understand the need for rules, develops close friendships develop, behaviour mostly cooperative and separates more easily from parents.

Development: 3 – 5 years





Gross motor development:

- from five to eight years can hop, skip and jump confidently, can swerve and dodge when running, balance on a beam, ride a bicycle and use roller skates
- coordination is more proficient, allowing for tasks that require coordinated movements including improved ball skills, swimming activities, hopscotch.

Cognitive development:

- from five to eight years can recognise numerals up to 100, do simple calculations, show simple reasoning and be reasoned with
- from seven years can ‘conserve’ quantities and numbers, complete a simple maze, is starting to tell the time, understands the need for and uses rules.

Emotional and social development:

- from five to six years starts to compare self with others and becomes more aware of the feelings and needs of others
- confidence in self may be shaken by ‘failure’
- from five to seven years has strong friendships, often of the same gender, can understand that others have different viewpoints than them, can read facial expressions of others accurately and recognise what others might be feeling.

Development: 5 years – 8 years

Fine motor development:

- from five to eight years can tie and untie shoelaces, and accurately cut out shapes
- from six years able to thread a large-eyed needle and sew large stitches, has good control over pencils and paintbrushes, allowing for more detailed drawings and clear handwriting.

Communication and language development:

- from five to eight years uses language to reason and explain ideas, understands and enjoys jokes and riddles
- uses more complex sentence structures and asks what, when, who, where, how, why questions
- from seven years has mastered the basics of reading and writing.





Unit 2 – Managing a Music Product

Learning Aims for this Unit:

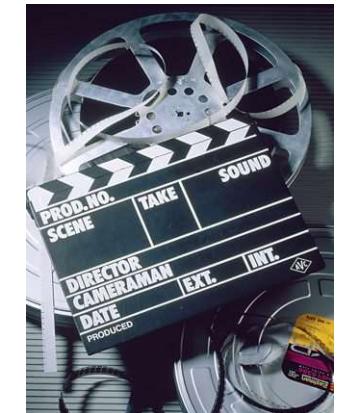
- A Plan, develop and deliver a music product
- B Promote a music product
- C Review the management of a music product.

How is this unit marked?

PASS – You make a POSITIVE CONTRIBUTION throughout, you DESCRIBE in your review.

MERIT – You make a CONSISTENT CONTRIBUTION throughout, you EXPLAIN in your review.

DISTINCTION – You make a SIGNIFICANT CONTRIBUTION throughout, you JUSTIFY in your review.





Planning Factors:

Target audience – Who is the event aimed at?

Artistic intention – As performers/a production team, what do we want to achieve?

Type of venue – Where will the event be held?

Purpose – Does it have a theme? What is the reason for the event?

Selection of repertoire – What items will be in the show?

Technical aspects of the venue – Think about the size, type of venue, location, equipment and resources available, health and Safety?

Availability and allocation of technical support – Have you thought who will run the equipment on the night and during rehearsals?

Time constraints – How long will it take to set up, when do you need to have rehearsals, what is the length of performance?

Availability of performers and other personnel – Do we have the performers we need? Are all job roles covered?

Awareness of copyright issues – What licenses do we need?

Keyword	Definition
RISK ASSESS	Workout the potential for harm and determine safe practice
COLLEAGUES	A person you work with in a professional setting
TIMEKEEPING	Being punctual/being on time
DEADLINES	The time/date when a task needs to be completed by
REHEARSAL	Practising before a performance
REPERTOIRE	Items a performer prepares for a concert
PROFESSIONAL	Being skilful and assured
CONSTRUCTIVE	Having a useful purpose
POSITIVE	Being constructive, optimistic and confident
CONSISTENT	Keeping something up over time
SIGNIFICANT	Important, being worthy
CONTRIBUTION	Working with others to bring together a result
TIMESCALES	The time allowed to be taken



Online Development with Promotion:

MOBILE DEVICES – iPhone and Android now dominate promotion methods: apps, instant global access, push notifications

STREAMING – Spotify, We7: instant access, subscriptions, adverts, new music, huge library

SOCIAL MEDIA – Facebook, Instagram: Band/artist posts, videos, fan pages, discussion forums etc.

ONLINE DISTRIBUTION – iTunes: search a huge library, pay and download music to keep. No need to visit stores or buy physical copies of albums.

