

CHRIST THE KING KNOWLEDGE ORGANISERS

➤ #CtKCares

Year 8
Lent Term 1





SELF-QUIZZING

Why should I self-quiz?

Your mind is split into two parts: the working-memory and the long-term memory. Everybody's working-memory is limited, and therefore it can very easily become overwhelmed. Your long-term memory, on the other hand, is effectively limitless.

You can support your working memory by storing key facts and processes in long term memory. These facts and processes can then be retrieved to stop your working memory becoming overloaded.

This booklet contains knowledge organisers for all of your subjects. Each knowledge organiser has the key information that needs to be memorised to help you master your subject and be successful in lessons.

How often should I self-quiz?

Research shows that regular testing improves knowledge retention; in order to learn the information in your knowledge organiser, you will need to work with it more than once! There are many different ways to learn the material in your knowledge organiser.

How to use my Knowledge Organiser

1. Cover – Write – Check: Cover up one section of the knowledge organiser, and try to write out as much as you can from memory. Check the knowledge organiser to see if you are right; correct any mistakes and fill in any missing information in your green pen.

Repeat this process at least twice to fill your page. You could also include content from the previous week's homework – especially if there were some parts you struggled with.

2. Draw a mind map, jotting down everything that you can remember from the knowledge organiser. Check accuracy, correct in green pen and then repeat.

3. Revision clock – draw a clock and add the topic in the middle. Break the clock face into 10 minute sections. Add notes from the knowledge organiser in each section. Cover the clock and recite the information aloud.

4. Use your knowledge organisers to create flashcards. These could be double sided with a question on one side and the answer on the other. Alternatively, a keyword on one side and a definition on

QUICK FACT

Did you know

Research shows students remember 50% more when they test themselves after learning something

50%





HOMework SCHEDULE

You should complete at least one hour of Home Learning per school day.

This will consist of:

- Knowledge Organiser and Online Learning as directed by your teachers.
- If you have no tasks set, carry out Knowledge Organiser activities as per the Knowledge Organiser timetable below.
- Two periods of 20 minutes reading each week

Week 1					
20 Minutes Per Subject	Monday	Tuesday	Wednesday	Thursday	Friday
Subject 1	English	Science	Maths (MyMaths)	Maths	English
Subject 2	RE	Music	RE	Science	Geography
Subject 3	PE	History	Technology	MFL	Art

Week 2					
20 Minutes Per Subject	Monday	Tuesday	Wednesday	Thursday	Friday
Subject 1	Science	English	RE	Maths (MyMaths)	Science
Subject 2	RE	Music	ICT	Drama	Geography
Subject 3	PE	History	Technology	MFL	Art

Read **20 minutes** a day and you'll read **1,800,000 words** per year.

READING FOR **6 MINUTES A DAY** REDUCES STRESS BY 68%.

Children learn **4,000 to 12,000 words** per year through reading.



WHAT ARE THE HOMEWORK EXPECTATIONS?

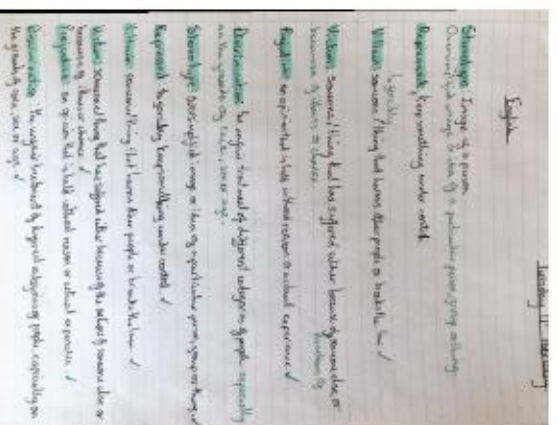
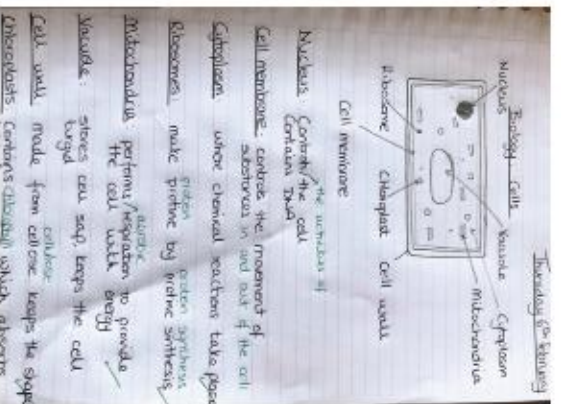
Each homework must meet the following 5 requirements:

1. Write the complete **title and date in full** eg. Tuesday 9th September 2017 on each page, **underlined**
2. You should include a **minimum of words** to summarise the topic. Do not copy the words from the text.
3. Make **full use of the page** for each topic by scaling your notes & images appropriately to use of all the space.
4. You must include **diagrams, sketches or cartoon doodles** to visually represent the topic, try to use humour.
5. **Highlight key words** and phrases, using underline, highlighter pens. Explain technical terms

HOW SHOULD I PRESENT MY WORK?

Please remember that the same rules apply to the presentation of your homework as apply for your class work: **dates and titles (which should be the name of the subject) need to be underlined with a ruler** and you should **present your work as neatly as you are able to**.

If you are self-quizzing correctly, there should be **evidence of green pen on your page**. Here are some examples of how to set out your work:



QUICK TIP

Don't forget

Always record the date, topic and page number in your Home Learning Book!

Y8 Art Portraits Autumn Term

Who is Shepard Fairey???

Portrait Keywords	
Portrait	A painting, drawing or photograph of a person
Proportion	The size relationship between different elements
Symmetry	When one side of an object mirrors another
Composition	Where you place objects on a page
Tone	The Lightness or darkness of something
Blending	A seamless transition between two colours or tones
3D	Appearing to have length, depth and width
Accuracy	The extent of which a piece of work looks like another
Control	How carefully you work with a specific media

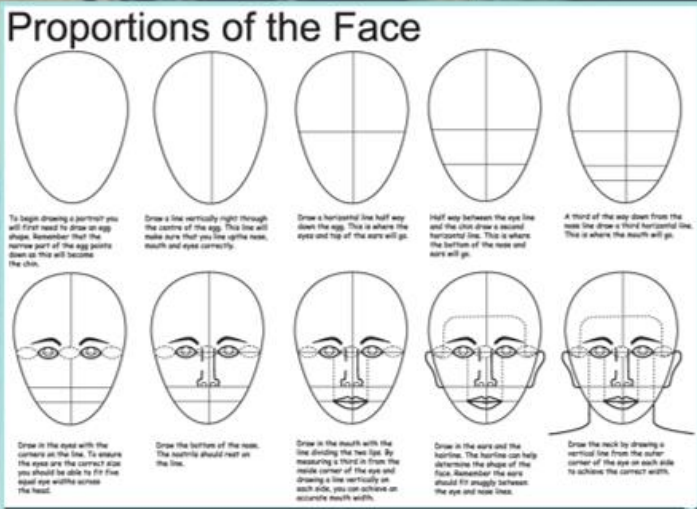
Frank Shepard Fairey is an American contemporary street artist, graphic designer, activist, illustrator, and founder of OBEY Clothing who emerged from the skateboarding scene. He first became known for his "Andre the Giant Has a Posse" sticker campaign while attending the Rhode Island School of Design

- ### Shepard Fairey Art Analysis Questions
1. What is the title of the art piece?
 2. When was it created?
 3. Who is the picture of? Why do you think Shepard Fairey chose to use them?
 4. What colours have been used? What effect does this have?
 5. What pattern have been used? What effect does it have?
 6. What technique has been used?
 7. What media has been used?
 8. How has text been used in the artwork? Does it change how the artwork is viewed?

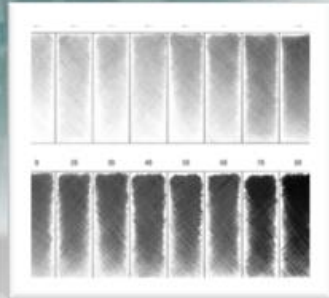
Portrait Genre
A portrait is the depiction of an individual

What am I being Assessed on????
AO1 Knowledge and Understanding of Shepard Fairey and the portrait genre
AO2 Skills in drawing portraits and using the grid method

Artist Influence
Shepard Fairey



What do you like about his work?



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WHAT AM I DOING WELL ?

WHAT DO I NEED TO DO TO IMPROVE ?

HAVE I INCLUDED ALL OF THE MAIN COMPONENTS OF A STORY IN MY PIECE ?



YEAR 8 FREE

Devising/
rehearsal
techniques

A STILL-IMAGE IS... IT HELPS US TO...
HOT SEATING IS... IT HELPS US TO...

CHORAL MOVEMENT IS... IT HELPS US TO...



A FLASHBACK IS... IT HELPS THE AUDIENCE TO...

A THOUGHT-TRACK IS... IT HELPS THE AUDIENCE TO...

Free!

A PLAY BY DAVID GRANT



WHAT ARE THE MAIN COMPONENTS OF A STORY?

EXPOSITION

Beginning of a story- where the characters and setting are introduced to the audience.

RISING ACTION

Part of the story where the main characters start to face a series of conflicts and challenges.

CLIMAX

The most intense, exciting or dramatic part of the story. This is where the characters may try to deal with the problems they face.

RESOLUTION

The characters have dealt with all of the conflicts and the story is wrapped up.

MORAL

The message your story gives people about how to behave in the real world.

DILEMMA

A situation in which a difficult choice has to be made between two or more alternatives.

SEQUENCE

A number of actions or moments put together in a specific order.

CONFLICT

A moment of disagreement or difficulty for the characters.

CLIMAX

The most intense, exciting or dramatic part of your story arc.

CONCLUSION

The final part of a story where all of the questions raised so far are answered and the conflict is resolved.

PLOT/STORY ARC

The rise and fall of the story line, made up of 4 different sections.

GESTURES

Using your hands (or sometimes eyes and head) to communicate meaning with other characters and the audience e.g. pointing/winking.

BODY LANGUAGE

Showing emotion through the way you sit, stand or position yourself.

Key words

CHARACTERISATION

Using a range of physical and vocal skills to show a character who is different to you.

STEREOTYPE

A fixed and oversimplified image of a specific type of person e.g. a strict and boring teacher or a loud and rude teenager.

CATCHPHRASE

A sentence or phrase that sums up the personality of your character.

DEVISING

Working together in a group to create scenes from scratch in response to a stimulus.

ENSEMBLE

A group of people working together on stage to create a performance.

IMPROVISTION

Action that is created on the spot.

STRUCTURE

The way a scene or play flows from one section to the next.

Task A: Write 3 diary entries or monologues from different points in the story that show how your character is developing.

Task B: Draw and label a stickman diagram of your choral movement sequence.

WHAT AM I DOING WELL ?

WHAT DO I NEED TO DO TO IMPROVE ?

WHAT CLUES ARE THERE IN THE SCRIPT THAT SHOW ME HOW TO PLAY MY CHARACTER ?

YEAR 8
THE DEMON BARBER

Rehearsal techniques

Tools to help us explore the script and better understand our character

H. S... allows the character to be interrogated about their motives and decisions.

R... O. T. W... helps us to figure out what we know about a character and what we still need to find out.

C... A... helps us to consider all of the different emotions a character might be feeling.



Returns to London seeking revenge for the loss of his wife and daughter.

A barber who was wrongly sent to Australia on a prison ship by an evil Judge.

Moves in to his old flat which is above a pork pie shop.

The pie shop is owned by Mrs Lovett who is in love with Mr Todd. They plot revenge together.

A very charming man who manipulates those around him to get what he wants.

What you need to know about
SWEENEY TODD

Key words

CHARACTERISATION

Using a range of physical and vocal skills to show a character who is different to you.

BACKGROUND

Your character's past life experiences- where they come from, their upbringing, how they have been treated.

REHEARSAL

Working together in a group to practice a part of the script and share ideas about how it should be performed.

ACCENT

The way a person speaks- can show where they are from and sometimes class or status.

TOPE

The emotion behind what your character says e.g. an angry tone, a surprised tone.

FACIAL EXPRESSION

Showing emotion through your face- eyes, mouth, eyebrows...

PACE

The speed at which your character speaks or moves.

STANCE

The way a person stands.

GAIT

The way your character walks- do they have a narrow gait or a wide gait?

POSTURE

The position in which someone holds their body when they sit or stand- can give us clues to their personality.

GESTURES

Using your hands (or sometimes eyes and head) to communicate meaning with other characters and the audience e.g. pointing/winking.

PITCH

How high or low your character's voice is.

BODY LANGUAGE

Showing emotion through the way you sit, stand or position yourself.

Task A: Research Victorian London. What was life like for ordinary people? Why might Sweeney be so angry?
Task B: Design the set for a production of The Demon Barber. Think about how you will create the trap door.




Y8 Reading Fiction/Non Fiction

Connectives you can use for comparison

Similarly...	In contrast...
Likewise...	However...
Equally...	Whereas...
In the same way...	Alternatively...
As with...	On the other hand...

Key terms:
Fiction – literature exploring imaginary events and/or people
Non fiction – based on facts and real life events e.g newspaper
Compare – state the similarities and differences between 2 texts
Summarise – state the key points of what is written
Evaluate – offer your own critical opinion


How to write about texts:

P oint	The character is presented as ... The writer makes us think that... The language of the text is used to... The structure of the text is used to... Similarly/On the other hand the writer suggests that ... The technique of...is used to... The writer shows us that... One way in which (use the key words from the question) is...	
E vidence	For example, ... One quote to show this is... In the line '.....' In the text it says '.....' This is indicated in the line '...'	Such as... For instance... This is shown in the quotation...
T echnique	This is an example of a... The technique is used to... By using the technique... Bu using ... the writer shows that...	The use of the feature is... An example of a ...
E ffect	This suggests/shows/implies/connotes/indicates... The effect on the reader is... This is used to show that... The connotations of this are...	
R elate back to the question	(Use keywords from the question) Therefore it can be seen that... Overall, the writer is... (relate back to the question and your ideas on this) Relate to why the writer wrote the text, what they are trying to convey) The author's intention was to...	

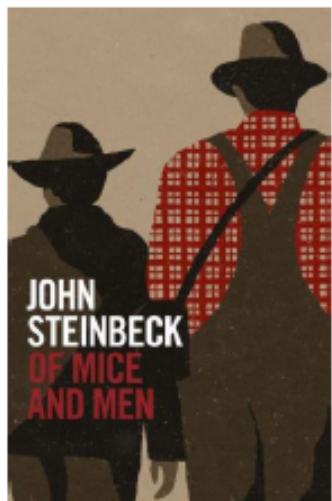
Key language devices used by writers:

adjective	word that gives more information about a noun
adverb	word that gives more information about a verb
alliteration	repetition of the same first letter
anecdote	when a writer uses an incident from his or her personal experience to make a point, or entertain the reader
comparatives	adjective that compares the quality of something
connotation	the association that a particular image / colour / word has
emotive language / imagery	language or imagery that promotes an emotional reaction
exaggeration / hyperbole	deliberately over-estimating for effect
facts	something that can be proved to be true
formal language	language used in formal situations where the speaker / writer wishes to create a good impression
informal language	language that uses colloquialisms (everyday sayings) or slang and so suits informal situations
irony	the humorous or sarcastic use of words to imply the opposite of what is being said
metaphor	a description of something as though it were something else
noun (abstract)	an abstract noun is something that you cannot touch, e.g. emotions like joy or fear
noun (concrete)	a concrete noun is something that you can touch, e.g. a table or chair
noun (proper)	Nouns that are given capitals identify particular places, things, people or events
onomatopoeia	a word that sounds like what it describes
opinion	a point of view that cannot be proved to be true or untrue
paragraph	Paragraphs are used to sequence and organise the ideas, setting, timeframe etc. of a text. The topic sentence is particularly important for signposting the main idea in the paragraph
personal pronoun	direct address to the reader, e.g. 'you'
personification	when an object is given human characteristic
perspective	A story can be told from the first, second or third person point of view (or perspective).
repetition	used to emphasise / reinforce a point
rhetorical question	a question that is asked to draw attention to a particular point, rather than a genuine request for information
sarcasm	language designed to insult or taunt
appeal to senses	language or imagery connected to hearing / smell / taste / sight / touch
sentence length	A variety of sentence lengths can be used for effect: e.g short sentences to create tension; long sentences to give detail
simile	a comparison introduced by 'like' or 'as'
superlative	adjective that expresses the highest quality or degree
triplet	using three different qualities to reinforce or stress a point
verbs	simply described as 'doing words', however many verbs identify states or feelings rather than actions and can be very emotive / effective

Year 8 English – Of Mice and Men by John Steinbeck

Key Context	Key Themes and Context	Key Quotations		
<ul style="list-style-type: none"> John Steinbeck was born in Salinas, California in 1902. Although his family was wealthy, he was interested in the lives of the farm labourers and spent time working with them. He used his experiences as material for his writing. On October 29 1929, millions of dollars were wiped out in the Wall Street Crash. It led to the People losing their life savings and a third of America's population became unemployed. A series of droughts in southern mid-western states like Kansas, Oklahoma and Texas led to failed harvests and dried-up land. Farmers were forced to move off their land: they could not repay the bank-loans which had helped buy the farms and had to sell what they owned to pay their debts. Racism/sexism were common, especially in Southern states due to economic climate, & history of slavery. 	<ol style="list-style-type: none"> Steinbeck encourages us to empathise with the plight of migrant workers during the Great Depression. The American Dream is shown to be impossible: reality defeats idealism. The novella explores the human need for companionship and the tragedy of loneliness. Steinbeck reveals the predatory nature of mankind: the powerless are targeted by the powerful. Steinbeck explores the tension between the inevitability of fate and the fragility of human dreams. Steinbeck explores the contrasts of Nature Vs Man. 	<ul style="list-style-type: none"> George – C1: "Guys like us...that work on ranches, are the loneliest guys in the world. They got no family. They don't belong no place..." Lennie – C1: "Slowly, like a terrier who doesn't want to bring a ball to its master, Lennie approached, drew back, approached again." Slim – C2: "Aint many guys travel around together, he mused. I don't know why. Maybe ever'body in the whole damn world is scared of each other." Candy – C3: "I ought to of shot that dog myself, George. I shouldn't of ought to let no stranger shoot my dog." George – C3: "We wouldn't ask nobody if we could. Jus' say, 'We'll go to her,' an' we would". Crooks – C4: "Ever'body wants a little piece of lan'. I read plenty of books out here. Nobody never gets to heaven, and nobody gets no land." Crooks – C4: "A guy needs somebody to be near him. He whined, a guy goes nuts if he aint got nobody". Curley's wife – C5: And the meanness and the plannings and the discontent and the ache fo attention were all gone from her face. She was very pretty and simple, and her face was sweet and young." Chapter 6 – A silent head and beak lanced down and plucked it out by the head, and the beak swallowed the little snake while its tail waved frantically. 	George	frustrated, devoted, a dreamer
			Lennie	childlike, unassuming, physically powerful
			Crooks	cynical, proud, isolated
			Candy	unloved, an outcast, aging
			Curley's Wife	a seductive temptress, objectified, lonely, nameless
			Curley	insecure, unmerciful, jealous
			Slim	compassionate, wise, respected
<p>Key Terminology</p> <p>Metaphor Symbolism</p> <p>Simile Foreshadowing</p> <p>Semantic Field Repetition</p> <p>Animal Imagery Protagonist</p> <p>Omniscient Narrator</p>				
				

Linking Themes and Context	Key Vocabulary	Definition	Example
<ul style="list-style-type: none"> ▪ Steinbeck encourages us to empathise with the plight of migrant workers during the Great Depression. ▪ The American Dream is shown to be impossible: reality defeats idealism. ▪ The novella explores the human need for companionship and the tragedy of loneliness. ▪ Steinbeck reveals the predatory nature of mankind: the powerless are targeted by the powerful. ▪ Steinbeck explores the tension between the inevitability of fate and the fragility of human dreams. ▪ Steinbeck explores the contrasts of Nature Vs Man. ▪ The novella is an indictment of the way society treats the dispossessed. 	Isolation	The process or fact of isolating or being isolated. (Being alone / apart from others.	Curley's wife felt a sense of isolation as her husband did not like her talking to others on the ranch.
	Loneliness	Sadness because one has no friends or company.	Curley's wife feels a sense of loneliness as she is not allowed to have friends and has no female company on the ranch.
	Racism	Prejudice, discrimination, or antagonism directed against someone based on the belief that one's own race is superior.	Crooks was subjected to racism. He believed that people didn't listen to him as he was "just a nigger talkin'."
	Segregation	The action or state of setting someone or something apart from others.	Crooks feels separated from the other workers. "I ain't wanted in the bunkhouse, and you ain't wanted in my room."
	Migrant	A person who moves from one place to another in order to find work or better living conditions.	George and Lennie are migrant workers. They move from place to place to find work. Usually, migrants would travel alone.
	Cyclical	Occurring in cycles; recurrent.	The structure of OMAM is cyclical. There is a sense of things happening in an order then repeated giving the impression that things are inevitable.
	Hierarchy	A system in which members of an organisation or society are ranked according to relative status or authority.	Curley's father is at the top of the hierarchy as he is the boss of the ranch.
	American Dream	The ideal by which equality of opportunity is available to any American, allowing the highest aspirations and goals to be achieved.	George and Lennie's dream of owning a farm and living off the "fatta the lan" symbolizes this dream.
	The Great Depression	A long and severe recession in an economy or market.	In October 1929, millions of dollars were wiped out in the Wall Street Crash. This led to the Great Depression, which crippled the country between 1930 and 1936.
	The Dust Bowl	An area of land where vegetation has been lost and soil reduced to dust and eroded, especially because of drought or unsuitable farming practice.	The dustbowl was a key reason why workers had to move so regularly due to land being dry and them not being able to farm there.



Context of Gothic Literature

The term 'gothic' comes from the Germanic tribe 'the Goths,' who played a part in the fall of the Roman Empire. The Goths are sometimes called barbarians. They destroyed a lot of Roman architecture and replaced it with buildings in the gothic style.



Medieval Europe is sometimes referred to as the 'Dark Ages' (although this can be contested for a number of reasons.) Some believe that people lived in fear due to superstition and ignorance and that not much learning took place in this time. Castles with gargoyles were built to ward off evil spirits, this architecture is known as 'Gothic' e.g. Notre Dame.

Figures from the Age of Enlightenment believed that scientific progress was the only way to advance society, and great discoveries were made in this time. They tried to rid Europe of superstition and ignorance through promoting reason and logic.

A group of poet, artists and thinkers called the Romantics challenged this because they believed that not everything can be explained by science, and too much reason rids the world of beauty and mystery.

The Gothic genre first emerged from the Romantic movement. It used art and ideas from the Dark Ages, wild emotion and nature to contrast with modern ideas about science and logic.

Gothic writing transformed into the format of the extremely popular Victorian ghost story.

Today, we use the term 'gothic' widely to describe art, style, clothing (e.g. Alexander McQueen couture) music and film (e.g. Tim Burton films). The style and genre are very much still alive.