Methods of Promotion:

- Websites
- Social Media
- Leaflets
- Posters
- News/Media
- Radio/TV
- Merchandise

Measuring the success of Promotion:

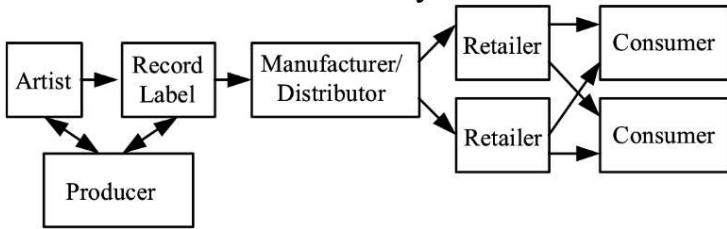
- **Sales: tickets, merchandise, albums**
- **Audience interest: sharing online material, becoming a talking point**
- **Audience response: reviews, customer feedback, reactions**
- **Attendance: Do people turn up to the event at the right time and location? Did they have the right information?**



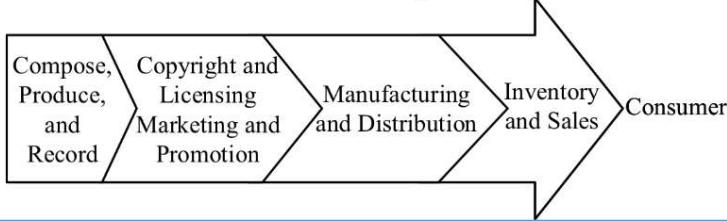
**What is Promotion?**

Definition: The publicizing of a product, organization, or venture so as to increase sales or public awareness.

Traditional Music Industry Market Structure



Traditional Music Industry Value Chain

**Keywords**

RISK ASSESS

COLLEAGUES

TIMEKEEPING

DEADLINES

REHEARSAL

REPERTOIRE

PROFESSIONAL

CONSTURCTIVE

POSITIVE

CONSISTENT

SIGNIFICANT

CONTRIBUTION

TIMESCALES

Measuring the success of Promotion:

- **Sales: tickets, merchandise, albums**
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BTEC Sport

at Da Vinci Academy

Knowledge Organiser

Unit 1 BTEC Sport Level 2

Introduction to fitness for Sport and exercise

All sports performers want to be the best they can be. To reach optimal levels requires years of dedication to training, including successfully overcoming any barriers (such as injury) which might prevent a performer from achieving their goals. Working closely with their coach, the performer will gain an appreciation and understanding of the different fitness components, training principles, training methods and fitness tests which can be incorporated into their training regime to further enhance and improve their sports performance. Physical and skill-related fitness components, including aerobic endurance, body composition and power, are related to positive health and wellbeing. Sports performers train regularly to improve and maintain their fitness levels and performance. Their training programmes are tailored to their specific training needs and their sport. A performer's training cycle can incorporate lots of different fitness training methods, such as circuits for muscular strength and endurance. Incorporating different fitness training methods keeps training interesting, which helps to keep motivation levels high.

Components of physical fitness

Speed: distance divided by time. Speed is measured in metres per second (m/s). The faster an athlete runs over a given distance, the greater their speed.

Muscular Strength: The maximum force (in kg or N) that can be generated by a muscle or muscle group.

Flexibility: having an adequate range of motion in all joints of the body; the ability to move a joint fluidly through its complete range of movement.

Body composition: The relative ratio of fat mass to fat-free mass (vital organs, muscle, bone) in the body.

Aerobic Endurance: The ability of the cardiorespiratory system to work efficiently, supplying nutrients and oxygen to working muscles during sustained physical activity.

Muscular Endurance: The ability of the muscular system to work efficiently, where a muscle can continue contracting over a period of time against fixed resistance.



Fitness for Sport and Exercise



Types of stretching

Static
Dynamic
Active
Passive
PNF
(Proprioceptive Neuromuscular Facilitation)



Exercise intensity

- Intensity – Exercise Intensity refers to how hard you are working. To measure this you need to know your heart rate (HR) and apply HR intensity to fitness training methods.
- Target zones and training thresholds should be used to calculate target training zones and apply HR max to training: $HR\ max = 220 - age$.
- 60–85% HR max is the recommended training zone for cardiovascular health and fitness. Cardiovascular fitness is the capacity of the cardiovascular system (heart, lungs and vessels) to efficiently supply oxygenated blood to working muscles. Cardiovascular fitness is how well and efficiently your blood circulates through your body.
- The Borg (1970) (6–20) Rating of Perceived Exertion (RPE) Scale is a simple method of rating perceived exertion and can be used by coaches to gauge an athlete's level of intensity in training and competition. Perceived exertion is an individual's rating of exercise intensity, formed by assessing their body's physical signs such as heart rate, breathing rate and perspiration/sweating, be used as a measure of exercise intensity.
- FITT: Frequency, Intensity, Time and Type. It is important that this is applied to training to ensure progress is made.

FITT



1 - 10 Borg Rating of Perceived Exertion Scale	
0	Rest
1	Really Easy
2	Easy
3	Moderate
4	Sort of Hard
5	Hard
6	
7	Really Hard
8	
9	Really, Really Hard
10	Maximal: Just like my hardest race

Principles of training

- Progressive Overload: In order to progress, training needs to be demanding enough to cause the body to adapt, improving performance.
- Specificity: Training should be specific to the individual's sport, activity or physical/skill-related fitness goals to be developed.
- Individual differences/needs: The programme should be designed to meet individual training goals and needs.
- Adaptation: How the body reacts to training loads by increasing its ability to cope with those loads. Adaptation occurs during the recovery period after the training session is completed.
- Reversibility: If training stops, or the intensity of training is not sufficient to cause adaptation, training effects are reversed.
- Variation: It is important to vary the training regime to avoid boredom and maintain enjoyment.
- Rest and recovery are required so that the body can recover from the training and to allow adaptation to occur.



The importance of fitness testing

- Fitness testing is important as it allows participants to be given a baseline, this data can then be interpreted and used to create a training program.
- Fitness testing allows participants to compare themselves to normative and published data. This allows for participants to set goals.
- Monitoring data will allow participants to demonstrate physical improvement.
- Tables of results allow for comparison.
- It's important that tests are reliable, valid and relevant.
- Results can give a performer something to aim for/goal setting.



Fitness test methods for components of fitness:

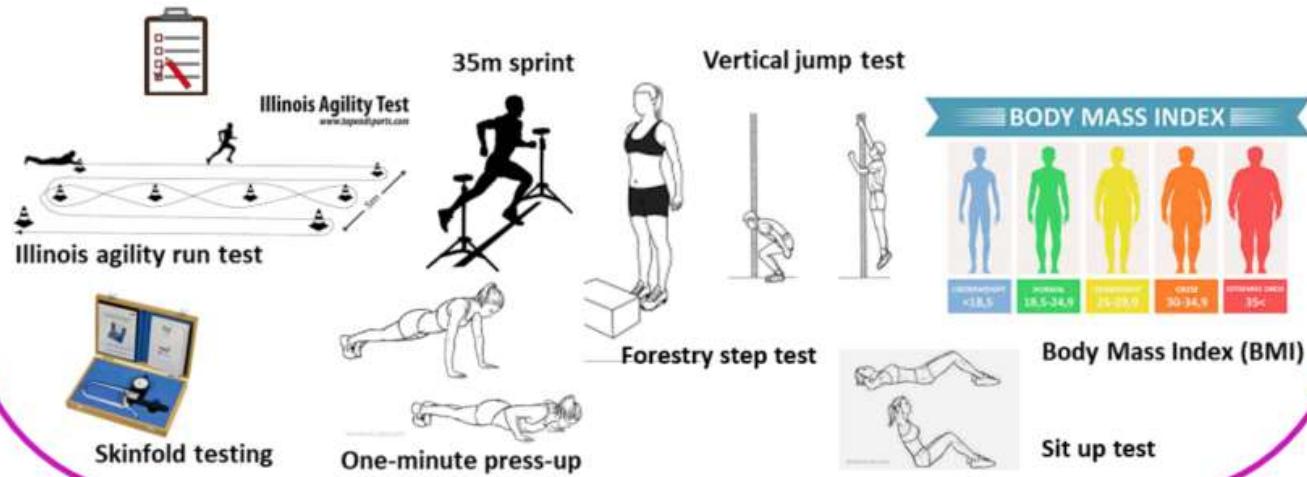
- Flexibility: sit and reach test (usually measured in cm or inches)
- Strength: Grip Dynamometer (usually measured in KgW)
- Aerobic endurance:
 - Multi-stage fitness test, known as the bleep test (usually predicted in ml/kg/min)
 - Forestry step test (usually predicted in ml/kg/min) .Definition of VO₂ max (ml/kg/min): the maximum amount of oxygen uptake, usually measured in ml of oxygen per kg of body mass per minute. It is a measure of cardiorespiratory endurance.
- Speed: 35m sprint (usually measured in s)
- Speed and agility: Illinois agility run test (usually measured in s)
- Anaerobic power: vertical jump test (usually measured in kgm/s)
- Muscular endurance: one-minute press-up, one-minute sit-up (usually measured in number of reps/minute)
- Body composition: Body Mass Index (BMI) (usually measured in kg/m²). Skinfold testing via the Jackson-Pollock nomogram method for prediction of percent body fat .
(sites for males: chest, abdominal and thigh; sites for females: triceps, suprailiac and thigh).