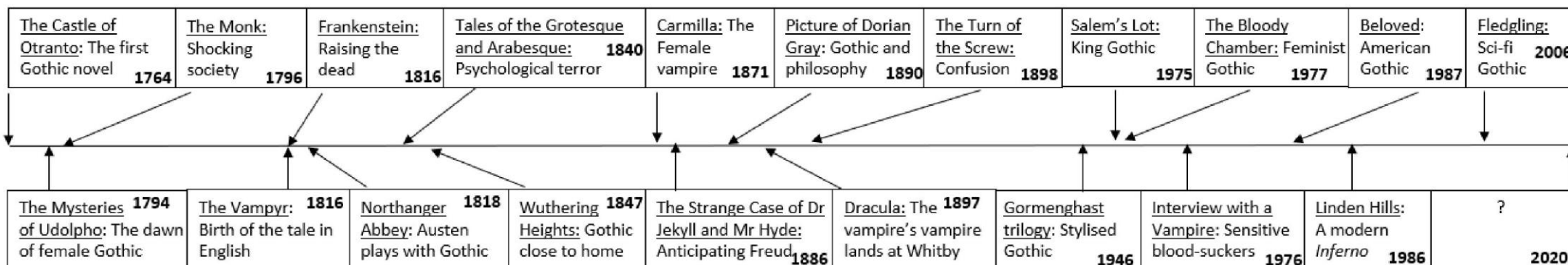
Key Themes:



- Good and evil
- Death and murder
- The Sublime
- Terror/ Horror
- Violence and cruelty
- Wild landscapes
- Isolation and loneliness
- Humanity and inhumanity
- The unknown
- Life and death
- Remote settings
- Darkness
- The Supernatural

Typical Characters

- Mysterious aristocrats (a high social status)
- Persecuted maidens or feminine characters that are threatened
- Femme fatal/ threatening women who are unnatural
- Powerful, tyrannical male villains
- Supernatural beings: vampires, ghosts, werewolves and giants



English Knowledge Organiser: Trip of a Lifetime – Writing Unit

Sentence starters:

- Try the/our...
- Visit the/our...
- Take a moment to...
- Explore the...
- Sample our...
- Experience the...

- You'll love the/our...
- You're welcome to...

- What better...?
- When did you last...?
- How about...?
- Why not...?
- Did you know...?
- Have you ever...?

- Since...
- When you...
- Before you visit...
- After you've...
- Once we've...
- Beside our...
- Outside the grounds...
- Inside your room...

- We'd recommend...
- One of the highlights...

Adjectives linked to the senses:

-  Beautiful, stunning, spectacular, splendid, tremendous, impressive, jaw-dropping, awe-inspiring, breathtaking, remarkable, astonishing, incredible, phenomenal, unbelievable, sparkling, glistening, dazzling, gleaming, shimmering, glittering
-  Soft, silky, warm, cosy, cool, soothing, calming, comforting, relaxing, uplifting
-  Tasty, delicious, delectable, delightful, succulent, luscious, juicy, moist, crispy, scrumptious, appetising, yummy, tempting, mouth-watering, tender, ice-cold
-  Melodious, mellow, musical, rhythmic
-  Aromatic, fragrant, sweet-smelling, fresh, perfumed, intoxicating



Purpose

The reason or goal that you have for writing about your topic



Audience

The specific people that you are writing for



Purpose	Definition	Examples
Persuade	the author wants you to do, buy, or believe something	advertisements, persuasive letters, opinions, campaign speeches
Describe	the author wants you to visualize or experience a person, place, or thing	product descriptions, descriptive essays, imagery

Language techniques and devices:

- Noun
- Adjective
- Comparative adjective
- Superlative adjective
- Triplet
- Alliteration
- Verb
- Imperative verb
- Adverb
- Simile
- Metaphor
- Repetition
- Onomatopoeia
- Rhyme
- Rhetorical question
- Direct address
- Preposition

Tone:

- Too friendly? Can seem unprofessional and suggest unsafe hotel.
- Too cold? Can seem unfriendly and suggest uneasy atmosphere.



Gothic Genre Word Bank






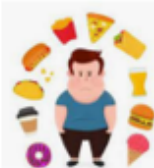


Adjectives			Nouns			
<u>People</u> Aghast Defenceless Exposed Fearful Gaunt Helpless Intimidating Looming Morose Pallid Suspicious Vulnerable	<u>Places</u> Claustrophobic Deserted Dismal Extinguished Ghostly Isolated Macabre Melancholy Obscured Ominous Secluded Shadowy	<u>Misc.</u> Alarming Ancient Antique Curious Dusty Locked Neglected Ornate Peculiar Shocking Shrouded Unusual	<u>Feelings</u> Anxiety Curiosity Despair Desperation Determination Fear Hatred Suspicion Terror Trepidation Unease Uncertainty	<u>Places</u> Alley Attic Castle Cellar Chamber Church Graveyard Staircase Street	<u>Objects</u> Candle Chest Chimney Ghost Grave Lock Raven Shadow Shroud Spectre	<u>Weather</u> Clouds Darkness Drizzle Fog Lightning Midnight Rain Storm Tempest Thunder
Verbs		Adverbs				
<u>Movement</u> Ascend Creep Descend Evade Hide Leap Lunge Peek Pursue Tiptoe Uncover	<u>Sound</u> Announce Cackle Creak Cry Gasp Howl Intone Murmur Shout Shriek Whisper	<u>Movement</u> Abruptly Cautiously Creepily Eerily Furtively Ominously Reverently Suddenly Surreptitiously Suspiciously Tentatively	<u>Sound</u> Authoritatively Continuously Creakily Endlessly Morosely Silently Soundlessly Wordlessly			

KEY METHODS/TECHNIQUES

convention	abstract nouns	theme	suspense
repetition	pathetic fallacy	tension	foreshadowing
connotations	tone	mood	atmosphere
figurative language	characterisation	setting	symbol
juxtaposition	allusion	Sensory language	Narrative voice



HT4 - Qu'est-ce que tu manges?

Normalement, au petit déjeuner je mange des céréales avec du lait		1	<i>Normally, for breakfast, I eat some cereals with some milk</i>
 Cependant hier j'ai mangé un pain au chocolat c'était délicieux !		2	<i>However yesterday I ate pain au chocolat, it was delicious!</i>
Souvent au déjeuner nous mangeons du poisson avec des légumes, à mon avis c'est bon pour la santé		3	<i>Often at lunch we eat fish with vegetables, in my opinion it is good for your health. (it is healthy)</i>
Comme dessert je prends du gâteau ou une tarte aux fraises, c'est trop bon !		4	<i>As dessert, I have some cake or a strawberry tart, it's really good</i>
 Hier soir pour le dîner nous avons mangé des plats chinois		5	<i>Yesterday evening for dinner we ate Chinese food</i>
ce que j'ai beaucoup aimé, néanmoins ce n'est pas bon pour la santé		6	<i>which I really liked, nevertheless it is not good for your health (It is unhealthy)</i>
 C'est bientôt mon anniversaire, je vais inviter tous mes amis chez McDo		7	<i>It's nearly my birthday, I am going to invite all my friends to McDonalds</i>
On mangera des burgers et des frites, après on ira au cinéma, j'ai trop hâte !		8	<i>We will eat burgers and chips, after we will go to the cinema, I can't wait!</i>

FOOD & DRINK



C. FRUIT & VEG

les fruits	fruit
les fraises	strawberries
les bananes	bananas
l'ananas	pineapple
le melon	melon
la pomme	apple
la pêche	peach
les poires	pears
les oranges	oranges
le citron	lemon
les légumes	vegetables
les oignons	onions
les haricots verts	green beans
les carottes	carrots
le concombre	cucumber
la laitue	lettuce

A. FOOD

le pain	bread
le fromage	cheese
le jambon	ham
la viande	meat
le poulet	chicken
le boeuf	beef
le porc	pork
le poisson	fish
le thon	tuna
les pommes de terre	potatoes
les frites	chips
la lait	milk
la glace	ice cream
le yaourt	yoghurt
le gâteau	cake
l'eau minérale	water
les biscuits	biscuits
les pâtes	pasta
le riz	rice

B. LES REPAS

les repas	meals
le petit déjeuner	breakfast
le déjeuner	lunch
le dîner	dinner
le café	coffee
le thé	tea
le sucre	sugar
le jus d'orange	orange juice
le vin blanc/rouge	white/red wine
les céréales	cereal
le pain grillé	toast

D. ADJECTIVES

frais/fraîche	fresh
parfait(e)	perfect
barbant(e)	boring
dégoûtant(e)	disgusting
délicieux/	delicious
épicé(e)	spicy
fort(e)	strong
cher(e)	expensive
peu varié(e)	not much choice
de mauvaise	poor quality
impoli	impolite
sale	dirty
sucré	sweet
salé	salty
propre	clean

Positive opinions

J'aime
J'aime beaucoup
J'adore
Je préfère



Negative opinions

Je n'aime pas
Je déteste

+
le/
la/
les

plus ___ que
= more ___ than
moins ___ que
= less ___ than



e.g. J'aime le poulet plus que le boeuf.
I like chicken more than beef.



SOME

de + le	du
de + la	de la
de + les	des

Je mange du
pain avec de la
confiture.



Intensifiers

Très = very
Beaucoup = a lot
Un peu = a little
Assez = quite
Trop = too

FOOD & DRINK

Qu'est-ce que vous prenez?
What are you having?

Je prends...
I'm having...

E. AU RESTAURANT/MARCHÉ	
le plat principal	main course
l'entrée	Starter
le dessert	dessert
la carte	the menu
les serveurs	the waiters
le service	the service
l'ambiance	the atmosphere
un restaurant lo-cale/chinois/indien/italien	local/Chinese/Indian/Italian restaurant
Qu'est-ce que vous voulez/désirez?	What would you like?
Et avec ça?	Anything else?
Avez-vous?	What are you having?
Donnez-moi...	Give me...
s'il vous plaît	please
Comme entrée...	As a starter...

L. KEY VERBS (PRESENT)	
Je bois	I drink
Je mange	I eat
J'aime	I like
J'adore	I love
Je préfère	I prefer
C'est	It is
Il y a	There is/are
Je voudrais	I would like
J'ai faim	I'm hungry
J'ai soif	I'm thirsty
J'ai besoin de	I need



F. LES QUANTITÉS	
un kilo de	a kilo of
cinq cent grammes de	500g of
une tasse de	a cup of
une boîte de	a tin of
un carton de	a box of
un litre de	a litre of
une bouteille de	a bottle of

Frequency Phrases
Normalement = normally
En général = in general
Tous les jours = every day

G. LA SANTÉ	
manger sainement	to eat healthily
être en bonne santé	to be in good health
surveiller mon poids	to watch my weight
un régime équilibré	a balanced diet
Ce n'est pas bon pour la santé	It's bad for your health



Connectives
Et = and
Aussi = also
De plus = Moreover
Cependant = however
Néanmoins = nevertheless

ESSENTIAL VERBS

AVOIR—TO HAVE	
J'ai	I have
Tu as	You have (s)
Il/elle a	He/she has
Nous avons	We have
Vous avez	You have (pl)
Ils/elles ont	They have

ÊTRE—TO BE	
Je suis	I am
Tu es	You are (s)
Il/elle est	He/she is
Nous sommes	We are
Vous êtes	You are (pl)
Ils/elles sont	They are



H. COMPLEX PHRASES	
Ce que j'aime le plus c'est...	What I like the most is...
Ce que j'aime le moins c'est...	What I like the least is...
Ce que je préfère c'est...	What I prefer is...

J. KEY VERBS (PAST)	
J'ai mangé	I ate
J'ai bu	I drank
J'ai pris	I had
J'ai aimé	I liked
J'ai préféré	I preferred
J'ai choisi	I chose
C'était	It was



**¡Buenos Días!**

<p>Hola, ¿Qué tal? Yo estoy muy bien. </p>	1	<i>Hello. How are you? Me, I am very good</i>
<p> Me llamo Miguel y tengo trece años.</p>	2	<i>I am called Miguel and I have thirteen years old</i>
<p>Nací el seis julio pero</p>	3	<i>I was born on the sixth July but</i>
<p>el cumpleaños de mi hermana es el doce agosto. </p>	4	<i>My sister's birthday is the 12th August.</i>
<p>Mi hermana se llama María y</p>	5	<i>My sister is called Maria and</i>
<p>tiene catorce años.</p>	6	<i>She has fourteen years old</i>
<p>Suelo llevar bien con mi hermana pero veces es muy tonta.  a</p>	7	<i>Usually I get on well with my sister but sometimes she is very silly.</i>
<p> Soy de Madrid pero vivo en Barcelona. Sin embargo</p>	8	<i>I am from Madrid but I live in Barcelona. However</i>
<p>me gustaría vivir en Santiago en Chile. </p>	9	<i>I would like to live in Santiago in Chile.</i>

MI FAMILIA



¿Tienes hermanos?
Do you have any brothers
or sisters?

✓ **Si tengo...**

✗ **No, no tengo hermanos.**

A. SIBLINGS

Tengo	I have
No tengo	I don't have
¿Tienes...?	Do you have...?
un hermano	a brother
una hermana	a sister
que se llama	who is called
que se llaman	who are called
Soy	I am
hijo único	an only child (m)
hija única	an only child (f)

B. LA FAMILIA

mi amigo	my friend (m)
mi hermanastro	my step brother
mi hermano	my brother
mi abuelo	my grandfather
mi tío	my uncle
mi padre	my father
mi hermanastra	my step sister
mi amiga	my friend (f)
mi madre	my mother
mi abuela	my grandmother
mi hermana	my sister
mi familia	my family
mi tía	my aunt
mis padres	my parents
mis abuelos	my grandparents
aquí está	Here is

C. PERSONALIDAD

Soy	I am
Eres	You are
Es	He is
Es	She is
activo/a	active
hablador(a)	chatty
gracioso/a	funny
perezoso/a	lazy
deportista	sporty
amable	nice
tímido/a	shy



Describe tu personalidad.
Describe your personality.

UPGRADE YOUR DESCRIPTIONS

y—and	totalmente—completely
pero—but	casi siempre—almost always
también—also	muy—very
siempre—always	demasiado—too
a menudo—often	bastante—quite
a veces—sometimes	normalmente—normally

D. LOS ANIMALES



un conejo	a rabbit
un perro	a dog
un gato	a cat
un pez dorado	a goldfish
una serpiente	a snake
un pájaro	a bird
un hámster	a hamster
un cobayo	a guinea pig
un ratón	a mouse
una tortuga	a tortoise
una araña	a spider
un caballo	a horse

¿Tienes mascotas?
Do you have any
pets?

✓ **Si, tengo...**

✗ **No, no tengo mascotas.**



MI FAMILIA



POSSESSIVE ADJECTIVES



This is not your pen! It is my pen!

	Masculine Singular	Feminine Singular	Plural (Masculine and Feminine)
MY	mi	mi	mis
YOUR	tu	tu	tus
HIS / HER	su	su	sus



E. EL PELO

Tengo	I have
Tienes	You have
Tiene	He/she has
el pelo	hair
el pelo castaño	brown hair
el pelo rubio	blonde hair
el pelo negro	black hair
Soy pelirrojo/a.	I have red/
el pelo corto	short hair
el pelo largo	long hair
el pelo rizado	curly hair
el pelo liso	straight hair
el pelo ondulado	wavy hair
No tengo pelo.	I don't have any hair.

¿De qué color son tus ojos y tu pelo?
What colour are your hair and eyes?

F. LOS OJOS

Tengo	I have
Tienes	You have
Tiene	He/she has
los ojos	Eyes
los ojos azules	blue eyes
los ojos verdes	green eyes
los ojos grises	grey eyes
los ojos marrones	brown eyes

ADJECTIVE AGREEMENTS

	M	F	MIP	FP
Red	rojo	roja	rojos	rojas
Yellow	amarillo	amarilla	amarillos	amarillas
Green	verde	verde	verdes	verdes
Orange	naranja	naranja	naranja	naranja
Blue	azul	azul	azules	azules
White	blanco	blanca	blancos	blancas
Black	negro	negra	negros	negras
Brown	marrón	marrón	marrones	marrones
Purple	morado	morada	morados	moradas
Pink	rosa	rosa	rosa	rosa
Grey	gris	gris	grises	grises



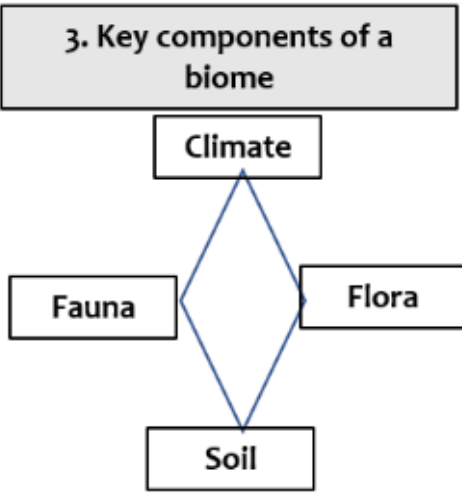
Tengo los ojos verdes.



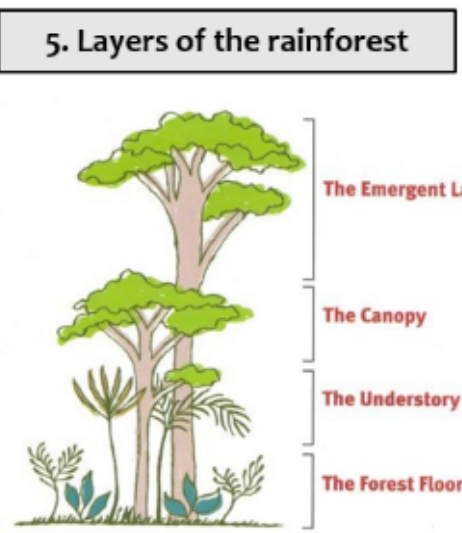
Tengo el pelo castaño y liso.

1. Biomes key words	
Biome	A large, naturally occurring major habitat
Ecosystem	A community of living organisms and their connections with climate and soil
Food chain	Links between organisms which feed on each other
Food web	A series of interconnected food chains
Decomposer	Fungi and bacteria break down dead organic matter to release nutrients
Fauna	The wildlife of a particular place
Biodiversity	The volume and variety of plants and animals within a biome
Habitat	The natural home of an organism
Deforestation	The removal of trees, often on a large scale
Ecotourism	Tourism designed to support local social and economic development whilst conserving the local environment.

2. Biomes of the world	
Tundra	Low growing plants and shrubs in cold and windy conditions
Taiga	Cone-bearing evergreen trees able to cope with cold winters
Temperate deciduous forest	Trees which lose their leaves in autumn to retain moisture during winter
Mediterranean	Shrubs, herbs and olive trees able to cope with high temperatures and summer droughts
Hot Desert	Few plants and animals in areas of extreme high temperature and low rainfall
Tropical Rainforest	Dense vegetation suited to a warm, wet climate
Tropical grassland	Area which copes with long, dry periods followed by thunderstorms.



4. Features of a food chain	
Producer	Produce energy from their environment
Primary Consumer	Get energy from producers
Secondary consumer	Get their energy from primary consumers



6. Plant and animal adaptations in tropical rainforests	
Drip Tip	Allow heavy rain to drop to lower layers
Buttress roots	Wide roots which allow trees to anchor tall trees
Epiphytes	Plants which live on branches to seek sunlight and do not need soil for nutrients
Camouflage	Blending in with the environment to avoid predators
Strong grip	Allow animals to live in the canopy to avoid predators
Nocturnal	Avoid large predators in the day

10. Opportunities in Hot Deserts	
Renewable energy production	
Mining	
Agriculture	
Tourism	

9. Features of a Hot Desert	
Found in belts 30degrees north and south of the equator	
Dominated by high pressure systems	
Hot in the day, cooler at night. Low rainfall.	
Plants have shallow roots, waxy leaves and spines or thin leaves	
Animals produce little urine, can store water effectively. Many rodents are nocturnal.	

7. Causes of deforestation	
Logging	
Mining	
Plantations	
Ranching	
Settlement	

8. Impacts of deforestation	
Loss of habitats	
Soil erosion	
CO2 emissions	

11. Importance of coral reefs	
Food and fishing	
Medicine	
Coastal protection	
Tourism	
Ecology	

12. Coral reef key words	
Coral reef	Hard, rocky ridge formed on the seabed from external skeletons of many, tiny coral animals.
Coral	Very small animals with a hard exoskeleton
Fringing reef	Form in shallow water close and parallel to the shore
Barrier reef	Starts as a fringing reef but has been surrounded by deeper water as sea levels rise pushing the coral further from the shore.
Coral atoll	Circular coral reef formed on top of an underwater volcano
Coral bleaching	Warm water forces coral to expel algae which turns the coral white and puts the coral under stress.

HALF TERM THREE – BRITAIN AND EUROPE 1901-39

1. key features

Trench warfare	System of open top interlinking tunnels used by both sides
Alliances	Formal friendships and support
Armistice	Agreement to stop fighting
Assassination	To murder someone important
Field hospital	An outside make shift hospital near the trenches
Weimar	The name of the German government after WW1.
The Nazi Party	The National Socialist German Worker's Party

2. Causes of WW1

The Alliance system	The Triple Alliance and the Triple Entente
Arms Race	Competition to build armies and Dreadnoughts
Schlieffen plan	German plan for war
Assassination	Murder of Archduke Franz Ferdinand in Sarajevo

3. Living and fighting in the trenches

Layout	Zig zag lines, fire steps, duck boards, sandbags, dugouts, bell
Food	Monotonous and boring – bully beef, tinned food, a tot of rum before going over the top.
Rats	Grew fat on the bodies of fallen soldier's dead bodies
Lice	Clothing and skin was infested with lice and fleas all the time.

4. Local history – case studies

Arnold Cenotaph	Arnot Hill Park. Names of the war dead of both World Wars.
	Personal research into different names on the cenotaph from WW1.
Arnot Hill Auxiliary hospital	Opened in 1915. Looked after TB, frostbite and soldiers recovering from surgery 20 beds soon extended to 40
	Dr Harvey Francis was Chief Medical Officer. Performed some surgery too. Had a very good reputation. Soldiers were entertained by the staff Closed in 1919.

5. Medicine in the trenches – case study

Injuries	Physical and mental. Blood loss. Gun shot wounds. Bombs. Machine guns. Tanks. Shell Shock
Surgery	Basic surgery to save life conducted in field hospitals
Gas attacks	Mustard, Chlorine and Phosgene gas all used. Gas warning bells and gas masks used. Often could see cloud of gas heading towards the trench.
Plastic surgery	Crude and time consuming with not always good results. This was a brand new type of surgery.

6. Inter war years - Germany

Weimar Germany	Poverty, hunger and depression problems solved by Gustav Stresemann who helped to create the 'Golden Years'.
Rise of the Nazis	Internal reasons – propaganda, organisation, promises to voters, Hitler, flexibility, use of technology, symbols
Wall street crash and depression	Oct 1929 stock market in the USA crashed. America recalled all German loans. Germany fell into economic depression e.g. 6m unemployed. Turned to Nazis in desperation as they offered work, bread and hope.