Sit and reach test



Grip Dynamometer





BTEC Sport

at Da Vinci Academy

Knowledge Organiser

Unit 2 BTEC Sport Level 2



Pearson
BTEC

Participation in sport

Participation in sport continues to grow, as people become more aware of the benefits of physical activity. Engaging young people through sport is a key political agenda, both because current national health statistics show that obesity in young children is rapidly increasing and also because we strive for excellence and success at major sporting events. Sport is an activity involving physical exertion and skill in which an individual or team competes against another or others for entertainment. Physical Activity simply means movement of the body that uses energy. Walking, running, climbing the stairs, playing football, or dancing are all good examples of being active. For health benefits, physical activity should be moderate or vigorous intensity. This means getting the heart and lungs working.



Rules (or laws)

Rules (or laws) as regulated by the national or international governing body for the sport. For example, the Fédération Internationale de Football Association (FIFA) laws of football, the International Rugby Board (IRB) laws of rugby, the Badminton World Federation (BWF) rules of badminton, and the International Orienteering Federation (IOF) rules of orienteering. Rules keep everyone safe and make sure the game or sport is done fairly.



Rule example :
In Football you can't touch the ball with your hand during play.



Regulations

For example, relating to players and participants, equipment, playing surface, facilities, health and safety, time, officials (referee, umpire, judge, starter, timekeeper). For example all Netball players should be wearing the correct kit on court. This kit should be specified before a game so that the opposition has a contrasting kit and they won't clash or get confused. In addition all players should remove jewellery. Plus play in the correct footwear, this is also the same for football.



Roles of officials

For example, the roles of umpires, referees, referees' assistants, judges, timekeeper, starters, table officials, third umpire, fourth official.



Responsibilities of officials

For example, appearance, equipment, fitness, qualifications, interpretation and application of rules, control of players, accountability to spectators, health and safety(equipment, facilities, players), fair play, use of technology, effective communication(voice, whistle, signals).



Practical Sports Performance

Review performance

- Strengths and areas for improvement: components of fitness, skills and techniques, specific to the sport and non-specific, e.g. fitness.
- Self-analysis: completion of observation checklist, e.g. use of video.
- Strengths and areas for improvement: tactics, the effectiveness of decision making.
- Activities to improve performance (**short-term and long-term goals**): e.g. training programmes, use of technology, attending courses, where to seek help and advice.



Safe and appropriate participation

The demonstration of skills, techniques and tactics within a controlled environment, for example no competition, drills, set plays.



Top Tips

1. Wear protective gear, such as helmets, protective pads, and gum shields.
2. Warm up and cool down.
3. Know the rules of the game.
4. Watch out for others.
5. Don't play when you're injured



Strategies and tactics

Are often pre-arranged and rehearsed, especially in team games. Performers also need to be able to adapt or change them during a performance. This requires good problem-solving and decision-making skills. Good observation and tactical awareness are important while both playing and analysing play.

For example taking a fast centre pass in ball or double marking an attacking player.





BTEC Sport

at Da Vinci Academy

Key Works Unit 2

Participation:- To take part in a sports or activity. You can have high and low levels of participation.

Performance:- Sports performance is the manner in which sport participation is measured. Sport performance is a complex mixture of skills training and techniques.

Fitness:- Is being physically fit and healthy. Adults and children can have different levels of fitness. Fitness is something that you can improve.

Observation:- A observation is the process of closely observing or monitoring something or someone. For example watching a specific player in football and making specific notes.

Techniques:- A technique is the method ,technique that procedure a way something is done. An example of techniques being your knees when taking a set shot.

Self –Analysis:- Is where you would review your own performance to understand his or her own personality/performance without the aid of another person.

Governing Body:- A governing body is a an organisation that governs and administers a sport . For example the FA or England Hockey or swim England.

NHS:- National Health Service. It refers to the Government-funded medical and health care services that everyone living in the UK can use for FREE!



Goal setting



Specific

S



Measurable

M



Attainable

A



Realistic/ Relevant

R



Time-bound

T

Short Term

*

Long term

Observation checklist

For example, to review performance in selected sports using video analysis:

- components of physical fitness
- technical demands of sport (skills and techniques)
- production of a checklist suitable for self-analysis of performance in selected sports
- tactical demands of sport



Isolated Practices

For example, skills and techniques demonstrated independently without any pressure or external forces, completed successfully and without fault.

Conditioned practices

For example, small-sided games, a limited number of touches, a set number of defenders or attackers.

Competitive situations

- Full-sided games.
- Appropriate opposition
- With match officials.
- Personal performance that contributes to relevant use of skills, techniques and tactics in relation to:



1. communication
2. Individual role
3. responding to team mates and/or opposition.



Observation Checklist		Comments:
Defence		
Speed		
Aerobic Endurance		



Effective use of skills and techniques.

For example: rugby conversion, including head position, body position, placement of non-kicking foot, placement of kicking foot, connection with the ball.

Technique is so important for all sports and its important that you break it down into specific parts.



Components of Physical Fitness



Components of Physical Fitness



Aerobic endurance: (the ability of the cardiorespiratory system to work efficiently, supplying nutrients and oxygen to working muscles during sustained physical activity)

Muscular endurance: (the ability of the muscular system to work efficiently, where a muscle can continue contracting over a period of time against a light to moderate fixed resistance load)

Flexibility: (having an adequate range of motion in all joints of the body; the ability to move a joint fluidly through its complete range of movement)

Speed: (distance divided by the time taken. Speed is measured in metres per second (m/s). The faster an athlete runs over a given distance, the greater their speed)

Muscular strength: (the maximum force (in kg or N) that can be generated by a muscle or muscle group)

Body composition: (the relative ratio of fat mass to fat-free mass (vital organs, muscle, bone) in the body)



The application of the components of fitness to a chosen sport.

Example :- Football requires foot speed and muscular strength to allow the player to reach the ball before their opponent and hold them off the ball to keep possession. For example, long distance running requires good aerobic endurance to supply oxygen and nutrients to working muscles during a race as well as a low body composition to ensure fat mass is low so that the distance can be covered more easily.



SCHOOL LOGO



Component 1 Aerobic & Anaerobic Exercise

Aerobic exercise:

- Uses oxygen for energy production
- Includes activities that are of a long duration
- Includes activities that are of a moderate intensity

Sports and activities:



Long distance cycling



Marathon running



Triathlon



Long distance rowing

Aerobic equation:



Glucose and oxygen are used to release energy aerobically. This process produces carbon dioxide, water and heat (and energy)

Anaerobic exercise:

- Does not use oxygen for energy production
- Include activities that are of a short duration
- Includes activities that are of a high intensity

Sports and activities:



Shot put



Sprinting



Long jump



Weight lifting

Anaerobic equation:



Lactic acid is produced as a waste product when carbohydrates are broken down without oxygen during anaerobic respiration

Energy Sources

Carbohydrates

- They are an energy source for both aerobic & anaerobic activities
- Doesn't need oxygen to break down into glucose
- Doesn't give as much energy as fats
- Quicker to break down and release more energy than fats



Fats

- They are an energy source for aerobic activities
- They require oxygen to break down the fat into energy (a type of glucose)
- They are slow to break down
- Once broken down they give large quantities of energy



Component 1 Short Term Effects of Exercise

Short term effects of exercise are the ways your body responds as it starts to exercise. These changes happen so that the body can meet the increased demands to the exercise undertaken

Muscular System:



- Muscle fatigue
- Lactate accumulation
- Oxygen deficit

When we start to exercise there is a demand for energy. When we work anaerobically, we get muscle fatigue and a build-up of lactic acid. This will create an oxygen deficit

Cardiovascular System:



- Increase in heart rate
- Increase stroke volume
- Increase blood pressure
- Increase cardiac output
- Vascular shunting occurs

Respiratory system:



- Increase depth of breathing
- Increase rate of breathing
- Increase gas exchange
- Increase in tidal volume
- Oxygen deficit

The cardiovascular system & respiratory system work together

When we exercise the demand for oxygen and the removal of carbon dioxide increases. This will increase breathing rate and depth and the rate of gas exchange

Because oxygen is needed for the working muscles, vascular shunting occurs

Heart rate is increased as the blood transports the oxygen and carbon dioxide. This increases blood pressure, stroke volume and heart rate

$$\text{Cardiac output} = \text{Stroke Volume} \times \text{Heart Rate}$$

Stroke volume = Amount of blood pumped from the heart in 1 beat

Heart rate = Amount of time the heart beats per minute

Cardiac output = Amount of blood pumped from the heart in 1 minute

Component 1 The Cardiovascular System

Functions of the cardiovascular system:

The cardiovascular system consists of the:

- The heart** pumps blood around the body
- Blood** transports gasses, blood cells and nutrients
- Blood vessels** carry the blood

Function	Explanation
Transport of nutrients	Nutrients we eat are broken down from the food we eat and transported to the body in the blood
Transport of oxygen	The cardiovascular system transports oxygen around the body in the blood Oxygen is needed to provide energy to the working muscles during aerobic exercise
Transport of carbon dioxide	Carbon dioxide is produced as a by-product during aerobic energy production. The cardiovascular system takes carbon dioxide away from the muscles to the lungs and exhaled.
Clotting of open wounds	Blood contains blood cells called platelets. They are transported in the blood. They help to clot wounds by performing a plug to prevent blood loss
Regulation of body temperature	Blood vessels can help regulate body temperature. When we get hot blood vessels near the skin will get bigger (vasodilation) this will increase blood flow so heat can radiate from the skin When we get cold the blood vessels near the skin will get smaller (vasoconstriction) this will decrease blood flow so less heat is lost through radiation

Redistribution of blood flow:

Vascular Shunting: When we exercise blood is redistributed. The working muscles need more oxygen than other inactive areas of the body such as the stomach. Blood is diverted away from inactive areas to the working muscles.

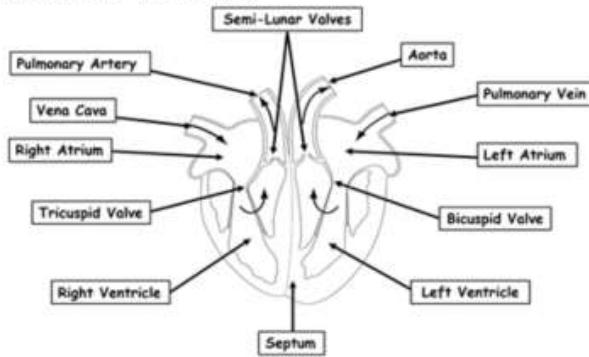


Vasoconstriction means that the blood vessels constrict to make them smaller. Chemical changes signal the nervous system to **constrict** blood vessels to **inactive** areas.



Vasodilation means that the blood vessels dilate to make them bigger. Chemical changes signal the nervous system to **dilate** blood vessels that supply active areas.

Structure of the heart:



Septum separates the right and left sides of the heart

Valves prevent the backflow of blood

Arteries take blood away from the heart

Veins take blood towards the heart

Pulmonary artery take blood to the lungs

Pulmonary vein takes blood from the lungs back to the heart

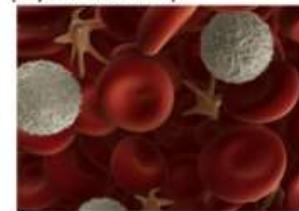
Aorta delivers oxygenated blood to the body

Structure of blood vessels:

Blood Vessel	Structure	Importance During Physical Activity
Artery	<ul style="list-style-type: none"> Thick muscular walls Thick elastic walls Small lumen (internal diameter) Carry blood at high pressure Carry blood away from the heart Usually carry oxygenated blood (except the pulmonary artery) 	When we exercise, blood pressure increases due to the demand for oxygen from the working muscles. Arteries take the blood to the working muscles. They dilate to allow more blood through
Vein	<ul style="list-style-type: none"> Thin walls Large lumen (internal diameter) Carry blood at low pressure Contain valves Mainly carry deoxygenated blood (except the pulmonary vein) 	When we exercise aerobically the body produces waste products such as carbon dioxide. The blood in the veins take this to the lungs to be exhaled. The valves in the veins prevent the back flow of blood at low pressure
Capillary	<ul style="list-style-type: none"> Very thin walls (one cell thick) Small lumen (internal diameter) Link smaller arteries with small veins Allow gaseous exchange 	When we exercise, we need to deliver oxygen to the working muscles and remove the waste product, carbon dioxide. Capillaries allow the gaseous exchange at the lungs and the muscles

Function of blood:

Blood has four components that each play a role in physical activity:



Red blood cells

Red blood cells carry oxygen and carbon dioxide.