7. Historic environment and causation - key words

Key features	Specific factual details about something
Historic environment	The physical world – an area of interest e.g. town, site, battlefield, region
Short term cause	Something that happens shortly before an event
Long term cause	Something that happens a long time before an event
Catalyst	A trigger cause that happens immediately before an event

8. Timeline of key dates

1914	The start of World War One
1916	The Battle of the Somme
1918	The Armistice 11am 11 th November
1919	The Treaty of Versailles 28 th June
1923	The Munich Putsch 9 th November
1929	The Wall Street Crash 24 th October
1933	Adolf Hitler made Chancellor of Germany January 30 th
1939	The start of World War Two



Vocabulary

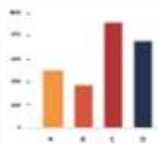
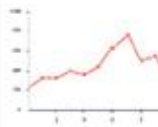

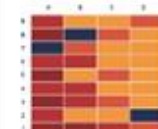
Absolute cell reference	Cell reference that does not adjust to its new location when copied or moved.
Autofill	Automatically replicates data and formulae into cells.
Autosum	A function that automatically adds the values in a range.
Break even	To not make a profit, not make a loss, but arrive at an outcome of zero.
Chart	A graphical way to show data.
Filter	Allows you to display only certain data to make it easier to find specific information in a table.
Formula	Equation that performs a calculation on values in a worksheet.
Function	A built-in formula that makes it easy for you to perform common calculations.
Goal seek	A process that automatically works out a specific required value by changing the value in a related cell.
Hide/unhide	Show or reveal selected rows or columns.
Model	a computer program that is designed to simulate what might (or what <i>did</i>) happen in a situation.
Print area	Setting the print area restricts what is going to be printed. This is important when trying to fit a large spreadsheet on to one page while printing.
Range	A group of cells on a worksheet identified by the cell in the upper left corner and the cell in the lower right corner, separated by a colon. For example, A1:B20.
Relative cell reference	Cell reference that adjusts automatically when moved or copied.
Replicate	Another word meaning "to copy", especially for formulae.
Sort	Arranging the contents of a range in ascending (A to Z) or descending (Z to A) order.
Spreadsheet	A grid of rows and columns containing numbers, text, and formulas. Used to solve number-based problems.
What if...? questions	Types of questions that explore different possible events or situations.
Worksheet	The workspace where you enter data.

Spreadsheet Functions

AVERAGE	Shows the average of values in a range	=SUM	Adds up the total value of the cells in a range
MAX	Displays the biggest value from the range	=MIN	Displays the smallest value from the range
IF	A logical function that can be helpful in decision-making. It tests to see if a condition is true or false, e.g. =IF(A1>75,"Pass","Fail") If the value in cell A1 is greater than 75, it will display Pass . If it is not, it will display Fail . Text strings must be inside quotation marks.		
COUNTIF	A logical function that counts the cells within a range that meet criteria you specify, e.g. =COUNTIF(A1:A25,"apples") This will show the number of cells from the range A1:A25 that contain the word apples .		
AVERAGEIF	A logical function that displays the average of values in cells within a range that meet criteria you specify, e.g. =AVERAGEIF(B5:B30,"male",D5:D30) This will show the average value from the cells in column D that are on the same row as a cell in column B that contains the word male .		
=SUMIF	A logical function that displays the sum total of values in cells within a range that meet criteria you specify, e.g. =SUMIF(D2:D20,"Toyota",E2:E20) This will add up and display the total values from column E that are on the same row as the cells in column D containing the word Toyota .		
Numerical operators			
>	greater than	<	less than
>=	greater than or equal to	<=	less than or equal to
=	equal to	<>	not equal to
Goalseek	A process that automatically works out a required value by changing the value in a related cell. In the example to the left, we are setting the value of B26 to 500 by changing cell A26. This can be very useful when working on an incomplete model.		



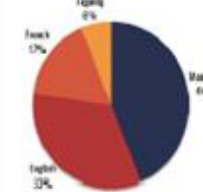
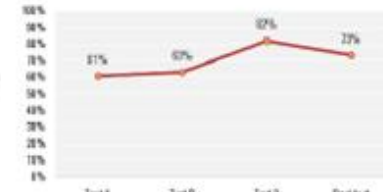
Representing Data Graphically

	Bar charts are used to compare variables . They can appear vertically (also called a column chart) or horizontally.
	Line graphs are used to show trends over time .
	Pie charts are used to show the components of a larger whole .
	Conditional formatting applies formatting to a range based on the contents of the cells. A common approach is a heat map like the example to the left.

Key components of a chart

Title	No chart is complete without a descriptive title. Think carefully when naming a chart.
Axes	The horizontal and vertical axes of your chart should be labelled and use appropriate units.
Series	The name given to a row or column of numbers plotted in a chart.
Data labels	It is essential that data displayed graphically is well-labelled to enable the viewer to understand the data being presented.

Examples

LANGUAGES SPOKEN AT HOME	CLASS AVERAGE SCORE
	

Knowledge Organiser- ICT



Asset Table:

Create an asset table to show the range of images, assets and information you have collected for the project – listing where you got it from and describing any legal issues.

Planning:

Create a work plan which lists all of the tasks involved in the whole project. Estimate how long each task will take and create a chart or diary to record how long they REALLY take to complete. Build in some contingency time in case things go wrong! Explain why you had to use it if things don't go according to plan all the time.

Why are digital graphics used?

- To entertain
- To inform
- To advertise
- To promote
- To educate

Visualisation:

A visualisation is a sketch or diagram of what you think the final graphic might look like.

What can you change about an image to make it more suitable for different uses?

- Size in Pixels
- Resolution (Dpi)
- Quality
- Compression

Target Audience:

You need to know your target audience. Who are they? What kind of things do they do? What are their likes and dislikes? What are they interested in? Getting an understanding of these individuals helps you create with ease and make something you know will relate to them.

Terminology

Purpose	The reason for which a graphic is made or created.
Properties	An attribute, quality or characteristic of a graphic.
Plan	A detailed proposal for doing or achieving something.
Create	To make or produce something.
Review	A formal assessment of something. Think strengths, weaknesses and improvements
Annotate	A note by way of explanation or comment added to a text or diagram

Tools and Techniques:

You need to show evidence of the tools and techniques you have used:

- Cropping/Magic wand tool
- Rotating
- Blur/smudge tool
- Eraser tool
- Transparency
- Changing brightness/contrast/color adjustment
- Gradient/fill tools

Uses Terms

Advertises
Inform
Educate
Entertain
Promote
Publishing
Presentation

Audience Terms

Age
Location
Gender
Ethnicity
Accessibility
Income
Requirements



Technical Compatibility

Your final image must meet the technical specification set by the client.

Correct size in Pixels and Correct Resolution.

In Fireworks – File>Export>Adjust the size and resolution to fit the client brief.

Client Requirements:

Your client is the person you will be working for. They will tell you what to plan, design or create for them. The client will set out requirements that they want you to follow when you plan the project.

What type of file formats do digital graphics use?

- .tiff
- .jpg
- .png
- .bmp
- .gif
- .pdf

You will need to find out the different uses and properties of these file formats and be able to describe why different formats are suitable for different situations

Export Options:

Digital Graphics need to be saved in different formats for different purposes – the size and resolution will be different for:

- Print use
- Websites
- Multimedia

Which resources will be needed to make your digital graphic?

- Digital Camera
- Internet
- Computer System
- Adobe Fireworks
- Adobe Photoshop
- Scanner

Where are digital graphics used?

- Magazine covers
- CD/DVD covers
- Adverts
- Websites
- Games
- Multimedia products

Year 8 Mathematics

Term 1A: Multiplying and Dividing



What do I need to be able to do?

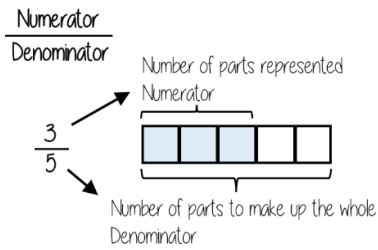
By the end of this unit you should be able to:

1. Carry out any multiplication or division using fractions and integers
2. Model solutions in different representations

Keywords

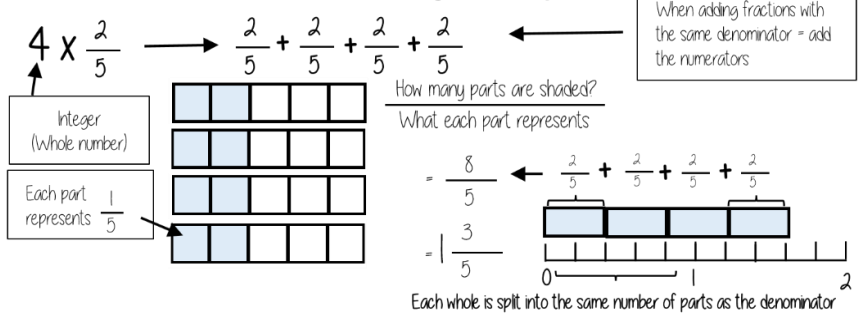
- Numerator:** the number above the line on a fraction. The top number. Represents how many parts are taken
- Denominator:** the number below the line on a fraction. The number represent the total number of parts.
- Whole:** a positive number including zero without any decimal or fractional parts.
- Commutative:** an operation is commutative if changing the order does not change the result.
- Unit Fraction:** a fraction where the numerator is one and denominator a positive integer.
- Non-unit Fraction:** a fraction where the numerator is larger than one.
- Dividend:** the amount you want to divide up.
- Divisor:** the number that divides another number.
- Quotient:** the answer after we divide one number by another. e.g. dividend ÷ divisor = quotient
- Reciprocal:** a pair of numbers that multiply together to give 1.

Representing a fraction



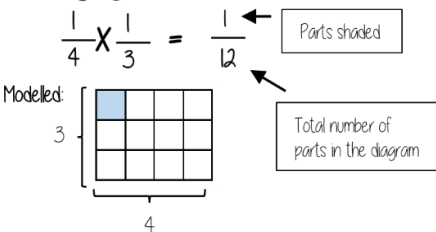
ALL PARTS of a fraction are of equal size

Repeated addition = multiplication by an integer

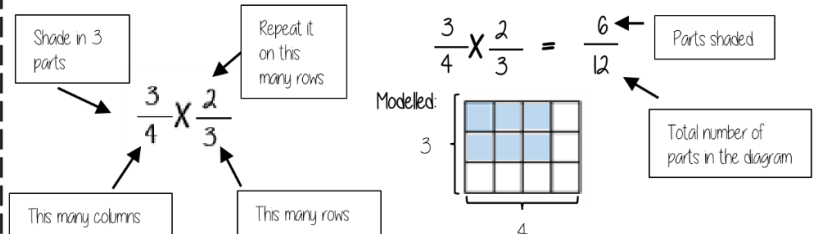


Revisit
When adding fractions with the same denominator = add the numerators

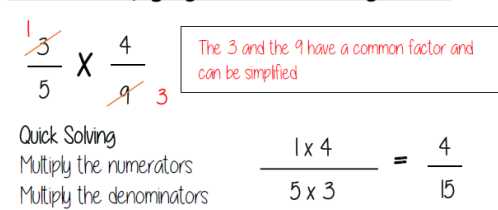
Multiplying unit fractions



Multiplying non-unit fractions

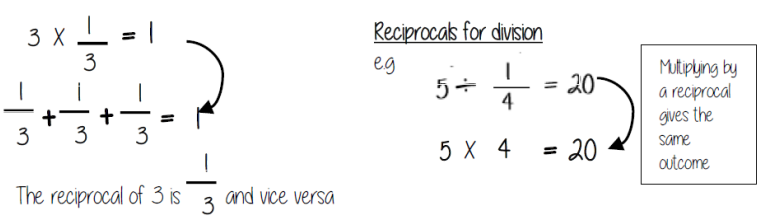


Quick Multiplying and Cancelling down

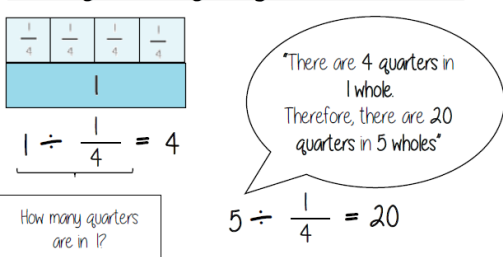


The reciprocal

When you multiply a number by its reciprocal the answer is always 1

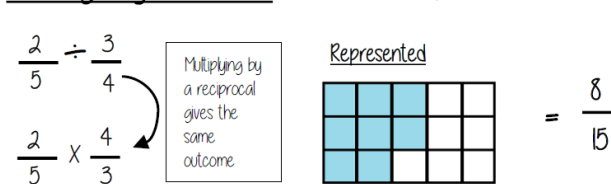


Dividing an integer by a unit fraction



Dividing any fractions

Remember to use reciprocals



Year 8 Mathematics

Term 1B: Working with Fractions



What do I need to be able to do?

By the end of this unit you should be able to:

- Find a fraction of a given amount
- Use a given fraction to find the whole or other fractions
- Find a fractional increase/decrease
- Multiply and divide mixed numbers together, both positive and negative

Keywords

- Fraction:** how many parts of a whole we have
- Equivalent:** of equal value
- Whole:** a number with no fractional or decimal part.
- Percentage:** parts per 100 (uses the % symbol)
- Place Value:** the value of a digit depending on its place in a number. In our decimal number system, each place is 10 times bigger than the place to its right
- Convert:** change into an equivalent representation, often fraction to decimal to a percentage cycle.

Fraction of a given amount

Find $\frac{2}{5}$ of £205

The bar represents the whole amount

£205

£41

2 out of the 5 equal parts
 $2 \times £41 = £82$

$£205 \div 5 = £41$

Each part of the bar model represents £41

90

30

15

Use bar models for comparisons

$\frac{1}{3}$ of 90 = 30

$\frac{2}{3}$ of 45 = 30

$\therefore \frac{1}{3}$ of 90 = $\frac{2}{3}$ of 45

Use a fraction of amount

$\frac{2}{3}$ of a value is 70. What is the whole number?

$70 \div 2 = 35$

Each part of the bar model represents 35

70

35

$35 \times 3 = 105$

The whole number is 105

The wording of the question is important to setting up the bar model

$\frac{3}{4}$ of a number is 63

What is $\frac{1}{6}$ of the number?

63

21

Find the whole

84

Use the whole to find a given part

-14

Fractional increase

Increase 120kg by $\frac{1}{4}$

120kg

30

$\frac{1}{4}$

$120 \div 4 = 30$
 $120 + 30 = 150$

Therefore 120kg increased by $\frac{1}{4}$ is 150kg

Find one part first by splitting 120kg into 4 parts. You then know each part is worth 30kg. You then need to add an extra part because you are increasing (remember each part is now worth 30kg)

Fractional decrease

Decrease 120kg by $\frac{1}{4}$

120kg

30

For decreases you follow the same process but remove one part. So here you are left with 90kg.

Multiplying and dividing mixed numbers by fractions

Calculate:

$2\frac{2}{3} \times \frac{1}{4}$ Convert all fractions to improper fractions where possible

$\frac{8}{3} \times \frac{1}{4}$ Carry out the multiplication of fractions as usual

$\frac{8}{12} = \frac{2}{3}$ Simplify your answer

You can do the same process for division:

$2\frac{2}{3} \div \frac{1}{4} = \frac{8}{3} \div \frac{1}{4} = \frac{8}{3} \times \frac{4}{1}$ Check back at the dividing fractions section

Do not forget to simplify!

$= \frac{32}{3}$

$= 10\frac{2}{3}$

Year 8 Mathematics

Term 1C: Fractions, Decimals and Percentages



What do I need to be able to do?

By the end of this unit you should be able to:

- Convert fluently between fractions, decimals and percentages (FDP)

Keywords

Percent: parts per 100 – written using the % symbol

Decimal: a number in our base 10 number system. Numbers to the right of the decimal place are called decimals

Fraction: a fraction represents how many parts of a whole value you have

Place value: the numerical value of a digit decided by its position in the number

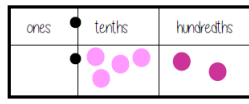
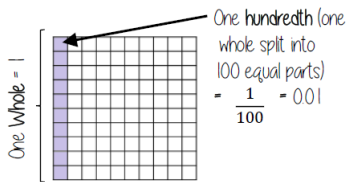
Interval: a range between two numbers

Tenth: one whole split into 10 equal parts

Hundredth: one whole split into 100 equal parts

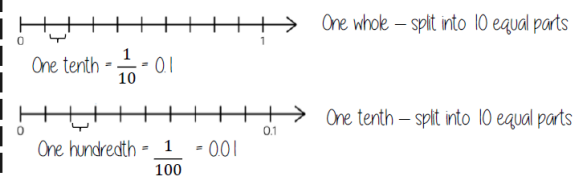
Recurring: a decimal that repeats in a given pattern

Tenths and hundredths

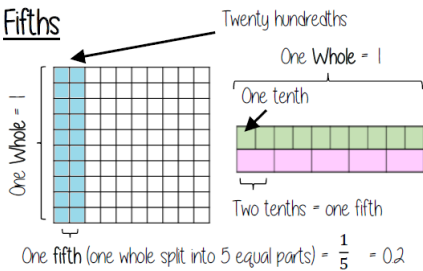


0 ones, 5 tenths and 2 hundredths
 $0 + 0.1 + 0.1 + 0.1 + 0.1 + 0.1 + 0.01 + 0.01$
 $= 0 + 0.5 + 0.02$
 $= 0.52$

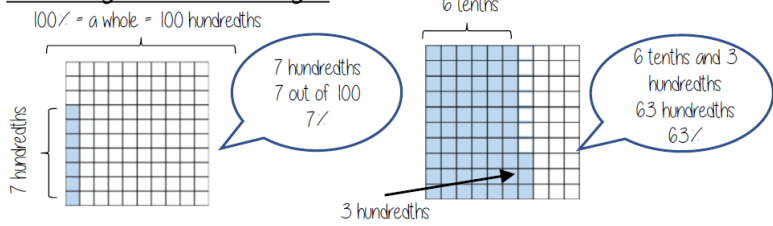
On a number line



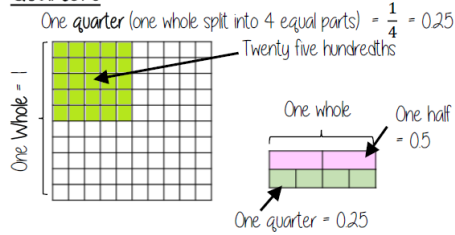
Fifths



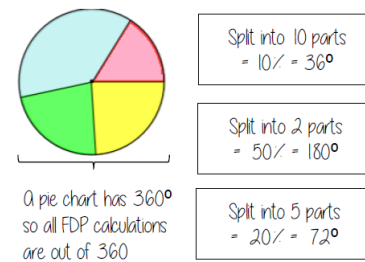
Percentages on a hundred grid



Quarters

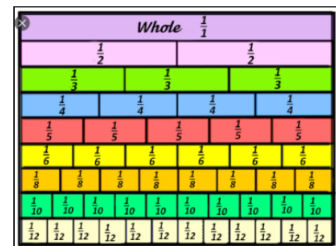


Simple pie charts

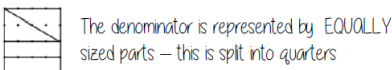


Equivalent fractions

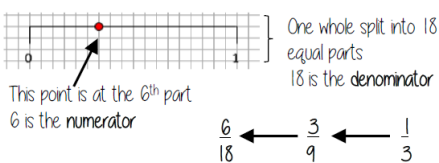
Represent equivalence with fraction walls



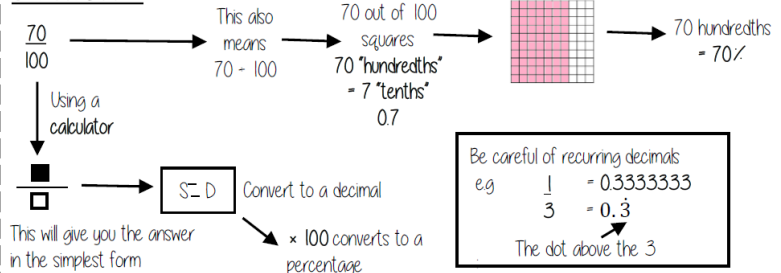
Fractions – on a diagram



Fractions – on a number line



Convert FDP



Year 8 Mathematics

Term 1D: Percentages



What do I need to be able to do?

- By the end of this unit you should be able to:
- Convert between FDP less than and more than 100
 - Increase and decrease using multipliers
 - Express an amount as a percentage
 - Find percentage change

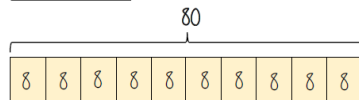
Keywords

- Percent:** parts per 100 – written using the % symbol
- Decimal:** a number in our base 10 number system. Numbers to the right of the decimal place are called decimals
- Fraction:** a fraction represents how many parts of a whole value you have
- Equivalent:** of equal value
- Reduce:** to make smaller in value
- Growth:** to increase/to grow
- Integer:** whole number, can be positive, negative or zero
- Invest:** use money with the goal of it increasing in value over time (usually in a bank)

Find the percentage of an amount (Mental methods)

$10\% = \frac{1}{10}$ of the whole $50\% = \frac{5}{10} = \frac{1}{2}$ of the whole
 $20\% = \frac{2}{10} = \frac{1}{5}$ of the whole $5\% = \frac{1}{20}$ of the whole

Find 65% of 80



Method 1

$$65\% = 10\% \times 6 + 5\%$$

$$= (8 \times 6) + 4$$

$$= 52$$

Method 2

$$65\% = 50\% + 10\% + 5\%$$

$$= 40 + 8 + 4$$

$$= 52$$

Find the percentage of an amount (calculator methods)



Using a multiplier

Find 65% of 80

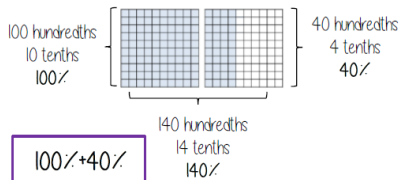
Fraction, decimal, percentage conversion

$$65\% = \frac{65}{100} = 0.65$$

← The multiplier

$$0.65 \times 80 = 52$$

Convert FDP < and > 100%

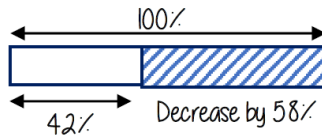


$$100\% + 40\%$$

$$= 1 + 0.40$$

$$= 1.40$$

Percentage decrease: Multipliers

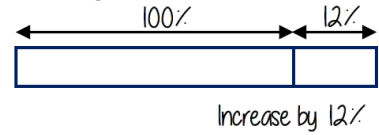


$$100\% - 58\% = 42\%$$

$$100 - 0.58 = 0.42$$

← Multiplier Less than 1

Percentage increase: Multipliers

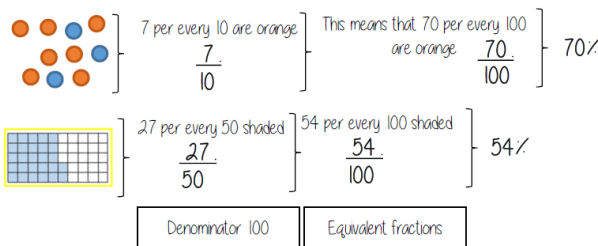


$$100\% + 12\% = 112\%$$

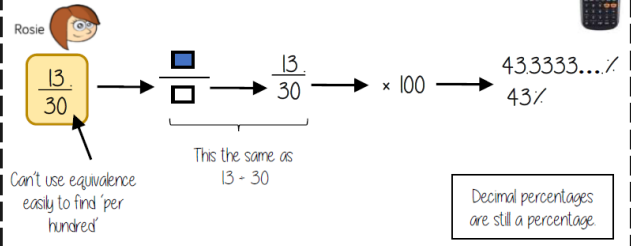
$$100 + 0.12 = 1.12$$

← Multiplier More than 1

Express as a % - Non-calculator Percent – per hundred

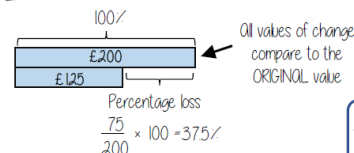


Express as a % - Calculator



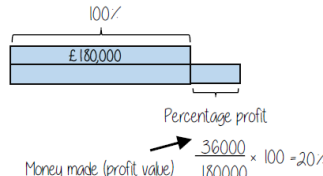
Percentage change

I bought a phone for £200. A year later sold it for £125.



$$\frac{\text{Difference in value}}{\text{Original value}} \times 100$$

I bought a house for £180,000, I later sold it for £216,000.



Choose appropriate method

The language and wording of the question is the key.

Have you represented the question in a bar model?
Can you use a calculator?

Year 8 Mathematics

Term 2A: Brackets, Equations and Inequalities



What do I need to be able to do?

By the end of this unit you should be able to:

- Form Expressions
- Expand and solve equations
- Solve equations with brackets
- Represent inequalities
- Form and solve inequalities

Keywords

- Simplify:** grouping and combining similar terms
- Substitute:** replace a variable with a numerical value
- Equivalent:** something of equal value
- Coefficient:** a number used to multiply a variable
- Product:** multiply terms
- Highest Common Factor (HCF):** the biggest factor (or number that multiplies to give a term)
- Inequality:** an inequality compares two values showing if one is greater than, less than or equal to another

Form expressions

For unknown variables, a letter is normally used in its place


More than – ADD

Less than/ difference – SUBTRACT

e.g 4 more than t $\longrightarrow t + 4$
 8 less than k $\longrightarrow k - 8$

Only similar terms can be grouped together

e.g Find the perimeter of this shape
 (Perimeter = length around outside of shape)

t  $t + 2t + 1 + t + 2t + 1 \longrightarrow 6t + 2$

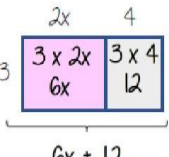
Directed numbers

$++ \longrightarrow +$
 $-- \longrightarrow +$
 $+- \longrightarrow -$
 $-+ \longrightarrow -$

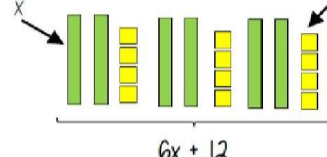
e.g $a = -5$ and $b = 2$
 $a^2 = a \times a = -5 \times -5 = 25$
 $b + a = 2 + -5 = -3$

Multiply single brackets

$3(2x + 4)$



$6x + 12$

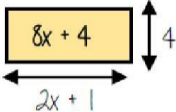


$6x + 12$

Different representations of $3(2x+4) = 6x + 12$

Factorise into a single bracket

$8x + 4$



Try and make this the highest common factor

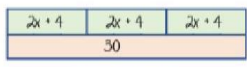
The two values multiply together (also the area) of the rectangle

$8x + 4 \equiv 4(2x + 1)$


Note:
 $8x + 4 \equiv 2(4x + 2)$
 This is factorised but the HCF has not been used

Solve equations with brackets


$3(2x + 4) = 30$



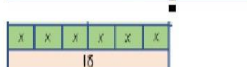
30



30



30



18

$3(2x + 4) = 30$

Expand the brackets

$6x + 12 = 30$

-12 -12

$6x = 18$

-6 -6

$x = 3$

Substitute to check your answer. This could be negative or a fraction or decimal.

Simple Inequalities

- $<$ less than
- \leq Less than or equal to
- $>$ More than
- \geq More than or equal to

$x < 10$
 Say this out loud
 "x is a value less than 10"

$10 > x$
 Say this out loud
 "10 is more than the value"

Note:
 $x < 10$ and $10 > x$
 represent the same values

$x + 2 \leq 20$
 "my value + 2 is less than or equal to 20"
 $x \leq 18$
 The biggest the value can be is 18

Form and solve inequalities

Two more than treble my number is greater than 11

Find the possible range of values

Form $x \longrightarrow x \times 3 \longrightarrow +2 \longrightarrow 11$

Solve $x \longleftarrow -3 \longleftarrow -2 \longleftarrow 11$

Check $x > 3$

This would suggest any value bigger than 3 satisfies the statement
 $3 \times 3 + 2 = 11 \checkmark$ $10 \times 3 + 2 = 32 \checkmark$

Algebraic constructs

- Expression**
 A sentence with a minimum of two numbers and one maths operation
- Equation**
 A statement that two things are equal
- Term**
 A single number or variable
- Identity**
 An equation where both sides have variables that cause the same answer includes \equiv
- Formula**
 A rule written with all mathematical symbols e.g area of a rectangle $A = b \times h$

Year 8 Mathematics

Term 2B: Indices



What do I need to be able to do?

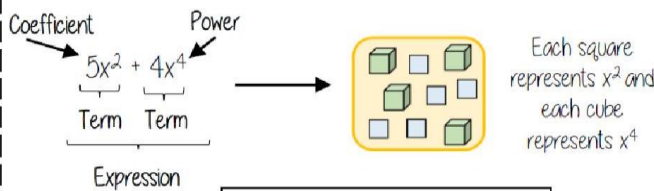
By the end of this unit you should be able to:

- Add/subtract expressions with indices
- Multiply expressions with indices
- Divide expressions with indices
- Know the addition law for indices
- Know the subtraction law for indices

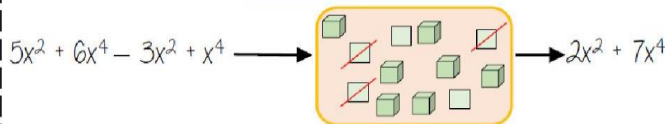
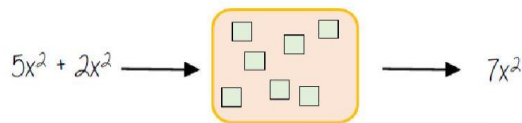
Keywords

- Base:** The number that gets the power acts upon
- Power:** The exponent – or the number that tells you how many times to use the number in multiplication
- Exponent:** The power – or the number that tells you how many times to use the number in multiplication
- Indices:** The power or the exponent
- Coefficient:** the number used to multiply the variable
- Simplify:** to reduce its power to its lowest terms
- Product:** multiply

Addition/ Subtraction with indices



Only similar terms can be simplified
If they have different powers, they are unlike terms



Multiply expressions with indices

$$4b \times 3a$$

$$\equiv 4 \times b \times 3 \times a$$

$$\equiv 4 \times 3 \times b \times a$$

$$\equiv 12 ab$$

$$5t \times 9t$$

$$\equiv 5 \times t \times 9 \times t$$

$$\equiv 5 \times 9 \times t \times t$$

$$\equiv 45 t^2$$

$$2b^4 \times 3b^2$$

$$\equiv 2 \times b \times b \times b \times b \times 3 \times b \times b$$

$$\equiv 2 \times 3 \times b \times b \times b \times b \times b \times b$$

$$\equiv 6 b^6$$

There are often misconceptions with this calculation but break down the powers

Addition/ Subtraction laws for indices

$$3^5 \times 3^2 \longrightarrow 3^7$$

$$= (3 \times 3 \times 3 \times 3 \times 3) \times (3 \times 3)$$

The base number is all the same so the terms can be simplified

Addition law for indices

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

$$3^5 \div 3^2 \longrightarrow 3^3$$

$$\frac{3 \times 3 \times 3 \times \cancel{3} \times \cancel{3}}{\cancel{3} \times \cancel{3}} \longrightarrow \frac{3^3}{3^0} \longrightarrow \frac{3^3}{1}$$

Subtraction law for indices

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

Divide expressions with indices

$$\frac{24}{36} \longrightarrow \frac{\cancel{2} \times \cancel{2} \times 2 \times \cancel{3}}{\cancel{2} \times \cancel{3} \times 2 \times \cancel{3}} \longrightarrow \frac{2}{3}$$

$$\frac{5a^3b^2}{15ab^6} \longrightarrow \frac{\cancel{5} \times \cancel{a} \times \cancel{a} \times \cancel{a} \times \cancel{b} \times \cancel{b}}{3 \times \cancel{5} \times \cancel{a} \times \cancel{b} \times \cancel{b} \times \cancel{b} \times \cancel{b} \times \cancel{b} \times \cancel{b}} \longrightarrow \frac{a^2}{3b^4}$$

Cross cancelling factors shows cancels the expression

$$\frac{23 a^7 y^2}{5 d b^6}$$

This expression cannot be divided (cancelled down) because there are no common factors or similar terms



What do I need to be able to do?

By the end of this unit you should be able to:

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

Keywords

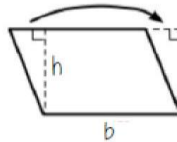
- Congruent:** The same
- Area:** Space inside a 2D object
- Perimeter:** Length around the outside of a 2D object
- Pi (π):** The ratio of a circle's circumference to its diameter
- Perpendicular:** At an angle of 90° to a given surface
- Formula:** A mathematical relationship/rule given in symbols. E.g. $b \times h = \text{area of a rectangle}$
- Infinity (∞):** A number without a given ending (too great to count to the end of the number) – never ends
- Sector:** A part of the circle enclosed by two radii and an arc

Area – rectangles, triangles, parallelograms

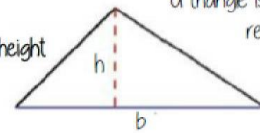
Rectangle
Base x Height



Parallelogram/ Rhombus
Base x Perpendicular height



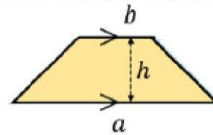
Triangle
 $\frac{1}{2} \times \text{Base} \times \text{Perpendicular height}$



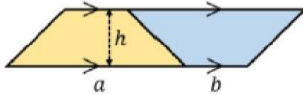
A triangle is half the size of the rectangle it would fit in

Area of a trapezium

$$\frac{\text{Area of a trapezium}}{2} = \frac{(a+b) \times h}{2}$$



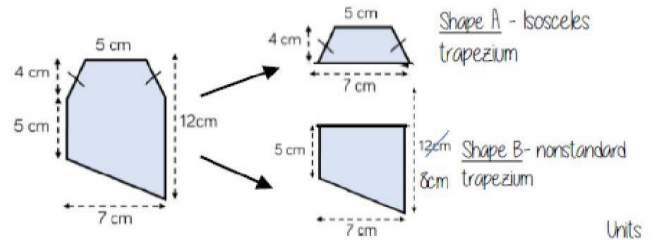
Why?



- Two congruent trapeziums make a parallelogram
- New length $(a + b) \times \text{height}$
- Divide by 2 to find area of one

Compound shapes

To find the area compound shapes often need splitting into more manageable shapes first. Identify the shapes and missing sides etc. first.



$$\text{Shape A} + \text{Shape B} = \text{total area}$$

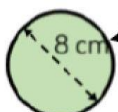
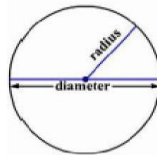
$$\frac{(5+7) \times 4}{2} + \frac{(5+8) \times 7}{2} = 24 + 45.5 = 69.5 \text{ cm}^2$$

Units

Area of a circle (Non-Calculator)

Read the question – leave in terms of π or if $\pi \approx 3$ (provides an estimate for answers)

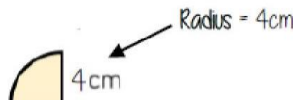
Area of a circle
 $\pi \times \text{radius}^2$



Diameter = 8cm
 \therefore Radius = 4cm

$$\begin{aligned} \pi \times \text{radius}^2 &= \pi \times 4^2 \\ &= \pi \times 16 \\ &= 16\pi \text{ cm}^2 \end{aligned}$$

Find the area of one quarter of the circle



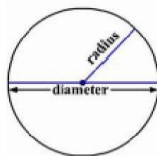
Circle Area = $16\pi \text{ cm}^2$
Quarter = $4\pi \text{ cm}^2$

Area of a circle (Calculator)



SHIFT $\times 10^{-1}$

Area of a circle
 $\pi \times \text{radius}^2$



How to get π symbol on the calculator

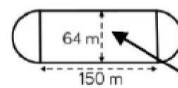
It is important to round your answer suitably – to significant figures or decimal places. This will give you a decimal solution that will go on forever!

Compound shapes including circles

Circumference
 $\pi \times \text{diameter}$

Compound shapes are not always area questions
For Perimeter you will need to use the circumference

Spotting diameters and radii



This dimension is also the diameter of the semi circles.

$$\begin{aligned} \text{Arc lengths} &= \pi \times 64 \\ &= 64\pi \end{aligned}$$

Don't need to halve this because there are 2 ends which make the whole circle

Arc lengths + Straight lengths = total perimeter

$$\begin{aligned} &= 64\pi + 150 + 150 \\ &= (300 + 64\pi) \text{ m} \\ \text{OR} &= 501.1 \text{ m} \end{aligned}$$

Still remember to split up the compound shape into smaller more manageable individual shapes first

Musical knowledge 1: the essentials

Layers of sound

Melody = tune. One note at a time. Can be sung or played on an instrument.

1. Melody



See opposite

2. Chords

Bass line = the lowest part. One note at a time.

3. A bass line

Played on a low-pitched instrument such as bass guitar, cello, double bass, tuba.



4. A beat



Beat = rhythm. Played on unpitched instruments such as drums.

Notes on a keyboard

- Notes are in alphabetical order, going up to G
- Say: 'C is to the left of the two black keys: C D E F G A B'



A note by itself CANNOT be major or minor!

- Every black note has two names: sharp # and flat b
- Flat = lower than white note
- Sharp = higher than white note



Musical knowledge 2: rhythm notation

Definitions

1. Pulse = the underlying count in the music. Like a heartbeat. You clap/dance to this. You *feel* it rather than *hear* it.



2. Rhythm = long and short notes, and the gaps between them:

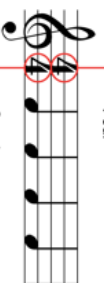


Bars and time signatures

- Notes on the staff are divided up into bars by bar lines.



2. The time signature = two numbers at the start of the music. It tells us how many beats are in a bar: how we count in the piece.



3. The top number tells us how many beats are in a bar. The bottom number tells us what sort of beats they are.

Chords

- Chord = 2+ notes played together



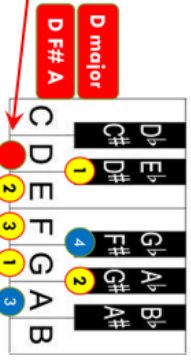
- Chords can be major or minor

Major = 4 then 3 semitones. Sounds happy

Minor = 3 then 4 semitones. Sounds sad

Semitone = the next note, counting white AND black

The bottom note of the chord = the root. The root gives its name to the chord.



- Chords are usually played on the keyboard, guitar, or ukulele.

Where we put our finger (2nd fret)

Left hand side of chord diagram = string nearest your chin

Strings

Frets

Am Chord Name: A minor (if there is no 'm' in the chord name, it is major)

How to read rhythms

- These are the basic types of notes. American note names are more logical: here, the UK names are in brackets.

Note/Rest Name	Note Symbol	Rest Symbol	Note/Rest Value (Length)
Whole Note/Rest (Semibreve)	○	—	4 beats
Half Note/Rest (Minim)	∩	—	2 beats
Quarter Note/Rest (Crotchet)	∩	∩	1 beat
Eighth Note/Rest (Quaver)	∩	∩	1/2 beat

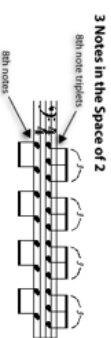
Pairs or 4s of quavers are beamed together. Remember each blob is a note.

- Rhythms can be made up of any combination of notes or rests, as long as each bar adds up correctly.

- A dot after a note adds on half as much again:
 - $\text{♩} \cdot = \text{♩} + \text{♩} = 3 \text{ beats}$

$$\text{♩} = \text{♩} + \text{♩} = 1\frac{1}{2} \text{ beats}$$

- A triplet squeezes three notes into the time it normally takes to play two:



Musical knowledge 3: pitch notation

Definitions

- Rhythm** = long and short notes, and the gaps between them:
 -
 -
- Melody** = tune. This has **pitch** as well as rhythm (i.e. it goes up and down):
 -
 -

Words for describing melodies

Treble Clef

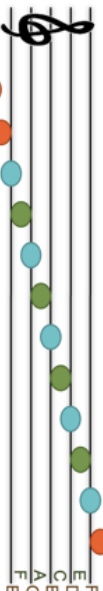


MELODY

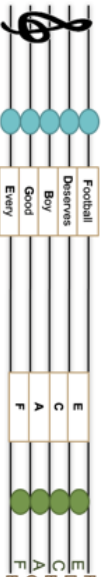
Register - how **high or low** the notes are
Range - the distance from the lowest note to the highest: **wide or narrow**
Sequence - a pattern that repeats, **ascending or descending**
Scale (moving in a scale) or **broken chord** (moving in chord shapes)
movement
Steps (going to a **next-door note**) or **leaps** (**jumping** to a note further away)
Ornaments (extra notes added to **decorate**)
Melodic ostinato/riff: a **repeating pattern**

How to read pitches

- The blobs of the notes are arranged on the lines and spaces of the staff. The higher the blob on the staff, the higher the pitch.



- Notes alternate being on a line and in a space.
- Notes higher or lower than the staff have their own little line called a **ledger line**, like middle C shown above.



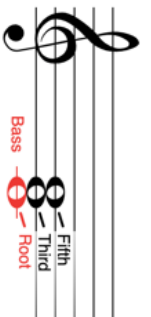
- You can remember the notes on the lines with '**Every Good Boy Deserves Football**', and the notes in the spaces spell '**FACE**'. Remember to go **upwards** when doing this!

Musical knowledge 4: a cappella

Definitions and theory

- A cappella** = music sung by voices alone: no instruments
- Key** = the set of notes used to create the music. Can be **major** (sounds happy) or **minor** (sounds sad)
- Inversion** = when you shuffle the order of the chord notes:

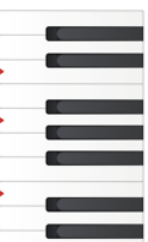
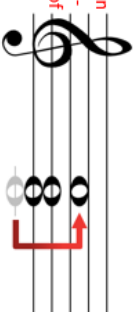
Root position chords follow the 4+3 or 3+4 pattern.



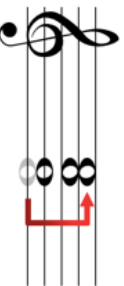
C major chord in **root position** (called this because the root note is in the bass (at the bottom))



C major chord in **first inversion** - now the **third** of the chord is in the bass.



C major chord in **second inversion** - now the **fifth** of the chord is in the bass.



These are all C major chords because they have C E and G in them.

Types of voices

- Soprano** = the highest female voice
- Treble** = a boy's unchanged voice
- Alto** = a lower female voice
- Tenor** = a high male voice
- Bass** = a low male voice

Articulation

Articulation is *how* the notes are played/sung.

ARTICULATION

Strummed - on a guitar or ukulele, playing **all the notes of a chord**
Finger-picking - on guitar or uke, playing individual notes **one at a time**
Sustained - notes that are **held on**
Stab - a **short, accented chord**
Staccato - **short, detached notes**
Legato - notes that join **smoothly** together
Surred - on a voice/wind instrument, going from one pitch to another **without articulating** the new note
Pizzicato - on a violin or cello, **plucking** the string
Arco - on a violin or cello, using the **bow**
Accents - notes that are **louder** than the surrounding notes

Musical Knowledge : Composing

Composing Using the Elements

- Texture:** how layers of sound within a piece of music interact.
- Dynamics:** How loud or soft a musical sound is.
- Rhythm:** Musical patterns, measured in time e.g. 4 beats in every bar is common time.
- Instrumentation:** The instruments and musical sections used in a composition e.g. strings, percussion etc.
- Pitch:** how high or low a musical note or sound is.
- Structure:** the parts which make up a composition e.g. section A, section B.



COMPOSITION

Definitions

What is 'harmony'?

The sound of two or more notes heard simultaneously. This includes chords and melodies heard in a piece of music.

What does 'composition' mean?

Composition is the art of creating music, by composing parts and developing ideas to create a piece of music.

Composition Tips

- ✓ Listen to a range of music for inspiration.
- ✓ Play an instrument.
- ✓ Sing and train your ears.
- ✓ Practice.
- ✓ Learn the software well.

Key Notes

Key words

SPACE NOTES

Treble clef: SPACE notes spell the word FACE.

Using music notes in composition

Crotchet: a note worth 1 beat.

Quaver: a note worth 1/2 a beat.

Minim: a note worth 2 beats.

Semibreve: a note worth 4 beats.

Ledger Line Notes in Treble Clef

Every Good Boy Deserves Fudge

KEYBOARD

Exploring Treble Clef Reading and Notation

A. Layout of a Keyboard/Piano

Octave

A piano or keyboard is laid out with **WHITE KEYS** and **Black Keys** (see section G). C is to the left of the two Black Keys and the notes continue to G then they go back to A again. Notes with the same letter name/pitch are said to be an **OCTAVE** apart. **MIDDLE C** is normally in the centre of a piano keyboard.

D. Keyboard Functions



E. Left Hand/Right Hand (1-5)

Left Hand

Right Hand

C. Keyboard Chords

G Major

F Major

A Minor

Play one – Miss one – play one – miss one – play one

F. Black Keys and Sharps and Flats

There are five different black notes or keys on a piano or keyboard. They occur in groups of two and three right up the keyboard in different pitches. Each one can be a **SHARP** or a **FLAT**. The # symbol means a **SHARP** which raises the pitch by a semitone (e.g. *C# is higher in pitch (to the right) than C*). The b symbol means a **FLAT** which lowers the pitch by a semitone (e.g. *Bb is lower in pitch (to the left) than B*). Each black key has 2 names – C# is the same as Db – there's just two different ways of looking at it. Remember, black notes or keys that are to the **RIGHT** of a white note are called **SHARPS** and black notes to the **LEFT** of a white note are called **FLATS**.

B. Treble Clef & Treble Clef Notation

A **STAVE** or **STAFF** is the name given to the five lines where musical notes are written. The position of notes on the stave or staff shows their **PITCH** (how high or low a note is). The **TREBLE CLEF** is a symbol used to show high-pitched notes on the stave and is usually used for the right hand on a piano or keyboard to play the **MELODY** and also used by high pitched instruments such as the flute and violin. The stave or staff is made up of 5 **LINES** and 4 **SPACES**.

Every Green Bus Drives Fast. Notes in the SPACES spell 'FACE'

Notes from **MIDDLE C** going up in pitch (all of the white notes) are called a **SCALE**.

Musical Knowledge : Listening

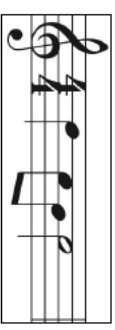
Definitions



T.DRIPS -
Use **TDRIPS** -
Tempo, Dynamics, Rhythm, Instrumentation, Pitch, Structure to describe music.

Key words

Tempo Fast Slow Allegro Lento
Dynamics Forte Piano
Rhythm straight Syncopated
Instrumentation
Pitch Treble Clef High or Low
 Bass Clef
Structure Strophic Ternary



'an act of assessing something.'

Appraisal

"What am I hearing?"

Question using key words

- How are melodies used? Are they simple or complex?
- Are the notes high or low in pitch? Do the notes make sudden leaps or move in small steps?
- Are the dynamics (volume) loud or soft?
- How would you describe the structure?
- How many different sections of music can you hear?
- How would you describe the style of music? Which genre of music would you describe it as?

When you are listening to a piece of music:

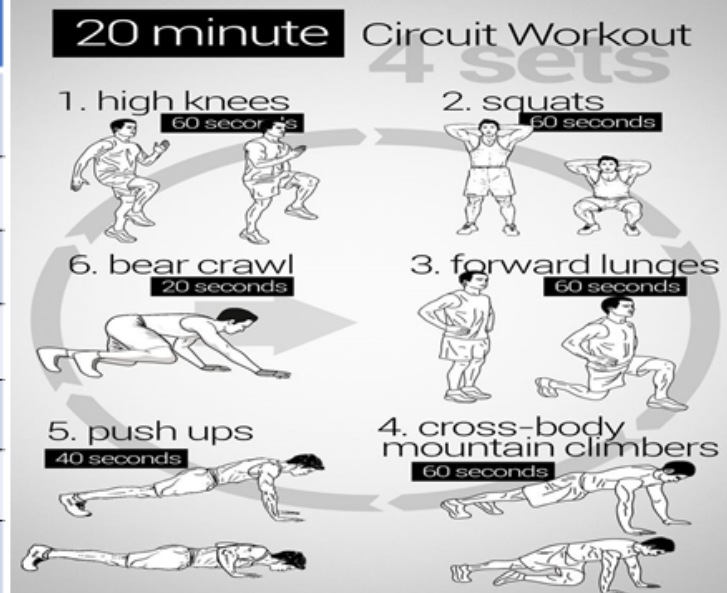
- Does it sound **happy** (major tonality) or **sad** (minor tonality)?
- Which instruments can you hear?
- How would you describe the rhythm?
- What are the **key features** of the piece?
- Which words could you use to describe the tempo? Is it fast or slow?