The oxygen binds with haemoglobin in the blood. It is then transported to the working muscles by the plasma

The waste product carbon dioxide is also transported by the red blood cells, it is also carried by the plasma

White blood cells

White blood cells fight infection and disease. When playing sport, they prevent infection if we get cut or scratched. They also keep us healthy so we are fit to train and take part in physical activity

Platelets

Platelets help prevent bleeding by clotting (sticking together) and forming a plug. This is important to allow performers such as boxers to stop the bleeding if they get a cut, allowing them to continue performing

Plasma

Plasma is the liquid part of the blood it acts as a transport system that transports the blood cells, platelets and nutrients to different parts of the body

Component 1 The Muscular System

Classification of muscles:

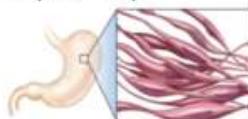
Voluntary muscles

- Found on the skeleton e.g. biceps triceps & quadriceps
- Conscious control
- Attach to the skeleton to create movement



Involuntary muscles

- Found in the stomach, intestines & blood vessels
- Unconscious control
- Contract slowly and rhythmically

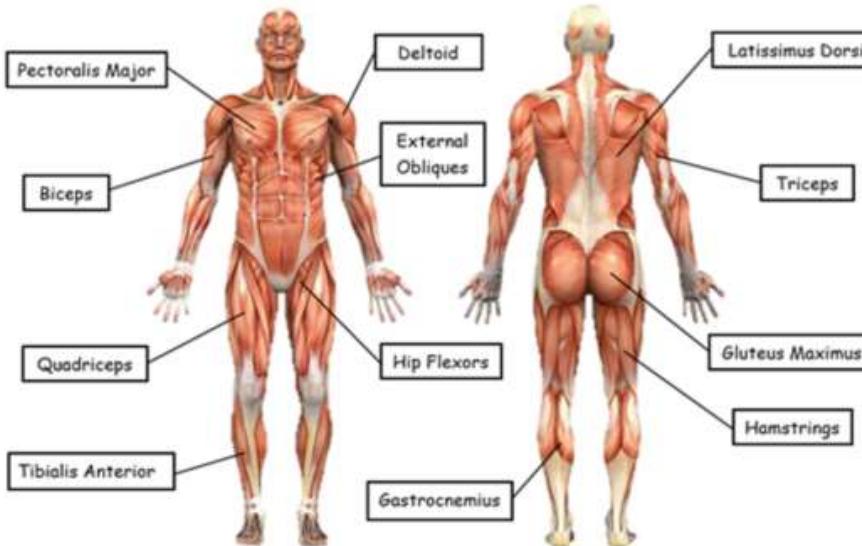


Cardiac muscle

- Found in the wall of the heart
- Unconscious control
- Do not tire



Voluntary muscles of the body:



Muscle fibres:

Type I (Slow Twitch)

- Aerobic events
- Marathon running

Type IIa (Fast Twitch)

- 400m race

Type IIx (Fast Twitch)

- Anaerobic events
- 100m sprint

Characteristic	Slow Twitch Type I	Fast Twitch Type IIa	Fast Twitch Type IIx
Force of Contraction	Low	High	Very high
Speed of Contraction	Slow	Medium	Fast
Resistance to Fatigue	High	Moderate	Low
Aerobic or Anaerobic	Aerobic	Aerobic & Anaerobic	Anaerobic
Myoglobin	High	Medium	Low
Mitochondria	High	Medium	Low
Capillary Network	Good	Moderate	Low

Antagonistic muscle pairs:



When we bend the elbow (flexion) the biceps contract and the triceps relax
 Agonist = Biceps
 Antagonist = Triceps



When we straighten the elbow (extension) the triceps contract and the biceps relax
 Agonist = Triceps
 Antagonist = Biceps

Other antagonistic pairs include:

- Quadriceps & Hamstrings
- Hip flexors & Gluteus Maximus
- Gastrocnemius & Tibialis Anterior

The skeletal system and muscular system work together. Bones provide anchors for muscles to attach. Muscles attach to bone through tendons, when muscles contract, they pull on bones to create movement.

Component 1 The Skeletal System

The functions of the skeleton:

1. Protection of vital organs

Cranium protects the brain when heading a ball



2. Muscle attachment

Bones provide anchors for muscles to attach.



3. Joints for movement

Bones act as levers to create movement.



4. Platelets

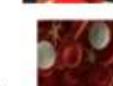
Platelets clot blood when we are cut to stop the bleeding.



5. Blood cell production

Red blood cells carry oxygen

White blood cells fight infection.



6. Store calcium & phosphorus

Calcium and Phosphorus is stored in the bones to keep them strong.