Year 8 Health and Fitness Knowledge Organiser

Key Words	Core Skills	
	Short term effects	Long term effects
	Cardiovascular system	Increased heart rate Increased stroke volume
Respiratory system	Increased breathing rate Increased depth of breathing	Increased lung capacity Increased number of alveoli
Muscular System	Muscle fatigue Lactic acid Increased oxygen dept	Muscle hypertrophy Increase strength of ligaments/ tendons

Training Methods In Winter Climates People Can Freeze Forever	
Interval	Periods of work followed by periods of rest.
Weight	This involves resistance training using weights aiming at improving strength and endurance of muscles.
Continuous	This involves aerobic activity for long periods of time without stopping e.g. cycling, running, swimming.
Plyometric	Jump training. This is high intensity training where the athlete performs a series of explosive jump movements, lengthening and then shortening the leg muscles.
Circuit	This involves performing a series of activities in a circuit to develop either aerobic or anaerobic fitness.
Fartlek	This involves speed play. Working at different speeds across different terrains and distances.
Fitness Classes	Body pump, Aerobics, Pilates, Yoga, Spinning.

Fitness Test	Component of fitness measured
12 minute cooper run	Cardiovascular Fitness
Vertical jump test	Power
30 metre sprint test	Speed
Illinois Agility test	Agility
Sit and reach test	Flexibility
Sit up test	Muscular Endurance
Hand grip dynamometer	Muscular Strength





The Olympics



Athletics

The Olympics was an ancient tradition and originated in Greece.

The modern-day Olympics were first held in 1896 and was hosted in Greece.

The Olympics are split into two:

- The Summer Games
- The Winter Games

Each Games' are held every four years.

Winter Olympic Games Events: alpine skiing, biathlon (cross-country skiing and target shooting), bobsled, cross-country skiing, curling, figure skating, freestyle skiing, ice hockey, luge, Nordic combined (ski jumping and cross-country skiing), skeleton, ski jumping, snowboarding, and speed skating.

The 5 Olympic rings represent the major regions in the world (Europe, Africa, The Americas, Asia and Oceania).

Every national flag of the world has at least one of the 5 colours (blue, black, red, yellow and green)

Summer Olympic Games Events: archery, badminton, basketball, beach volleyball, boxing, cycling, diving, equestrian, fencing, field hockey, gymnastics, handball, judo, modern pentathlon, mountain biking, rowing, sailing, shooting, soccer, swimming, synchronized swimming, table tennis, taekwondo, tennis, track and field, triathlon, volleyball, water polo and weightlifting.

Athletics Events

Sprints	Middle distances	Throws	Jumps
100m	800m	Javelin	Long Jump
200m	1500m	Discus	Triple Jump
300m		Shot Put	High Jump
400m			
Hurdles			

Throwing technique

Javelin

- Side on, throwing arm extended
- Javelin in line with temple
- Step threw and release at 45°



Shot Put

- Dirty neck, clean palm
- Toe, Knee, Chin
- Low to high and Push



Discus

- Disc in finger tips
- Side on
- Low to high and release



Middle Distances technique

- Slightly leaning forward
- Head position and looking forward
- Arms swinging back and forward
- Front knee lift slightly (not as high as sprinter)
- Foot – land on balls of feet.

Pacing – spreading out your energy across the whole race to have a strong finish with consistency throughout the event.



Sprint technique

- Balls of your feet
- Front Knee Drive
- Arms pumping – 'hip to lip'
- Head straight, looking forward.



Events: 100m, 200m, 300m and 400m.

Jump technique

- Take off foot behind the front of the board
- Take off with one foot; land with two feet.
- Triple Jump (Hop, Step, Jump).
- Run up and swing arms when jumping to gather momentum.

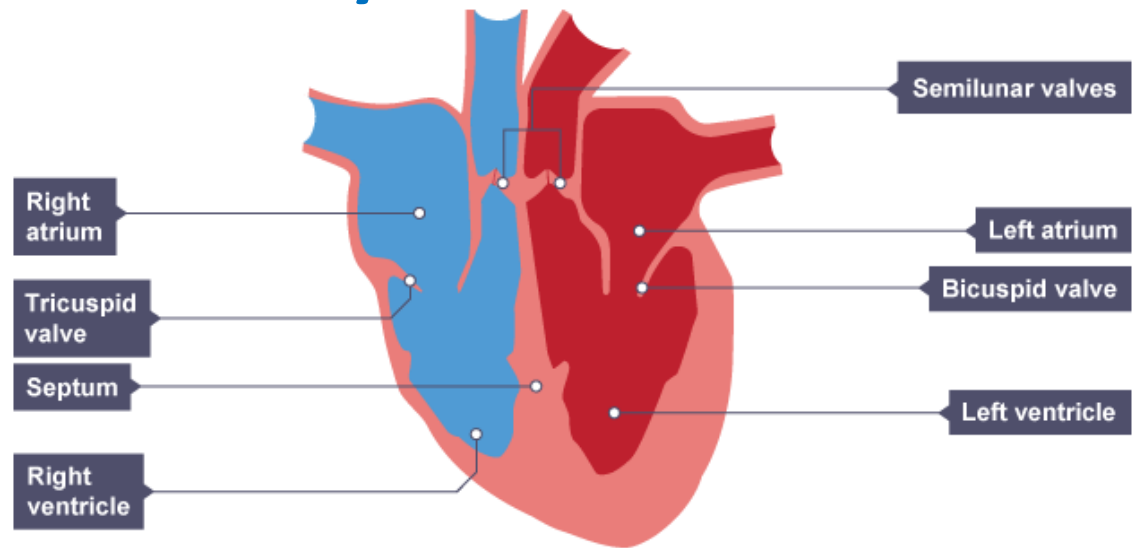
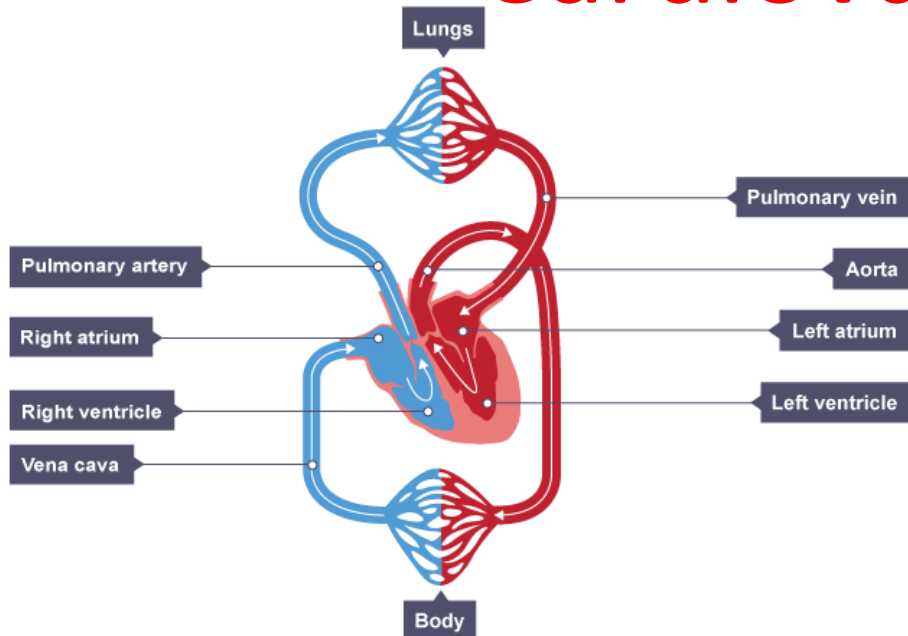


Challenge

Research current World Records.

Find out the current CTK Athletics Records.

Cardiovascular System



Artery – carries blood away from the heart (usually oxygenated blood, except for the pulmonary artery).

Vein – carries blood back to the heart (usually deoxygenated blood, except for the pulmonary vein)

Capillary – allows diffusion of gases and nutrients from the blood into the body cells

Heart Rate (HR): number of times the heart beats per minute.

Stroke Volume (SV): the amount of blood pumped out of the ventricles each time they contract.

Cardiac Output (Q): amount of blood pumped from the heart every minute.

$$Q = HR \times SV$$

Red Blood Cells – transport oxygen around the body

White Blood Cells – fight infection

Platelets – clot to prevent blood loss during injury

Plasma – liquid part of the blood

Vasoconstriction – in the cold, blood vessels near to the skin close to prevent heat being lost.

Vasodilation – in the heat, blood vessels close to the skin enlarge to allow for heat to escape the body.

Blood Pressure: when blood contracts it pushes the blood into blood vessels which creates blood pressure.

1. Systolic value – blood pressure whilst the heart is contracting
2. Diastolic value – blood pressure whilst the heart is relaxing

Three functions of the CV system:

1. Transport
2. Clotting
3. Regulate body temperature

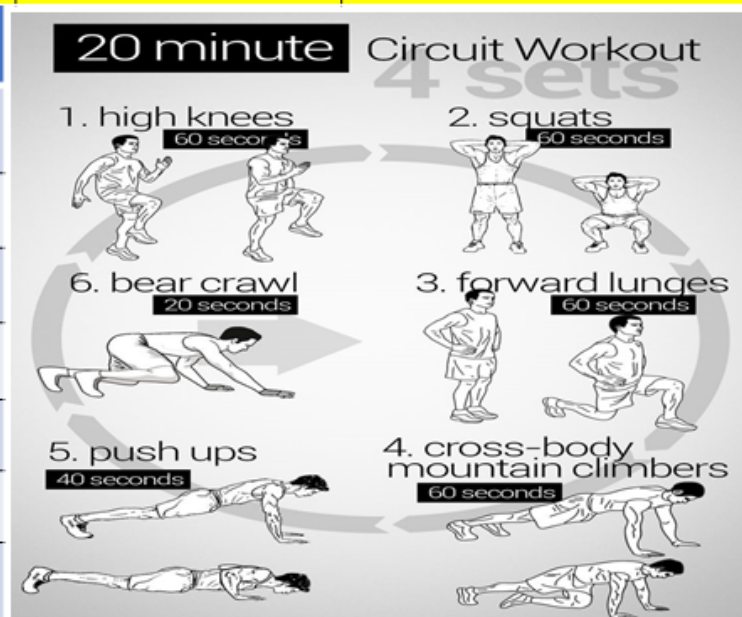
Year 8 Health and Fitness Knowledge Organiser

<u>Key Words</u>	<u>Core Skills</u>		
Interval Weight Continuous Plyometric Circuit Fartlek Fitness classes Stroke volume Lactic Acid Oxygen dept		Short term effects	Long term effects
	Cardiovascular system	Increased heart rate Increased stroke volume	Decreased resting heart rate Faster recovery rate
	Respiratory system	Increased breathing rate Increased depth of breathing	Increased lung capacity Increased number of alveoli
	Muscular System	Muscle fatigue Lactic acid Increased oxygen dept	Muscle hypertrophy Increase strength of ligaments/ tendons

Training Methods
In Winter Climates People Can Freeze Forever

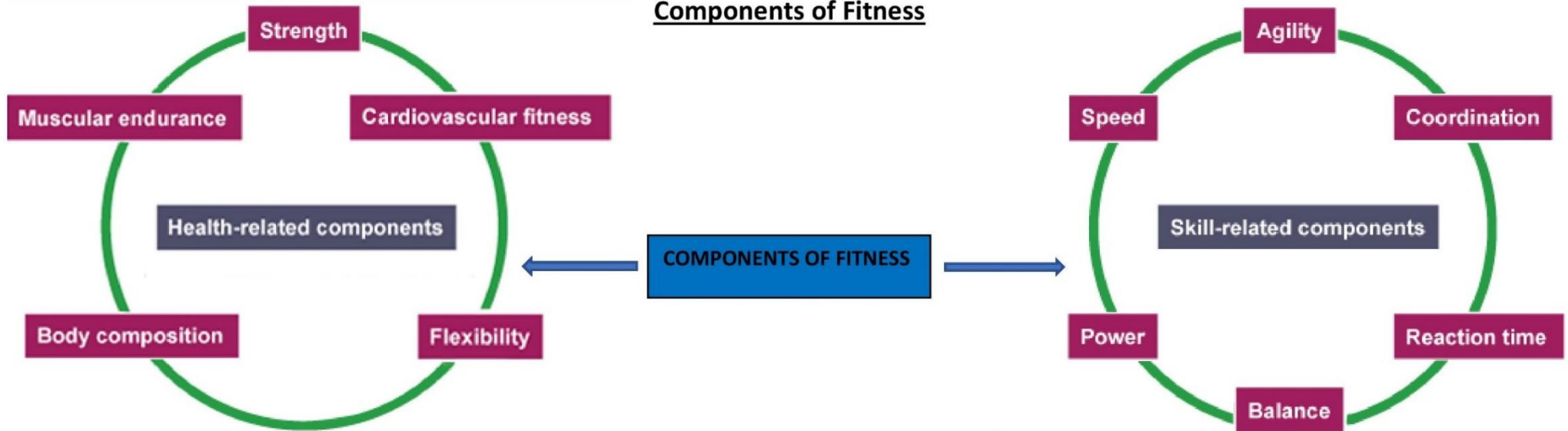
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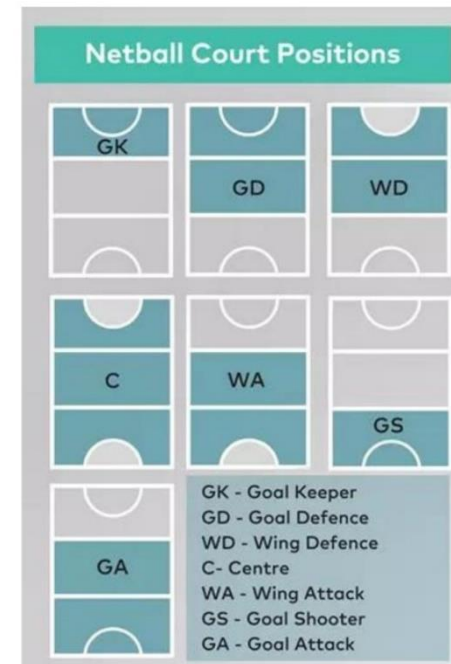
Year 8 Netball Knowledge Organisers

Components of Fitness

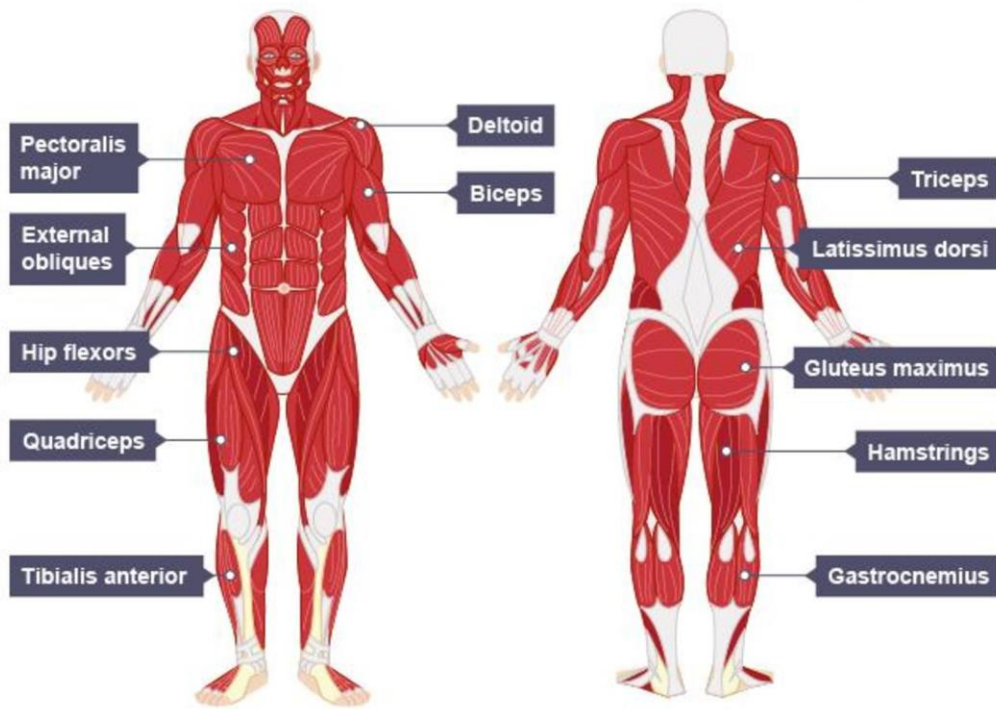


Fitness Components needed by different Netball positions

<u>GS / GA</u>	<u>C / WA / WD</u>	<u>GD / GK</u>
Coordination	Cardiovascular Fitness	Reaction time
Power	Agility	Strength
Muscular Endurance	Speed	Power



Muscular system



	Function	Example in sport
Deltoid	Abduction of the shoulder (moving the arm outwards and away from the body)	Outward arm action in a jumping jack
Pectoralis major	Adduction of the shoulder (moving the arm towards the body); Shoulder horizontal flexion (moving the arms forwards in front of the body)	Upwards phase of a press up
Triceps	Extend the elbow (straightening the arm)	Shooting in netball
Biceps	Flex the elbow (bending the arm)	Drawing a bow in archery
External obliques	Trunk rotation (turning the body sideways)	Turning the body to breathe to the side when performing front crawl in swimming
Latissimus dorsi	Shoulder adduction (moving the arm towards the body); Shoulder horizontal extension	Butterfly stroke in swimming
Hip flexors	Hip flexion (moving knee up towards the chest)	Performing a rugby conversion kick
Gluteus maximus	Hip extension (moving the leg backwards)	Pulling back leg before kicking a ball
Quadriceps	Extend the knee (straightening the leg)	Kicking a ball
Hamstrings	Flex the knee (bending the leg)	Performing a hamstring curl on a weights machine
Gastrocnemius	Plantar flexion of the ankle (pointing the toes downwards)	Standing on tiptoe to mark a goal shoot in netball
Tibialis anterior	Dorsiflexion of the ankle (bringing the toes up towards the shin)	Foot making contact with a football

Antagonistic muscle pairs

One muscle relaxes for the other to contract.

Agonist = contracting muscles; Antagonist = relaxing muscle

Examples below:

Biceps	Triceps
Hamstrings	Quadriceps
Gluteus maximus	Hip flexors
Gastrocnemius	Tibialis anterior
Pectoralis major	Latissimus dorsi

Muscle fibre types

	Type I	Type IIa	Type IIx
Speed of contraction	Slow	Fast	Very fast
Force produced	Low	Medium	High
Resistance to fatigue	High	Medium	Low

Key Words		
1	Catholic Church	The Catholic (universal) Church is that Church which traces its origins back to the Apostles
2	Christianity	Followers of Christ; divided into many denominations
3	Church of England	The established Church in this country, first formed by Henry VIII
4	Great Schism	The event in 1054, which led to the breaking of the Catholic and Orthodox Churches
5	Magisterium	The teaching authority of the Catholic Church
6	Pope	The Bishop of Rome, Head of the Catholic Church
7	Protestant	The collective name for these Churches which broke away from the Catholic Church during the Reformation
8	Reformation	A movement to reform the Church resulting in the division of the western Church into Catholicism and Protestantism

Key Quotes	
1	And I tell you that you are Peter, and on this rock I will build my church, and the gates of Hades will not overcome it. I will give you the keys of the kingdom of heaven; whatever you bind on earth will be bound in heaven, and whatever you loose on earth will be loosed in heaven.' (Matthew 16:18-19)
2	'I want to open the windows of the Church so that we can see out and the people can see in. ' (Pope John XXIII)

Unit 1: Church History



Key Facts	
1	Christians are monotheists that recognise Jesus as God and Messiah. They claim that Jesus died so that people could be forgiven of their sins and have eternal life. There are over 30,000 denominations of Christians globally.
2	Following Jesus' death, his disciples were entrusted to call the entire world to Jesus' message of love and forgiveness. They faced persecution and brutal death. St Paul was one of the most important missionaries in spreading the Christian message across Asia and Greece. However, allowing Gentiles to follow Jesus' teaching ensured the religion of Christianity has begun.
3	Life for early Christians was dangerous. Christians were hunted and martyred by Romans. Early Christians met secretly in catacombs. They held secret meetings and celebrated Mass. They also used the catacombs to bury the dead, rather than cremate them.
4	Emperor Constantine converted to Christianity, believing God helped him to defeat his enemies. Following this victory he converted. At the Council of Nicea, a Creed was written outlining the Christian beliefs that Jesus is 'true God' and 'of one substance with the father'.
5	The great Schism was the split between the Western, Roman Catholic Church and the Eastern, Orthodox Church (Istanbul), after tensions had arisen over who should be in charge and the wording of the Nicene Creed.
6	The Pope is believed to be a successor of the disciple Peter. The Pope is considered the closest link to God and has the authority of St Peter on Earth to make decisions on God's behalf. He resides in the Vatican City in Rome.
7	The Magisterium is the teaching authority of the Catholic Church. It is split into three parts: Ordinary, Conciliar and Pontifical. Together they are leaders and teachers of the faith today.
8	The Reformation refers to the movement led by Martin Luther to attempt to Reform the Church. Churches that followed his teachings were known as Protestants because they had protested against the Church. The Catholic Church responded to the issues Luther had raised and this was known as the Counter Reformation.

Key Words		
1	Covenant	An agreement or promise between God and people
2	Descendant	A future relation, for example, a child or child's child
3	The Fall	Adam and Eve's disobedience towards God by eating the forbidden fruit, bringing sin and evil into the world
4	Garden of Eden	The garden created by God for Adam and Eve to live in
5	Genesis	The first book in the Bible; it literally means 'origin'
6	Israelites	A name given to Abraham's descendants, chosen by God to be a great nation and have their own land
7	Old Testament	The first part of the bible, written between 800 BCE and 165 BCE
8	Original Sin	The Christian belief that everybody is born with a desire to do wrong

Unit 3: Biblical Literacy
Old Testament - Genesis



Key Quotes	
1	Thus the heavens and the earth were completed in all their vast array... This is the account of the heavens and the earth when they were created, when the LORD God made the earth and the heavens. (Genesis 2:2-4)
2	You are to bring into the ark two of all living creatures, male and female, to keep them alive with you. 20 Two of every kind of bird, of every kind of animal and of every kind of creature that moves along the ground will come to you to be kept alive. (Genesis 6:19-20)

Key Facts	
1	The bible is a collection of 66 or more separate books written by about 40 different authors over several centuries. These books are organised into two sections: the Old Testament and the New Testament
2	Christians believe that the Bible is inspired by God. Some interpret the Bible literally and others think that some of its stories are myths.
3	In Genesis, God creates the first humans, Adam and Eve, and tells them they can eat the fruit from any tree in the Garden of Eden except the tree that 'gives them knowledge of good and evil.' They disobey him, and Christians believe this brought original sin into the world.
4	Adam and Eve had two sons called Cain and Abel. Christians believe the effects of original sin can be seen in Cain's murder of his brother Abel.
5	According to Genesis, as the earth's population increased, so too did the violence and evil. God decided to send a great flood to wipe out the human race, but he told a good man named Noah to build an ark to save himself and his family.
6	God wanted to establish a special nation of people who would follow his laws and be an example to others., He chose a man named Abraham to be the father of this nation. He tested Abraham's suitability by asking him to sacrifice his son, Isaac.
7	Isaac had two sons, Jacob and Esau. Jacob had 12 of his own sons, including Joseph. Joseph's brothers disliked him because he was his father's favourite and dreamed of his brothers bowing down to him.
8	Joseph's brother sold him into slavery in Egypt, where he work for Potiphar before being imprisoned when Potiphar's wife accused him of trying to get into bed with her. He was released from prison after interpreting Pharaoh's dreams. The pharaoh made him the second most powerful man in Egypt.

Key Words		
1	Covenant Box	A special box containing the stone tablets on which the Ten Commandments were inscribed
2	Exile	Being forced to live outside the country of your birth
3	Exodus	The Israelites' journey out of Egypt
4	Messiah	A saviour, or rescuer, sent by God
5	Passover	A Jewish festival remembering the Israelites' freedom from slavery in Egypt
6	Promised Land	The land of Canaan, which God promised to give the Israelites
7	Ten Commandments	The 10 rules given by God to Moses for the Israelites to follow
8	The Ten Plagues	The 10 disasters that God inflicted on the people of Egypt to convince the pharaoh to free the Israelites

Unit 3: Biblical Literacy
Old Testament – Exodus
to exile



Michelangelo's David



Key Quotes	
1	God said to Moses, 'I AM WHO I AM. This is what you are to say to the Israelites: "I AM has sent me to you."...' 'Say to the Israelites, "The LORD, the God of your fathers – the God of Abraham, the God of Isaac and the God of Jacob – has sent me to you..."' (Exodus 3:14-15)
2	Then the fire of the Lord fell and burned up the sacrifice, the wood, the stones and the soil, and also licked up the water in the trench. When all the people saw this, they fell prostrate and cried, 'The Lord – he is God! The Lord – he is God!' (1 Kings 18:38-39)

Key Facts	
1	The second book of the bible, Exodus, begins with the king of Egypt trying to drown all the Israelite babies, but Moses was saved by the Pharaoh's daughter.
2	Moses left Egypt to work as a shepherd in Midian because the pharaoh wanted to kill him for murdering an Egyptian. Whilst shepherding, God spoke to him from a burning bush, telling him to return to Egypt and free the Israelites from slavery.
3	At first the pharaoh was unwilling to free the Israelites from slavery, but he changed his mind after God sent 10 plagues to Egypt.
4	Moses led the Israelites out of Egypt through the Red Sea and into the desert. God gave the Ten commandments to Moses on Mount Sinai.
5	Joshua led the Israelites into the land that God had promised, but the Israelites started to worship the gods of other tribes. God sent them strong leaders known as the Judges. Samson was one of the Judges, whose strength came from his long hair, which was shaved off while he slept.
6	David defeated the giant Philistine Goliath with a stone and became Israel's second king after the death of Saul.
7	While David was king he committed adultery with Bathsheba and then arranged the killing of her husband, Uriah.
8	God sent prophets like Elijah, who took part in a contest with the prophets of Baal on Mount Carmel to prove his God was real.



Key Words

1	Bethlehem	The city where Jesus was born
2	Fast	To eat very little or no food; at the time of Jesus, Jews often fasted as a way of helping them focus on God
3	Gospels	The first four books of the New Testament; the word 'Gospel' means 'Good News'
4	Incarnation	God coming to earth as a human
5	Ministry	The name given to the last three years of Jesus' life, spent preaching and performing miracles
6	Parable	A short story intended to make a particular point or tell a moral lesson
7	Sermon on the Mount	A sermon given by Jesus giving guidance on how people should live their lives
8	Trinity	The belief that God is three as well as one; Father, Son and Spirit

Key Quotes

1	When all the people were being baptised, Jesus was baptised too. And as he was praying, heaven was opened and the Holy Spirit descended on him in bodily form like a dove. And a voice came from heaven: 'You are my Son, whom I love; with you I am well pleased.' (Luke 3:21-22)
2	But I tell you, do not resist an evil person. If anyone slaps you on the right cheek, turn to them the other cheek also. (Matthew 5:39)

**Unit 3: Biblical Literacy
New Testament – Life & Teaching of Jesus**



Key Facts

1	The first four books in the New Testament are named after the people who may have written them; Matthew, Mark, Luke and John. Together they are known as the Gospels. Each of these books is about a man called Jesus who lived about 2,000 years ago
2	Bible scholars think that most of the books in the New Testament were written within 70 years of Jesus' death, and some within 20 years.
3	Matthew and Luke record the events of Jesus' birth, saying he was born to Mary in Bethlehem, but there are also differences between their accounts.
4	Luke says that at the age of about 30, Jesus was baptised by his cousin John and went into the wilderness, where he fasted for 40 days and nights and where the devil tried to tempt him in three ways.
5	The Gospel writers record Jesus performing many miracles, including turning water into wine, feeding the 5,000, walking on water and healing lepers and a paralysed man.
6	The Gospels record Jesus coming into conflict with the Pharisees because he is criticised their ways of living, preferred to spend time with outcasts and claimed he could forgive sins, which they view as blasphemy.
7	Jesus' teachings – for example, the Sermon on the Mount, the Golden Rule and parables, including the prodigal son and the good Samaritan – are recorded in the Gospels. Jesus taught that people should love God and love other people.
8	Christians believe that Jesus was human but they also believe he was God living on earth. They call God coming to earth as a human the incarnation. Christians believe in the Trinity.

Golden Rule: Do to others what you would have them do to you

**Unit 3: Biblical Literacy
New Testament – Jesus
in Jerusalem**

Key Words		
1	Ascension	Jesus' return to heaven after his resurrection
2	Crucify	To kill a person by nailing them to a large wooden cross
3	Garden of Gethsemane	The garden where Jesus was arrested
4	Las Supper	Jesus' final meal with the disciples, where he predicts Peter's denial and Judas' betrayal
5	Palm Sunday	The day Jesus entered Jerusalem on a donkey
6	Pentecost	The day that the Disciples were filled with the Holy Spirit
7	Prophecy	A prediction that something will happen
8	Reconciliation	Repairing our relationship with God by accepting we have done wrong and asking for forgiveness

Key Quotes	
1	... he scattered the coins of the money-changers and overturned their tables. To those who sold doves he said, 'Get these out of here! Stop turning my Father's house into a market!' (John 2:15-16)
2	Saul...began to preach in the synagogues that Jesus is the Son of God. All those who heard him were astonished and asked, 'Isn't he the man who caused havoc in Jerusalem among those who call on this name? And hasn't he come here to take them as prisoners to the chief priests?' (Acts 9:19-21)



Key Facts	
1	In the week before this death, Jesus rode into Jerusalem on a donkey and was greeted by crowds who put down palm leaves. Christians remember this on Palm Sunday.
2	The first three Gospel writers say that Jesus caused a disruption in the temple in the week leading up to his death, known as the 'cleansing of the Temple'. John places this story at an earlier point in Jesus' life.
3	According to the first three Gospels, Jesus ate a meal with his disciples the night before he died. He told them to eat bread and drink wine in remembrance of him. He also predicted that he would be betrayed Judas Iscariot and deserted by the other disciples.
4	Jesus was arrested in the Garden of Gethsemane by the Jewish authorities. The Jewish leaders could not kill Jesus themselves because they were living under Roman rule, so they accused Jesus of treason to Pontius Pilate, who sentenced him to death.
5	Jesus was mocked, tortured and killed by a method of called crucifixion. He dies with a sign above him saying 'King of the Jews'. According to Luke, Jesus promised a criminal on a cross next to him that he would be ion paradise with him that day.
6	The Gospel writers have differing claims that after Jesus' death he was resurrected. Christians believe that Jesus' death and resurrection made it possible for sins to be forgiven and be reconciled with God.
7	The growth of the Christian Church after Jesus' death is recorded in the book of Acts. After being filled with the Holy Spirit on the day of Pentecost, the disciples spread the message about Jesus.
8	A Pharisee named Saul/Paul originally persecuted Christians, but he converted to Christianity following a dramatic experience on the road to Damascus. He is credited with writing 13 of the books of the New Testament, although biblical scholars disagree about whether all 13 of them were actually written by him.

Key Words

1	Caste	A series of social classes that determine someone's job and status
2	Gurdwara	The Sikh place of worship; it literally means 'doorway to the Guru'
3	Gurmukhi	A language created by the Gurus and used to write the Guru Granth Sahib
4	Guru	A religious teacher or guide who leads a follower from spiritual ignorance (GU, darkness) into spiritual enlightenment (RU, light)
5	Guru Granth Sahib	the Sikh holy book; the name means 'from the Guru's mouth'
6	Khalsa	the community of Sikhs founded by the 10th Guru, Gobind Singh
7	Khanda	the symbol of Sikhism, made up of two double edged swords, one sword in the middle and a circle
8	Sikh	A follower of Sikhism; it comes from the Sanskrit word shishya, which means 'disciple' or 'learner'

Key Quotes

1	The Kings are butchers and cruelty is their knife. Their sense of duty has taken wings and flown. (Guru Granth Sahib 145:10)
2	If I had 100,000 tongues, and these were then multiplied twenty times more, with each tongue, I would then repeat, hundreds of thousands of times, the Name of the One, the Lord of the Universe. (Guru Granth Sahib 7:6-7)

**Unit 4 - Sikhism
History and Belief**



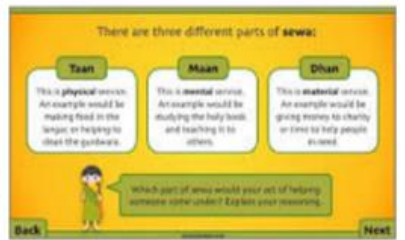
Key Facts

1	There are around 25 million Sikhs in the world today, most of them (19 million) living in India.
2	Sikhism began with a man called Nanak, who received a revelation when he was 30 in which he understood that although there are many different religions there is only one God. God loves all people equally no matter what religion they follow.
3	Nanak made four long journeys over a period of 20 years, spreading word of his revelation. He visited and talked to Buddhists, Muslims and Hindus.
4	The story of the miracle of milk and blood emphasizes one of Guru Nanak's important teachings – that of working hard and honestly.
5	Guru Arjan is famous for building the holiest site in the world for Sikhs, the Harmandir Sahib, and for being the first Sikh martyr after his death at the hands of the Mughals.
6	The Sikh symbol of the Khanda was established by Guru Hargobind, who put on two swords to indicate his spiritual authority (piri) and his worldly authority (miri).
7	The last of the human Gurus was Gobind Singh, who established the Khalsa, a brotherhood of Sikhs established to protect their people from persecution.
8	Before he died, Gobind Singh said that the collection of Sikh holy scriptures, the Guru Granth Sahib, would be the eleventh and final – eternal – Guru. It is a collection of scriptures collected over 150 years that is highly revered by Sikhs, who look to it for guidance and leadership and use it in worship services and special ceremonies.

Key Words		
1	Atma	The soul.
2	Diwan Hall	The main hall in the a gurdwara, where worship services take place.
3	Gurmukh	Someone who puts God and the teachings of the Gurus at the centre of their life.
4	Karma	The forces that influence people's future rebirth.
5	Maya	The temporary and illusory nature of the world.
6	Mukti	Union with Waheguru; to escape the world of illusion and the cycle of life, death and rebirth.
7	Nishan Sahib	A flag that flies over every gurdwara.
8	Sewa	Selfless service to others.

Key Quotes	
1	[There is] no Hindu nor Muslim, but only man. So whose path shall I follow? I shall follow God's path. God neither Hindu nor Muslim and the path which I follow is God's. (Guru Nanak)
2	When all efforts to restore peace prove useless and no words avail Lawful is the flash of steel. It is right to draw a sword. (Zafarnama (letter written by Guru Gobind Singh regarding Sikh beliefs on war))

Unit 4 - Sikhism In the Modern World



Key Facts	
1	Sikhs believe that we are all in a cycle of birth, death and rebirth. We can influence our rebirth by our actions in this life (karma). The ultimate goal is to reach mukti – freedom from this cycle and union with God.
2	The Sikh place of worship is called a gurdwara. An orange flag called a Nishan Sahib always flies above a gurdwara.
3	During Sikh services, the Guru Granth Sahib is placed on a throne in the Diwan Hall; the people all sit on the floor during the service.
4	The langar is a communal place for cooking and eating; every gurdwara must have a langar, which is open to everyone, whatever their gender, ethnicity or religion. In recent years, many non-Sikhs living in poverty have started to visit langars to have a meal each day.
5	Sewa, serving others, is a key Sikh belief. There are 3 forms of sewa; (tan (physical service), man (mental service) and dhan (material service, which includes giving to charity).
6	Sikhs believe it is acceptable to fight as long as this is a last resort and is in self-defence or in defence of innocent people.
7	Most Sikhs in the UK today are descendants of people who left the Punjab after the partition of India in 1949. However, there were Sikhs in the UK beforehand, and the first gurdwara was built in London in 1911.
8	In recent years there has been controversy over marriages between Sikhs and people of other faiths, with some Sikhs concerned that this may lead to the extinction of the Sikh religion in the long term. Other Sikhs stress the idea of equality that Sikhism embraces and say that Sikhs should be free to marry whomever they love.












Year 8 – Design Technology: - Resistant Materials

Key topics: Motion and Mechanisms, Product Analysis – ACCESSFM, Vacuum Forming and Polymers, Electronic components, soldering and Health and Safety

1. Key Vocabulary & Definition

Motion	This is the action of a process or something being moved
Levers	A ridge or bar resting on a pivot
Mechanisms	Systems of parts working together in a machine
Mechanical advantage	the ratio of the force produced by a machine to the force applied to it, used in assessing the performance of a machine. $MA = \frac{\text{Load}}{\text{Effort}}$
Anglepoise	a jointed arm and counterbalancing springs that hold it in any position to which it is adjusted.
Structure	a selection of many parts that make up an object that may support, hold or contain.
Force	a push or pull upon an object resulting from the object's interaction with another object.
Effort	the amount of force applied by the user, also referred to as the input.
Product Analysis	primary research and involves looking at existing products, working out how they were made and seeing what features might be useful to any possible new design. Product analysis can often be referred to as ACCESS FM.
Vacuum Former	Use to heat a single sheet of polymers to a temperature which allows the plastic to be stretched and formed over a mould.
Polymers	Polymers are materials made of long, repeating chains of molecules.
Electric current	A flow of electrons
Circuit	An unbroken loop that allows the electrons to flow
Conductor	A material that allows electrons to flow freely e.g. a copper wire
Insulator	A material that doesn't allow electrons to flow through them e.g. the plastic sleeving on a cable
System	A system is a set of devices or things which are connected and work in conjunction with each other in order to perform a specific function.

2. Motions and Mechanisms

	Reciprocating motion is a repetitive back and forth or up and down movement. E.g. a sewing machine needle 		Linear motion is when an object moves in a straight line. E.g. Usain Bolt running 100 metres 
	Rotary motion is when an object moves around a fixed point or axis. E.g. handles of a clock or a spinning top 		Oscillating motion is when an object moves to and fro from a pivot or fixed point. E.g. a swing or pendulum 
<p>Class 1 Lever have the Fulcrum between the Force and the Load. E.g. pliers, scissors, a crowbar, a claw hammer, a see-saw </p> <p>Class 2 Lever have the Load between the Force and the Fulcrum. E.g. stapler, nut-cracker, wheel-barrow and nail clipper </p> <p>Class 3 Lever have the Force between the Load and the Fulcrum. E.g. Fishing rod, arm, and broom </p>			


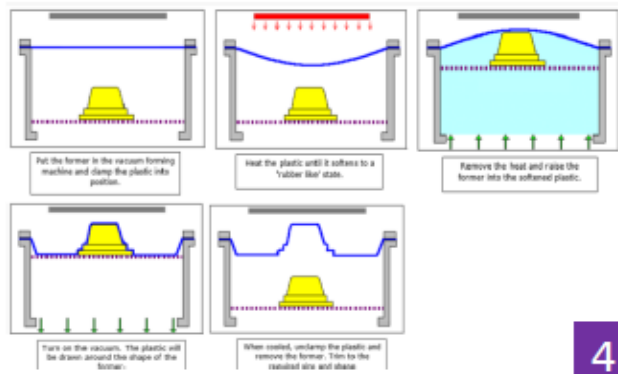
We use **ACCESS FM** to help us write a **specification** - a list of requirements for a design - and to help us **analyse and describe** an already existing product.

ACCESS FM - Helpsheet

A is for Aesthetics	 Aesthetics means what does the product look like? What is the: Colour? Shape? Texture? Pattern? Appearance? Feel? Weight? Style?
C is for Cost	 Cost means how much does the product cost to buy? How much does it: Cost to buy? Cost to make? How much do the different materials cost? Is it good value?
C is for Customer	 Customer means who will buy or use your product? Who will buy your product? Who will use your product? What is their: Age? Gender? What are their: Likes? Dislikes? Needs? Preferences?
E is for Environment	 Environment means will the product affect the environment? Is the product: Recyclable? Reusable? Repairable? Sustainable? Environmentally friendly? Bad for the environment? 4R's of Design: Recycle / Reuse / Repair / Rethink / Reduce / Refuse
S is for Size	 Size means how big or small is the product? What is the size of the product in millimetres (mm)? Is this the same size as similar products? Is it comfortable to use? Does it fit? Would it be improved if it was bigger or smaller?
S is for Safety	 Safety means how safe is the product when it is used? Will it be safe for the customer to use? Could they hurt themselves? What's the correct and safest way to use the product? What are the risks?
F is for Function	 Function means how does the product work? What is the product's job and role? What is it needed for? How well does it work? How could it be improved? Why is it used this way?
M is for Material	 Material means what is the product made out of? What materials is the product made from? Why were these materials used? Would a different material be better? How was the product made? What manufacturing techniques were used?

3

Vacuum forming

4

Polymers	Uses
Acrylic (PMMA)	is a transparent thermoplastic used as a lightweight, shatter-resistant alternative to glass. Acrylic comes in different colours is typically used in sheet form create various products such as acrylic mirrors and other artifacts.
High Impact Polystyrene (HIPs)	Thermoplastic used for display and signage. It comes in lots of colours, has good electrical conductivity, impact-resistant material, which makes it easy to vacuum form, extrude, bend and mould into shape. It is environmentally friendly, as it can be recycled.
Polyethylene terephthalate (PET)	has excellent chemical resistance to organic materials and water and is easily recyclable. It has a high strength to weight ratio and is typically used in containers for foods and liquid and many other products that we use everyday.
Epoxy Resin (ER)	A thermosetting plastic that has high strength, versatility and excellent adhesion to variety of surfaces. Effective electrical insulation, Chemical and solvent resistance, and. Low cost and low toxicity
Urea-Formaldehyde (MF)	Thermosetting plastic used as wood glue for bonding manufactured boards and materials such as particleboard. UF is commonly used when producing electrical appliances casing (e.g. desk lamps).
Melamine-formaldehyde (MF)	Melamine formaldehyde laminates are used to surface walls, cabinets and counters, and to make decorative laminated panels. Melamine formaldehyde mouldings are hard, scratch- and impact-resistant, and resistant to shrinkage and heat.

6

Thermo		Thermosetting		Elastomers	
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Soldering Health and Safety

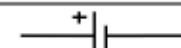
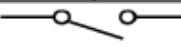

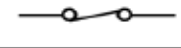

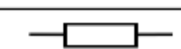


- Soldering irons and holders get very hot.
- Be careful not to burn yourself.
- If you burn yourself then walk to the sink and run your it under the cold tap.
- Always place your soldering iron in the holder when you are not using it.
- Only one person should be soldering at a time.
- Always wear goggles and an apron.
- Soldering creates gases which you should try to not breath in.
- Sit on a stool whilst soldering.
- Never touch the soldering iron to see if it is on.




5

7. Electronic Components and Systems

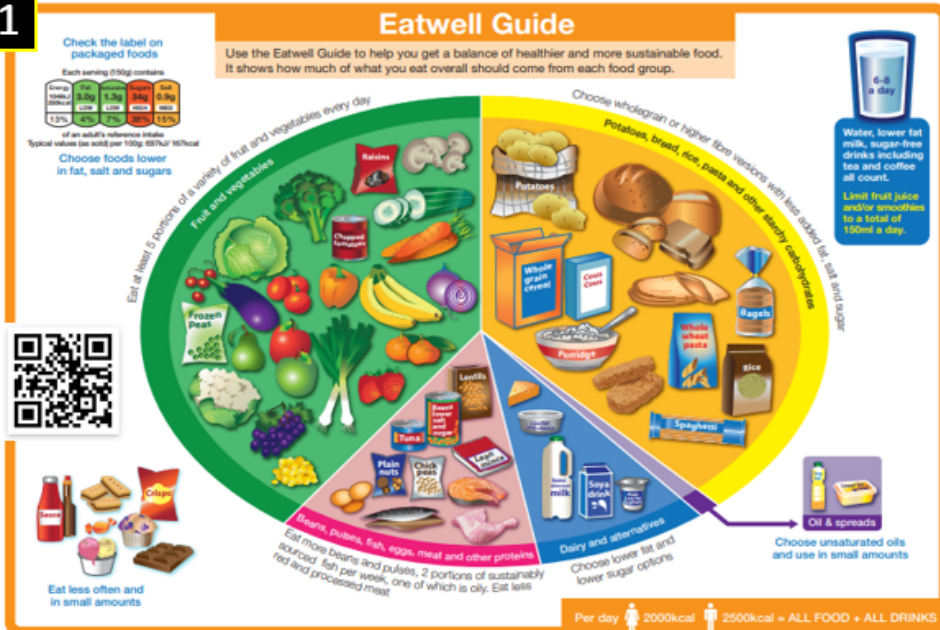
INPUT	PROCESS	OUTPUT
Input devices receive an external signal that triggers the start of the system.	This is what happens to the input to change it to an output. Process devices make all the decisions.	This is the result of the system.

Component	Purpose	System
	Cell Source of current electricity	Input
	open switch (off) Stops the flow of current	Process
	lamp Converts electrical energy into light	Output
	closed switch (on) Allows the flow of current	Process
	LED (light emitting diode) A semiconductor light source that emits light when current flows through it.	Output
	resistor Controls the flow of electricity in the circuit	Process
	battery Two or more cells joined together	Input
	LDR (light dependent resistor) A photo-conductive cell that decreases resistance. It depends on the light falling on its surface.	Output

Year 8 – Food Preparation and Nutrition:
Special Diets and Food Origins

Key topics: Nutritional needs of others, health issues associated with a poor diet, religious diets and food choices, food origins, organic and intensive farming, food miles and seasonality.

1



2

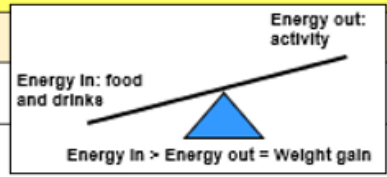
Different ages have different nutritional needs

Age	Definition
Young children	Diet should be based on the Eatwell guide. Children have small stomachs and should have small meals more frequently. Dairy is important for calcium. They should be encouraged to try new foods.
Children	They are very active and growing rapidly. Need a balanced diet, sugar and snacking should be avoided.
Teenagers	Growth is in spurts, protein required for muscles and calcium for skeleton. Teenage girls begin mensuration (blood loss – loss of iron). Teenagers deal with stress and this can lead to poor eating habits.
Adults	Stop growing so needs don't vary much. Eatwell guide should be followed. Metabolic rate slows through age. Muscle is lost and fat gained.
Elderly	Usually less active and need less energy. Taste and smell can change which affects enjoyment. Calcium, vitamin D and B12 are important.