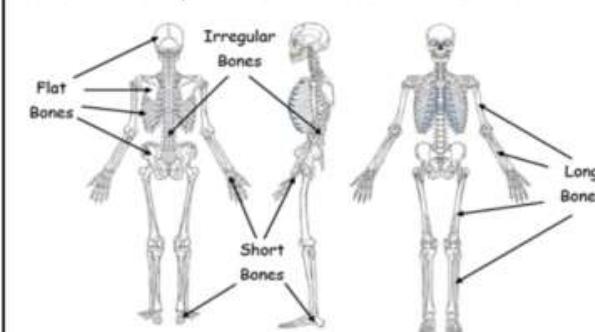
Classification of bones:

Long bones act as levers so we can move. Examples are the humerus, ulna and femur.

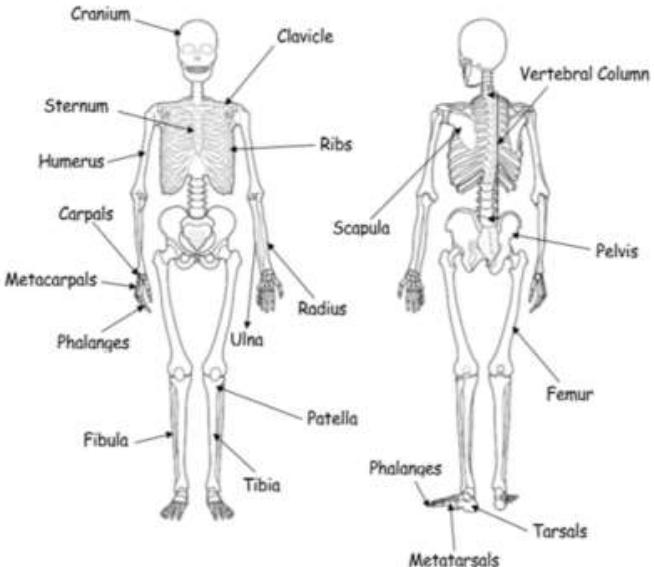
Short bones are important for weight bearing and to absorb shock Examples are the carpal and tarsals.

Flat bones usually protect organs. Examples are the ribs, pelvis and scapula.

Irregular bones have odd shapes and perform a range of functions. Examples are the bones of the vertebrae.



Structure of the skeleton:



Movement possibilities at joints:

Flexion: bending movement (decreases angle)

Extension: Straightening movement (increase angle)

Abduction: Moving away from midline

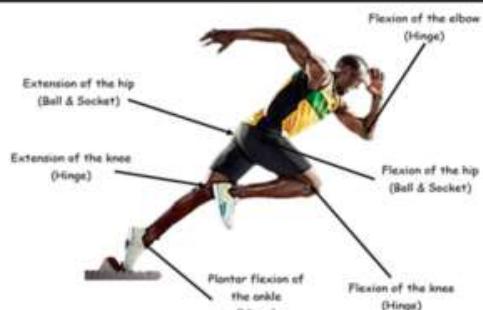
Adduction: Moving towards the midline

Plantar flexion: Pointing the toes downwards

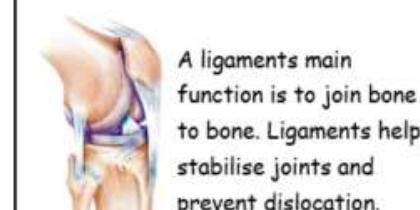
Dorsi flexion: Pointing the toes upwards

Rotation: Rotation around a joint or axis

Circunduction: flexion/extension Abduction/adduction



The role of ligaments and tendons:

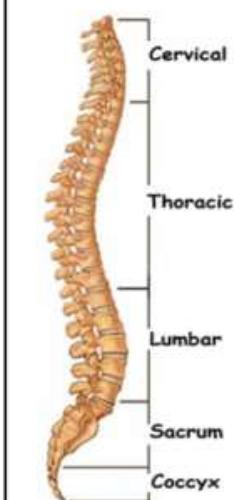


A ligament's main function is to join bone to bone. Ligaments help stabilise joints and prevent dislocation.



Tendons attach muscle to bone. Tendons help provide powerful movements such as kicking, jumping and

Vertebral column:



Classification of joints:

Hinge

E.g. Elbow & Knee



Ball & Socket

E.g. Hip & Shoulder



Condyloid

E.g. Wrist



Pivot

E.g. Neck (axis & Atlas)