4

Diet Related Health Problems

Health Problem	Definition
Malnutrition	Having intakes of energy and/or nutrients below or in excess of needs for long periods of time can affect health.
Over nutrition	The most common over nutrition problem is obesity caused by too much energy being consumed, or high levels of inactivity.
CHD & High Cholesterol	Coronary heart disease (CHD) is caused by a narrowing of the blood vessels to the heart. This reduces the flow of blood to the heart. High levels of cholesterol in blood increase the risk of CHD.
Type 2 Diabetes	Diet plays a strong role in preventing type 2 diabetes, a condition that causes the level of sugar (glucose) in the blood to become too high.
Anaemia	A condition caused by insufficient iron in the body. Common symptoms include tiredness and lethargy.
Bone Health	Calcium is important for strong bones. Vitamin D is needed for calcium to be absorbed from food.
Cancer	There are some foods that are directly linked to cancer, but our overall diet is more important than these individually and a healthy balanced diet can reduce the risk of some types of cancer.



3 Food choice and religious diets

							MORE INFO
BUDDHISM	Preferable to be vegetarian and refrain from meat				✓	✓	Many people will not eat meat or fish, and monks have additional restrictions.
HINDUISM	✗	✗	✗	✗	✓	✗	Vegetarian diet, while fasting is observed on certain days and certain foods are forbidden.
ISLAM	*HALAL	✗	*HALAL	✓	✓	✗	Anything with pork and lard is forbidden, and Halal foods are allowed.
JUDAISM	*KOSHER NOT WITH DAIRY	✗	*KOSHER NOT WITH DAIRY	NO SHELLFISH	NOT WITH MEAT	✓	Certain foods are restricted during Passover such as leavened products i.e. bread. Eating and drinking during fast days are prohibited.
CHRISTIANITY / ROMAN CATHOLICISM	✓	✓	✓	✓	✓	✓	Meat is restricted on Fridays of Lent, Ash Wednesday, and Good Friday (fish is permitted). Fasting is practiced.
SIKHISM	*Halal and *Kosher in some sects				✓	✗	Lacto-vegetarian diet in temples, while not forbidden from meats (individual choice).

6

	Intensive Farming	Organic Farming
Quantity (yield)	High yield, large amounts of food produced.	Lower yield of crops and more is lost and less is grown.
Pesticides	Keep pests away resulting in more crop.	Pesticides restricted, natural predators encouraged
Animals	Battery rearing of animals in enclosures, less humane and can cause disease to spread quickly through the animal population..	Animals have a better quality of life with access to outdoors. Animals not given antibiotics.
Labour	Artificial chemicals and machines means fewer people are needed for work	More people are needed to work the farms.
Fertilisers	If too much is used, it can wash in to streams and lead to pollution.	Only natural fertilisers are used along with crop rotations.
Cost	Low cost of production but a high initial set up, maximum output is achieved resulting in a lower cost for consumers	Production is lower and more space is needed, resulting in higher cost produce for consumers.

5 Where our food comes from



This symbol means that the products have come from farmed animals that have been inspected to **VERY high welfare standards** – providing them with physically and mentally stimulating environments from birth to slaughter.



This symbol means that the food you buy has been **responsibly sourced** from **British** farmers, safely produced and comes from crops and animals that have been well cared for



This logo is stamped on to egg to certify that they are **British** and that the **hens have been vaccinated** against Salmonella.



This symbol means that the product is certified to **high organic standards** and provides an assurance of organic authenticity.

7 Key Terms

Key terms	Definition
Health Balanced Diet	A balanced diet is based on the Eatwell Guide. An unbalanced diet can lead to dietary related diseases.
Dietary law	In many religions and cultures texts and teachings, include rules and advice, state which foods should or shouldn't be eaten.
Halal	refers to foods that are allowed to be eaten according to Islamic law, and how and animal is slaughtered.
Kosher	Is a word used to describe food and drink that complies with Jewish religious dietary law, and refers to how and animal is slaughtered.
Organic	Food produced without the use of chemical fertilisers, pesticides or other artificial chemicals.
Intensive farming	A way of producing large amounts of crops, by using chemicals and machines as well as keeping animals indoors to restrict movement.
Seasonal	The times of the year when the harvest or the flavour of a food is at its peak.
Food miles	The distance food is transported from the time of its making, until it reaches the consumer.

Key Words

1	Anthropometrics	The study of the human body and its movement, often involving research into measurements relating to people. It also involves collecting statistics or measurements relevant to the human body, called Anthropometric Data .
2	Ergonome	Ergonomes are models of people in normal proportions.
3	Ergonomics	Defined as the science of fitting a workplace to the user's needs, <i>ergonomics</i> aims to increase efficiency and productivity and reduce discomfort
4	Product Analysis	Examining product features, costs, availability, quality, appearance and other aspects. We can use the acronym ACCESS FM to help us remember the key features of a product Analysis
5	Triangulation	Triangulation involves the use of triangular shapes to give stability to structures
6	Biomimicry	a practice that learns from and mimics the strategies found in nature to solve human design challenges
7	Crating	Using sketched 3D cubes/ cuboids to help structure more complex drawings
8	Attachment Techniques	Ways to join pieces of material together. In the case of this project it refers to modelling materials

Scaling:

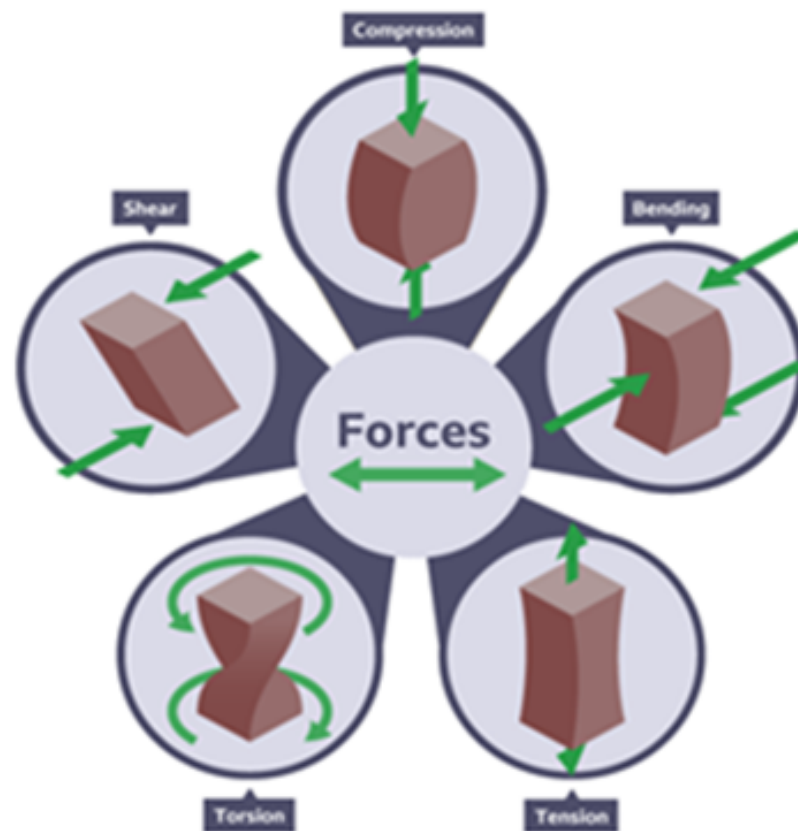
Scaling is a drawing method used to enlarge or reduce a drawing in size while keeping the proportions of the drawing the same. Scales are generally expressed as ratios.

1:1	Full size		
1:2	Half of the original size	2:1	Twice the original size
1:5	A fifth of the original size	5:1	Five times larger than the original size
1:10	A tenth of the original size	10:1	Ten times larger than the
1:20	A twenty-fifth of the original size	25:1	Twenty five times larger than the original size

A	Aesthetics	Appearance: colour, shape, texture, design style
C	Cost	How much does the product cost? How much would it cost to manufacture?
C	Customer	Who is it aimed at? Will this person be buying the product for themselves?
E	Environment	Environmental impact of the product. From manufacture, use and disposal
S	Safety	H&S considerations of a product during use and manufacture
S	Size	Dimensions of a product. Consider ergonomic aspects to the design
F	Function	What is its job?
M	Manufacture/ Materials	How is it made? What is it made from?

Tools, equipment and joining methods

1	Craft Knife	As a handy tool for use in the creation of various craft projects, the craft knife is a single bladed knife that easily cuts through a variety of different materials. The craft knives we use in school have a plastic handle and a retractable blade.
2	Cutting Board	self healing cutting mats are purpose-built to be extremely durable and resilient, creating the perfect cutting surface that reduces blunting but also ensures any worksurface is well protected from damage . They often have lines printed on them to help you when cutting straight lines
3	Metal Rule	Metal safety Rule's features a unique M profile which allows you to keep your fingers well away from any knife edge when used for cutting or scoring. They are made from metal to prevent the rule being damaged by the blade of a craft knife
4	Glue Gun	a glue gun is an electrical device that uses a heating element to heat up and melt specially made solid hot glue sticks. Once melted, the glue is then directed out of the nozzle of the gun on to a given object to either stick and hold it in place or repair it
5	Tab	An extra rectangle added to a piece of card/ paper. Tabs are folded over, glued and used to add support when joining two piece s of material together
6	Flange	A number of tabs cut around the base of a tube. These are flattened down to give more surface area to glue the tube to a surface
7	Gusset	Triangular shaped support that add strength when joining two piece of material at a 90 degree angle
8	Split Pin	A metal pin that has two legs that can be spilt when joining two pieces of card of paper. It allows for rotational movement when modelling



Modelling Materials	
1	Styrofoam
2	Foam Board
3	Corrugated Cardboard
4	Balsa Wood
5	Plasticine
6	Art Straws

CAD / CAM terms	
1	CAD = Computer Aided Design
2	CAM = Computer Aided Manufacture
3	Google Sketchup = 3D CAD package
4	2D Design = CAD package we use with the laser cutter
5	CNC Machine = Computer Numerical Control Machine

DT Year 8 Fabrics and Fibres

Iterative design: The iterative approach to designing is a flexible way of designing by working through ideas with sketches and notes and developing models when they are needed. It is a journey that could have a number of different starting points and outcomes.



The iterative approach gives the designer the freedom to follow an idea in the direction that feels best for that idea. The designer's tools of sketching, modelling, testing and evaluating may be used in any order as long as they support rather than hinder the flow of ideas.

Needle		Used to hand sew fabric and creating embroidery designs. The 'eye' of the needle is where the thread is fed through.
Pins		Used to hold fabrics in place when sewing, with an 'in/out' motion.
Machining Thread		Used to sewing fabrics together, either by hand or with a sewing machine.
Fabric Shears		Used to cut fabrics and threads only, not paper.
Embroidery Scissors		Used to cut delicate work into fabrics and trim threads.
Embroidery Thread		Comes with 6 threads intertwined that can be 'split' to reduce the thickness. Used to create decorative stitches on products.
Sewing Machine		A electrical product that is used to sew fabrics together securely. The machine can produce a range of stitches including straight & zig-zag.
Tape Measure		Used to measure fabrics and the human body to help make patterns accurate to the desired size.

Over locker		A electrical machine that neatens the edge of fabric to prevent fabric from fraying.
Aida Fabric		Fabric used to create embroidery designs.
Pattern		Used as a template for cutting out pieces of a textile product.
Seam Allowance		Added to pattern to ensure that the products ends up in the correct size.
Fabric		Used to create a range of different products, including toys & clothing. Comes in a range of different lengths, widths, colours, finishes & patterns. Can be either Natural or Man-made.
Ironing/Pressing		Method of removing creases from fabrics to give products a better finish.
Design		A process that is completed to communicate your ideas clearly.
Colour Wheel		Using knowledge of colour to make your product stand out and appeal to others.

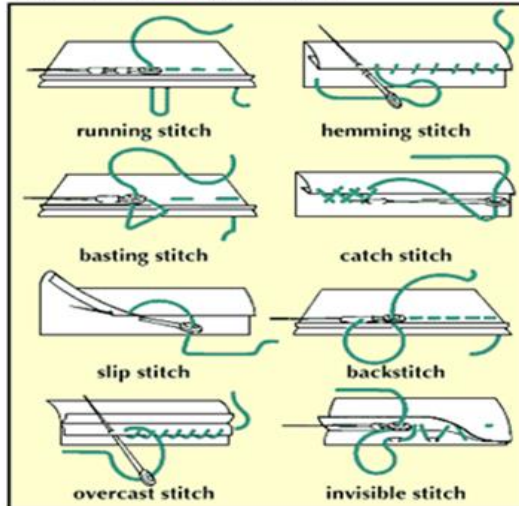
Textiles are highly adaptable and can be constructed to maximise different properties including a very high strength and weight ratio, which means less materials can be used to make strong and robust products.

Textiles are available in many different forms including rolls, yarns, and fibres. Some textiles can be very cheaply produced and some are extremely expensive, especially when using rare fibres and labour intensive techniques.

The categories of textile are:

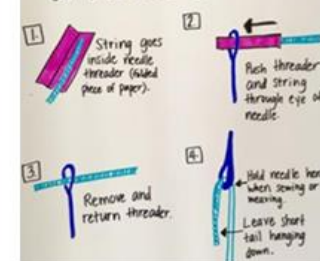
- Natural Fibres
- Synthetic Fibres
- Blended or Mixed Fibres
- Woven Fibres
- Non-woven Fibres
- Knitted Textiles

SOME BASIC SEWING STITCHES



Natural Fabrics		
Plant-based natural fibres	Characteristics	Uses
 Cotton	Soft and strong, absorbent, cool to wear and easily washable. Cotton fabrics can be given a brushed finish to increase their properties.	Most clothing, especially shirts, underwear and denim can be made from cotton. Also used for towels and bedsheets.
Animal-based natural fibres	Characteristics	Uses
 Wool	From fine and soft to thick and coarse, it is warm and naturally crease resistant. Can shrink. Often blended to add functionality.	Jumpers, coats, suits and accessories worn for warmth. Specialist wools are very soft and expensive. Felt products and carpets.
 Silk	Very soft and fine finish, gentle on skin, can feel cool in summer yet warm in winter, drapes well, absorbent, strong when dry (weaker when wet), tricky to wash, can crease easily and is usually expensive.	Luxury clothing including nightwear and underwear, soft furnishings, bed sheets, silk paintings and wall hangings.
Synthetic Fibres		
	Characteristics	Uses
 Polyester	Tough, strong, hard wearing, very versatile, holds colour well, non-absorbent so quick drying, machine washes well. Often blended with other fibres. Easily coloured.	Clothing, fleece garments, bedsheets, carpets, wadding, rope, threads, backpacks, umbrellas and sportswear.
 Polyamide (Nylon)	Good strength, hard wearing, non-absorbent, machine washes well, easily and frequently blended.	Clothing, ropes and webbings, parachutes and sports material. Used as a tough thread on garments.
 Elastane (LYCRA)	Added to fabric to enhance working properties, particularly to add stretch. Allows freedom of movement, quick drying, holds colour well, machine washable.	Sportswear, exercise clothing, swimsuits, hosiery, general clothing, surgical and muscular supports.
Blended and Mixed Fibres		
 Poly-cotton	More durable than pure cotton but not as breathable. Can be produced more cheaply than cotton alone. Many blends are available; 65% cotton 35% polyester to 50/50 are common.	General clothing, sheets and bedding. Can be used as an alternative to most cotton products.

How to Thread a Needle



Scales of Production

- One off:** when you make a unique item.
- Batch:** when you make a few/set amount.
- Mass:** when you make thousands.
- Continuous:** open ended production.

P2 Chapter 1: Forces

Knowledge organiser

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Friction and drag

- **Friction** is a force which will slow down a moving object due to two surfaces rubbing on one another
- The greater the friction, the faster an object will slow down, or the greater the force it will need to overcome the force of friction. For example, it is easier to push a block on ice than on concrete, as the ice is smoother and causes less friction

- When an object is moving through a fluid, either liquid or gas, the force which slows it down is known as **drag**
- The fluid particles will collide with the moving object and slow it down, meaning that more force is needed to overcome this
- Both drag and friction are **contact forces** as the two surfaces in friction, and the object and fluid particles in drag, come into contact with one another
- Both drag and friction are forces so they are measured in **Newtons (N)**



A solid moves through a gas.



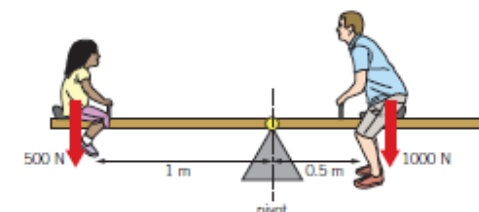
A solid moves through a liquid.

Turning forces

- A **moment** is the turning effect of a force, it is measured in Newton meters
- We can calculate a moment with the equation:

$$\text{moment (Nm)} = \text{force (N)} \times \text{distance from the pivot (m)}$$

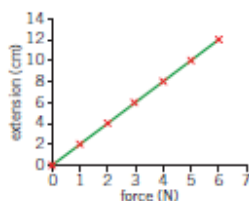
- The size of the moment will increase as the distance from the **pivot** or the size of the force increases
- When an object, such as a seesaw, is balanced, the clockwise and the anticlockwise moments will be equal and opposite, which is known as **equilibrium**
- When forces are equal and opposite to each other, there is no **resultant force**



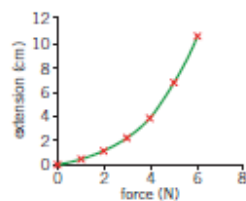
$$\begin{aligned} \text{clockwise moment} &= \text{force} \times \text{distance on the right} \\ &= 1000 \text{ N} \times 0.5 \text{ m} \\ &= 500 \text{ Nm} \\ \text{anticlockwise moment} &= \text{force} \times \text{distance on the left} \\ &= 500 \text{ N} \times 1 \text{ m} \\ &= 500 \text{ Nm} \end{aligned}$$

Hooke's law

- Some objects, like springs, can be stretched, the amount that they stretch is known as their **extension**
- A force needs to be applied to the spring for it to be stretched, we can achieve this by adding masses which exert the force weight
- A spring will continue to stretch until it passes its **elastic limit**
- If an object obeys **Hooke's law** it will have a **linear relationship**: if the force applied to the spring is doubled, the extension will double too
- If an object does not obey Hooke's law, it will not have a linear relationship



This graph shows how the extension of a spring changes as you pull it



This graph shows the relationship between force and extension

Gas pressure

- **Gas pressure** is caused by the particles of a gas colliding with the wall of the container which they are in
- The more often that the particles collide with the wall of the container, the higher the pressure of the gas will be
- Gas pressure can be increased by:
 - Heating the gas so the particles move more quickly and collide with the container with a higher energy
 - Compressing the gas so there are the same amount of particles within a smaller volume meaning that there are more collisions
 - Increasing the amount of particles within the same volume so there are more collisions
- **Atmospheric pressure** is the pressure which the air exerts on you all of the time, nearer the ground there are more particles weighing down on you so the pressure is greater
- The higher you go, the smaller the atmospheric pressure, this is because there will be less particles weighing down on you

Pressure in solids

- The pressure which is exerted on a solid is known as **stress**
- The greater the area over which the force is exerted over, the lower the pressure, this is why snowshoes have a large area to prevent you sinking into the snow
- **Pressure** can be calculated using the following equation:

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

Pressure in liquids

- Liquids are **incompressible**
- The particles in a liquid are already touching, meaning that there is little space between them to compress
- Liquids will transfer the pressure applied to them, this is seen in hydraulic machines
- As the ocean gets deeper, the pressure will increase, this is because the pressure depends on the weight of the water above
- The greater the number of water molecules above, the higher the pressure will be



Key terms

Make sure you can write definitions for these key terms.

air resistance atmospheric pressure contact force drag elastic limit equilibrium extension friction gas pressure Hooke's law incompressible
linear relationship moment newton pivot pressure resultant force stress

CHAPTER 8: FORCES KEYWORDS

	Keyword	Definition
1	Air resistance	The force on an object moving through the air (also known as drag)
2	Atmospheric pressure	The pressure caused by the weight of the air above a surface
3	Contact force	A force when 2 objects are touching
4	Drag	The force slowing down an object as it moves through a liquid or gas
5	Elastic limit	The point beyond which a spring will not return to its original length when the force is removed
6	Equilibrium	When the moments are equal and opposite
7	Extension	The amount of stretch in an object
8	Friction	A force which will slow down an object due to 2 surfaces rubbing on one another
9	Gas pressure	Caused by the particles of a gas colliding with the wall of a container
10	Hooke's Law	A law that says that if you double the force on an object, the extension will double
11	Incompressible	Cannot be compressed
12	Linear relationship	When 2 variables are graphed and show a straight line through the origin
13	Moment	A measure of the ability of a force to rotate an object about a pivot
14	Newton	Unit for measuring force (N)
15	Pivot	The point about which a lever or see-saw balances or rotates
16	Pressure	The ratio of force to surface area, in N/m^2 and how it causes stresses in solids
17	Resultant force	Single force which can replace all the forces acting on an object and have the same effect
18	Stress	The effect of a force applied to a solid $\text{Stress} = \text{force}/\text{area}$

Keyword	Definition	Retrieval Question	Retrieval Answer
Air resistance	The force on an object moving through the air (also known as drag)	What is the unit of measurement for a force?	Newtons (N)
Atmospheric pressure	The pressure caused by the weight of the air above a surface	What is friction?	A contact force between two moving objects
Contact force	A force when 2 objects are touching	When is friction greatest?	On a rough surface
Drag	The force slowing down an object as it moves through a liquid or gas	Name 2 drag forces	Water resistance and air resistance
Elastic limit	The point beyond which a spring will not return to its original length when the force is removed	When does drag occur?	When an object moves through water or air, pushing particles out of the way
Equilibrium	When the moments are equal and opposite	How do you calculate resultant force?	The difference between the two forces
Extension	The amount of stretch in an object	What 2 things can be happening to an object when its resultant force is zero?	Steady speed or not moving
Friction	A force which will slow down an object due to 2 surfaces rubbing on one another	What are the 2 things a force can do to an object?	Change the shape of an object or the direction it moves in
Gas pressure	Caused by the particles of a gas colliding with the wall of a container	What force does a solid provide to an object?	Reaction force
Hooke's Law	A law that says that if you double the force on an object, the extension will double	How is compression caused?	When forces squash an object
Incompressible	Cannot be compressed	How is tension caused?	When forces stretch an object
Linear relationship	When 2 variables are graphed and show a straight line through the origin	State Hooke's Law	When you double the force, the extension doubles
Moment	A measure of the ability of a force to rotate an object about a pivot	What is the elastic limit of a spring?	The point at which the spring will not go back to its original length when the force is removed
Newton	Unit for measuring force (N)	How do you measure the extension of a spring?	Using a ruler, apply weights to the spring and measure the extension
Pivot	The point about which a lever or see-saw balances or rotates	What is a moment?	The turning effect of a force

Keyword	Definition	Retrieval Question	Retrieval Answer
Pressure	The ratio of force to surface area, in N/m ² and how it causes stresses in solids	What is the unit of measurement for a moment?	Newton metres (Nm)
Resultant force	Single force which can replace all the forces acting on an object and have the same effect	State the equation for calculating a moment	Moment (Nm) = force (N) x perpendicular distance from the pivot (m)
Stress	The effect of a force applied to a solid Stress = force/area	What is a pivot?	The turning point
What causes liquid pressure?	Water molecules pushing on each other and on surfaces	What is the law of moments?	The sum of the clockwise moments is equal to the sum of the anticlockwise moments
What does incompressible mean?	Cannot be compressed	Describe what is meant by the centre of gravity	Where the weight of an object acts through a specific point
How does liquid pressure change as you go dive deeper in the ocean?	Increases the deeper you go	What is gas pressure?	The force that gases exert when they collide with the walls of a container
Describe why an object float	If up thrust balances the weight of an object	What happens to particles in gas when they are compressed?	They get closer together, collide more often and the pressure increases
Define up thrust	The pressure on the bottom of object that is submerged in water	How does atmospheric pressure change with altitude?	It decreases the higher up you go
What is the unit of measurement for stress?	Newtons per metre squared (N/m ²)	Where on Earth does air have the greatest density?	Near the ground
State the equation for calculating stress?	Stress (N/m ²) = force (N) ÷ area (m ²)	What is the equation to calculate fluid pressure?	Fluid pressure (N/m ²) = force (N) ÷ area (m ²)
What happens to the stress as the area of an object increases?	Decreases	In which direction does stress act?	Downwards (on the ground)

P2 Chapter 3: Energy

Knowledge organiser

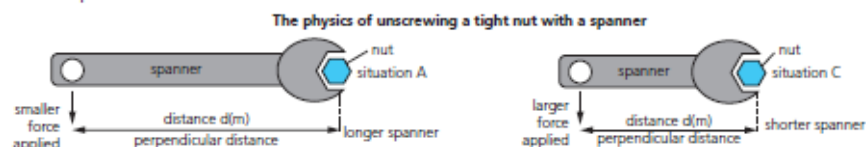
Activate
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Work

- In physics, **work done** is the energy transferred when a force is used to move an object a certain distance
- Like energy, work is measured in **Joules (J)**
- Work can be done in a range of situations e.g. lifting a book work is done against gravity, when you slide a book along a table work is done against friction
- We calculate work with the equation:

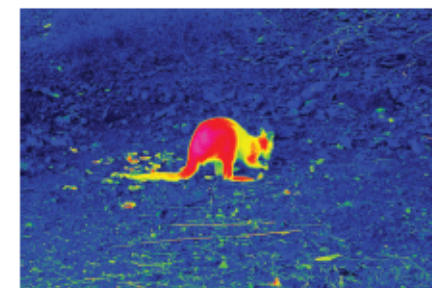
$$\text{work done (J)} = \text{force (N)} \times \text{distance moved (m)}$$

- A **simple machine** makes it easier to lift things, they reduce the force needed
- A **force multiplier** uses a smaller **input force** (what you apply) to generate a larger **output force** (what is created)
- If you increase the distance from the pivot, less input force is needed to be used for the same output force as before
- A **lever** is an example of a force multiplier, a longer lever will require a less input force than a shorter lever to produce the same output force



Radiation

- Radiation** is a method of transferring energy without the need for particles
- An example of radiation is thermal energy being transferred from the Sun to us through space (where there are no particles)
- This type of radiation is known as **infrared radiation**, it is a type of wave just like light
- The hotter an object is the more infrared radiation it will emit (give out)
- The amount of radiation emitted and absorbed depends on the surface of the object:
 - Darker matte surfaces absorb and emit more infrared radiation
 - Shiny and smooth surfaces absorb and emit less infrared radiation, instead reflecting this
 - The amount of infrared radiation being emitted can be viewed on a **thermal imaging camera**

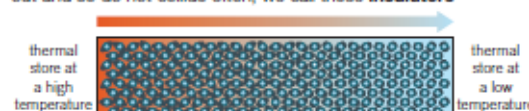


Energy and temperature

- The **temperature** of a substance is a measure of how hot or cold it is
- Temperature is measured with a **thermometer**, it has the units of degrees Celsius (°C)
- The **thermal energy** of a substance depends on the individual energy of all of the particles, it is measured in Joules (J)
- As all particles are taken into account, a bath of water at 30 °C would have more thermal energy than a cup of tea at 90 °C as there are many more particles
- The faster the particles are moving, the more thermal energy they will have
- When particles are heated they begin to move more quickly
- The energy needed to increase the temperature of a substance depends on:
 - the mass of the substance
 - what the substance is made of
 - how much you want to increase the temperature by

Conduction

- Conduction** is the transfer of thermal energy by the vibration of particles, it cannot happen without particles
- This means that every time particles collide they transfer thermal energy
- Conduction happens effectively in solids as their particles are close together and can collide often as they vibrate around a fixed point
- Metals are also good **thermal conductors** as they contain electrons which are free to move
- In conduction the thermal energy will be transferred from an area which has a high **thermal energy store** (high temperature) to an area where there is a low thermal energy store (low temperature)
- Gases and liquids are poor conductors as their particles are spread out and so do not collide often, we call these **insulators**



Convection

- Convection** is the transfer of thermal energy in a liquid or a gas, it cannot happen without particles
- As the particles near the heat source are heated they spread out and become less dense, this means that they will rise
- More dense particles will take their place at the bottom nearest the heat source creating a constant flow of particles
- This is known as a **convection current**
- Convection cannot happen in a solid as the particles cannot flow, they can only move around a fixed point



Keyterms

Make sure you can write definitions for these key terms.

conduction convection convection current force multiplier input force insulator infrared radiation lever output force simple machine temperature
thermometer thermal conductor thermal energy store thermal imaging camera work done

CHAPTER 8: ENERGY KEYWORDS

	Keyword	Definition
1	Conduction	Transfer of thermal energy by the vibration of particles.
2	Convection	Transfer of thermal energy when particles in a fluid rise
3	Convection current	The movement of heated fluids where hot fluid moves upwards, and cold fluid moves downwards
4	Force multiplier	A simple machine that uses a small input force to generate a large output force
5	Input force	The force you apply to make an object move or change shape
6	Insulator	Materials which do not allow thermal energy to pass through them.
7	Infrared radiation	The transfer of thermal energy without the need for particles
8	Lever	A type of machine which is a rigid bar that pivots about a point. It is a force multiplier
9	Output force	The force that is applied to the object moved by the machine
10	Simple machine	A machine such as a lever or pulley system which changes the size of the force by moving a force over a bigger or smaller distance
11	Temperature	A measure of how hot or cold a substance is
12	Thermometer	An instrument used to measure temperature
13	Thermal conductor	Thermal conductors contain electrons that are free to move
14	Thermal energy store	The energy store associated with an object's temperature
15	Thermal imaging camera	A device used to view, and amount of infrared radiation being emitted from an object
16	Work done	The amount of energy transferred when an object is moved over a distance $WD = \text{force} \times \text{distance}$

Keyword	Definition	Retrieval Question	Retrieval Answer
Conduction	Transfer of thermal energy by the vibration of particles.	What is meant by "work"?	When a force moves/deforms an object
Convection	Transfer of thermal energy when particles in a fluid rise	Give 2 examples of "doing work"	Lifting, pushing (any sensible answer)
Convection current	The movement of heated fluids where hot fluid moves upwards, and cold fluid moves downwards	State the equation to calculate work done?	Work done (J) = force (N) x distance moved (m)
Force multiplier	A simple machine that uses a small input force to generate a large output force	What is the unit of measurement for work done?	Joules (J)
Input force	The force you apply to make an object move or change shape	Give 2 examples of simple machines	Levers and pulleys
Insulator	Materials which do not allow thermal energy to pass through them.	Why is a lever described as a force multiplier?	The output force is bigger than the input force
Infrared radiation	The transfer of thermal energy without the need for particles	Define the term "temperature"	How hot or cold an object is
Lever	A type of machine which is a rigid bar that pivots about a point. It is a force multiplier	Which piece of scientific apparatus measures temperature?	Thermometer
Output force	The force that is applied to the object moved by the machine	What are the units of measurement for temperature?	Degrees Celsius ($^{\circ}\text{C}$)
Simple machine	A machine such as a lever or pulley system which changes the size of the force by moving a force over a bigger or smaller distance	What are the unit of measurement for energy?	Joules or Kilojoules
Temperature	A measure of how hot or cold a substance is	What happens to particles when an object is heated?	They vibrate or move around more
Thermometer	An instrument used to measure temperature	In which direction is the transfer of energy as an object cools down?	From the hot object to a cooler object
Thermal conductor	Thermal conductors contain electrons that are free to move	Describe 2 ways energy can be transferred	Conduction, convection, or radiation
Thermal energy store	The energy store associated with an object's temperature	State what an insulator is?	A material that does not allow energy to be transferred through it easily

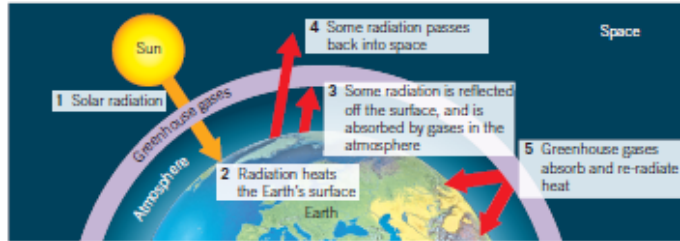
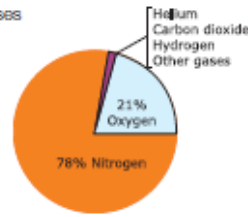
Keyword	Definition	Retrieval Question	Retrieval Answer
Thermal imaging camera	A device used to view, and amount of infrared radiation being emitted from an object	Describe how energy is transferred in conduction?	Particles transfer energy by colliding with other particles when they vibrate
Work done	The amount of energy transferred when an object is moved over a distance $WD = \text{force} \times \text{distance}$	Describe how energy is transferred in convection?	Particles move further apart, become less dense and rise transferring energy
		What is infrared radiation?	A type of (electromagnetic) wave that transfers heat energy
		What type of materials are good absorbers of infrared radiation?	Dark, matt surface
		What type of materials are good reflectors of infrared radiation?	Shiny or light surfaces
		Name 2 sources of infrared radiation	Sun, fire (any sensible answer)
		What do we use to detect infrared radiation?	Thermal imaging camera

P2 Chapter 7: Earth
Knowledge organiser



The atmosphere

- The air around us all of the time is known as the **atmosphere**, it is made up of a mixture of gases
- When the Sun heats the Earth's surface, some of the radiation is absorbed and some is reflected back into space
- Some of the gases in the atmosphere absorb radiation that is about to be reflected into space, this keeps the Earth at a warmer temperature than it would be without the atmosphere, this is needed as otherwise it would be too cold for life
- The gases in the atmosphere which absorb and trap this radiation are known as **greenhouse gases**, the most commonly known greenhouse gases are carbon dioxide and methane

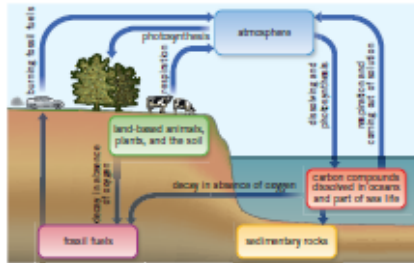


Global warming

- Global warming** is the gradual increase in temperature of the Earth
- This is closely linked to the rise in carbon dioxide levels in the atmosphere

The carbon cycle

- The **carbon cycle** is the processes by which carbon is naturally transferred to different stores through a range of natural processes
- Carbon is released into the atmosphere through **combustion of fossil fuels**, and animal **respiration**
- It is then reabsorbed by plants during **photosynthesis**



Climate change

- Long term changes to weather patterns are known as **climate change**
- This can cause the ice caps to melt, leading to sea levels rising and flooding of low level land
- Graphs alone cannot confirm that humans are the cause, but the majority of scientists now believe that human activity is a very likely cause
- We can help to prevent climate change by:
 - Using renewable energy resources
 - Using cars less
 - Buying and wasting less resources

Extracting metals

- Metals are a **natural resource**, with most being found joined with other elements in compounds
- Naturally occurring metals and their compounds are known as **minerals**
- An **ore** is a naturally occurring rock which contains enough of a mineral to be worth extracting
- An example of an ore is Bauxite, which contains aluminium hydroxide

- When metals are extracted they first have to be separated from other minerals in the ore, then they need to undergo a chemical reaction to separate them from the other element that they are joined to in a compound
- If a metal is below carbon in the reactivity series, it can be extracted by reacting it with carbon in a displacement reaction
- As carbon is more reactive it will take the place of the metal in the compound, leaving the metal on its own:
 - $\text{carbon} + \text{metal oxide} \rightarrow \text{metal} + \text{carbon dioxide}$
 - $\text{carbon} + \text{copper oxide} \rightarrow \text{copper} + \text{carbon dioxide}$
- If the metal is above carbon in the reactivity series, **electrolysis** can be used, this involves separating the metal by using electricity

Reactivity series

- magnesium
- aluminium
- carbon
- zinc
- iron
- lead
- copper

Recycling

- Recycling** is the collecting and processing of materials that have been used so that the resources can be used again
- Recycling can have both advantages and disadvantages:

Advantages	Disadvantages
<ul style="list-style-type: none"> Resources will last longer It uses less energy than extracting new materials It reduces waste and pollution 	<ul style="list-style-type: none"> Separating rubbish can be seen as a nuisance The lorries collecting recycling produce pollution Some materials are easier to recycle than others

Keyterms Make sure you can write definitions for these key terms.

- atmosphere carbon cycle climate change combustion electrolysis fossil fuel global warming greenhouse gas mineral
 natural resource ore photosynthesis recycling respiration

CHAPTER 8: EARTH KEYWORDS

	Keyword	Definition
1	Atmosphere	The mixture of gases found in the air around us.
2	Carbon cycle	The process by which carbon is naturally transferred from one store to another
3	Climate change	Long term changes to weather patterns
4	Combustion	The burning of a fuel in oxygen
5	Electrolysis	The extraction of metal from a compound using electricity
6	Fossil fuel	A chemical energy store formed from the remains of organisms
7	Global warming	The gradual increase in the temperature of the Earth
8	Greenhouse gas	Gases in the atmosphere that trap radiation.eg methane and carbon dioxide
9	Mineral	A naturally occurring mineral or compound
10	Natural resources	Resources that are not man-made and can be found in the environment
11	Ore	A naturally occurring rock which has a mineral content worth extracting
12	Photosynthesis	The process of plants transferring light energy to chemical energy
13	Recycling	The collecting and processing of materials so they can be used again
14	Respiration	The process by which organisms transfer chemical energy to useable energy stores

Keyword	Definition	Retrieval Question	Retrieval Answer
Atmosphere	The mixture of gases found in the air around us.	What is the definition of global warming?	The increase in air temperature at the surface of the Earth
Carbon cycle	The process by which carbon is naturally transferred from one store to another	What is the definition of greenhouse effect?	The transfer of energy from the Sun to the thermal energy store of the gases in the Earth's atmosphere
Climate change	Long term changes to weather patterns	Name 2 greenhouse gases	Carbon dioxide and methane
Combustion	The burning of a fuel in oxygen	Name 4 of the gases found in Earth's atmosphere	Nitrogen, oxygen, carbon dioxide, argon
Electrolysis	The extraction of metal from a compound using electricity	Define the term "climate change"	Lasting change in long term weather patterns over a period of time
Fossil fuel	A chemical energy store formed from the remains of organisms	Name 3 ways human activities contribute to the addition of carbon to the atmosphere resulting in climate change	Burning fossil fuels, deforestation, farming
Global warming	The gradual increase in the temperature of the Earth	Describe 2 pieces of evidence supporting the theory relating to climate change	Increased carbon dioxide levels, carbon dioxide and methane molecules trap heat
Greenhouse gas	Gases in the atmosphere that trap radiation. eg methane and carbon dioxide	Give 2 ways humans can reduce their impact on climate change	Use renewable sources of energy, use less cars, buy and waste less
Mineral	A naturally occurring mineral or compound	What is a mineral?	Naturally occurring metals joined to other elements in compounds

Keyword	Definition	Retrieval Question	Retrieval Answer
Natural resources	Resources that are not man-made and can be found in the environment	What is a metal ore?	Naturally occurring rocks that contains enough mineral to make it worth getting the mineral
Ore	A naturally occurring rock which has a mineral content worth extracting	How are metals extracted from their ores?	Heating with carbon or electrolysis
Photosynthesis	The process of plants transferring light energy to chemical energy	Name 3 metals extracted using carbon	Zinc, iron, lead, copper
Recycling	The collecting and processing of materials so they can be used again	Describe the 2 stages of extracting iron from its ore	Separating the ore from other compounds, using chemical reactions to extract iron from iron oxide
Respiration	The process by which organisms transfer chemical energy to useable energy stores	What is electrolysis?	Splitting up a compound using electricity
		Where do all the materials and resources we use come from?	Earth's crust, atmosphere, or oceans
		What is meant by the term "recycling"?	Collecting and processing materials that have been used
		Why is the recycling of materials encouraged?	Resources will last longer, uses less energy than using new materials, reduces waste and pollution
		State 2 disadvantages of recycling	Lorries collecting it use fuel and create pollution, difficult to separate,

B2 Chapter 9: Ecosystems

Knowledge organiser



Respiration

- Respiration is the process in which energy is released from the molecules of food which you eat
 - Respiration happens in the mitochondria of the cell
 - Aerobic respiration** involves oxygen, it is more efficient as all of the food is broken down to release energy
 $\text{glucose} + \text{oxygen} \rightarrow \text{carbon dioxide} + \text{water}$
 - The glucose is transported to the cells in the blood **plasma**
 - The oxygen is transported to the cells in **red blood cells**, by binding with **haemoglobin**
 - Carbon dioxide is a waste product and is transported from the cells to the lungs to be exhaled
-
- Anaerobic respiration** is a type of respiration which does not use oxygen, it is used when the body cannot supply the cells with enough oxygen for aerobic respiration
 - Anaerobic respiration releases less energy than aerobic respiration
 $\text{glucose} \rightarrow \text{lactic acid} + \text{carbon dioxide}$
 - The **lactic acid** produced through anaerobic respiration can cause muscle cramps
 - Lactic acid will build up if there is not enough oxygen present in the blood supply to break it down. This is known as an **oxygen debt**

Fermentation

- Fermentation** is a type of anaerobic respiration which occurs in yeast
- Instead of producing lactic acid, yeast produces ethanol, which is a type of alcohol
 $\text{glucose} \rightarrow \text{ethanol} + \text{carbon dioxide}$
- This process can be used to form alcohol to drink or to allow bread and cakes to rise

Plant minerals

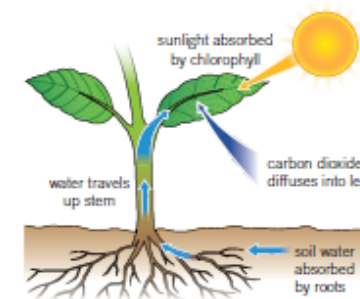
Plants need minerals for healthy growth, if they do not have enough of these minerals this is known as a **mineral deficiency**

Mineral	What is It used for?	What happens if there is not enough?
nitrates (contain nitrogen)	healthy growth	poor growth and older leaves yellow
phosphates (contain phosphorus)	healthy roots	poor growth, younger leaves look purple
potassium	healthy leaves and flowers	yellow leaves with dead patches
magnesium	making chlorophyll	leaves will turn yellow

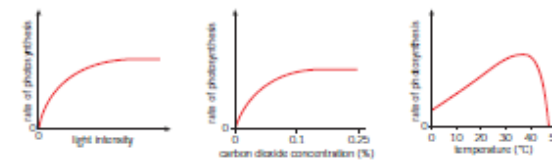
Fertilisers can be used to stop plants from suffering with mineral deficiencies

Photosynthesis

- Photosynthesis** is the process which occurs in the chloroplasts to produce glucose using sunlight
 $\text{glucose} + \text{carbon dioxide} \rightarrow \text{glucose} + \text{oxygen}$
- Any organism that can use photosynthesis to produce its own food is known as a **producer**, these are not just limited to plants but can include other organisms such as **algae**

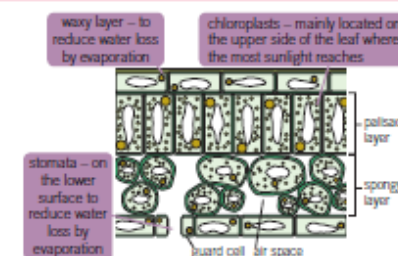


- The rate of photosynthesis can be affected by:
 - Light intensity** – the higher the light intensity the higher the rate of photosynthesis up to a point
 - Carbon dioxide concentration** – the higher the carbon dioxide concentration the higher the rate of photosynthesis up to a point
 - Temperature** – the optimum temperature is the temperature at which photosynthesis occurs at the highest rate, before and after this the rate will be less



Leaves

- To best adapt for photosynthesis leaves have a number of adaptations
- They are thin to allow the most light through
- There is a lot of **chlorophyll** to absorb light
- They have a large surface area to absorb as much light as possible



Key terms

Make sure you can write definitions for these key terms.

aerobic respiration algae anaerobic respiration chlorophyll mineral deficiency fermentation fertiliser haemoglobin lactic acid magnesium
 nitrates oxygen debt phosphates photosynthesis plasma potassium producer red blood cells

CHAPTER 8: ECOSYSTEMS KEYWORDS

	Keyword	Definition
1	Aerobic respiration	The process by which organisms use oxygen to transfer the energy in a fuel into chemical energy
2	Algae	A single celled plant
3	Anaerobic respiration	The process by which organisms transfer the energy in a fuel into chemical energy, but in the absence of oxygen
4	Chlorophyll	The green pigment found in plants which absorbs light during photosynthesis
5	Mineral deficiency	A condition in organisms where the concentration of a mineral is lower than it should be and so impairs the function of the organism
6	Fermentation	A type of anaerobic respiration in which glucose is converted to ethanol, carbon dioxide and energy
7	Fertiliser	Chemicals containing minerals that plants need to be healthy
8	Haemoglobin	The substance in blood that carries oxygen around the body
9	Lactic acid	An acid produced by animals during anaerobic respiration
10	Magnesium	An element essential for healthy plant growth. It is used to make chlorophyll
11	Nitrates	Minerals containing nitrogen, used by plants to make protein
12	Oxygen debt	Extra oxygen required after anaerobic respiration to break down lactic acid
13	Phosphates	Minerals containing phosphorus, used by plants to form healthy roots
14	Photosynthesis	The process plants and algae use light energy to make glucose.
15	Plasma	A liquid that transports blood cells and other materials around the body
16	Potassium	A mineral needed by plants for healthy leaves and flowers
17	Producer	The plant in the food chain that uses light energy and photosynthesis to produce glucose
18	Red blood cells	Blood cells that transport oxygen around the body

Keyword	Definition	Retrieval Question	Retrieval Answer
Aerobic respiration	The process by which organisms use oxygen to transfer the energy in a fuel into chemical energy	Which 2 substances react in Aerobic Respiration?	Glucose and oxygen
Algae	A single celled plant	What is the word equation for Aerobic Respiration?	Glucose + oxygen --> carbon dioxide + water (+ energy)
Anaerobic respiration	The process by which organisms transfer the energy in a fuel into chemical energy, but in the absence of oxygen	How are the substances required for Aerobic Respiration transported around the body?	Oxygen is carried by red blood cells, glucose dissolves in the plasma
Chlorophyll	The green pigment found in plants which absorbs light during photosynthesis	What is the main waste product of Aerobic Respiration?	Carbon dioxide
Mineral deficiency	A condition in organisms where the concentration of a mineral is lower than it should be and so impairs the function of the organism	Where in the cell does Aerobic Respiration take place?	Mitochondria
Fermentation	A type of anaerobic respiration in which glucose is converted to ethanol, carbon dioxide and energy	Define Anaerobic Respiration	Respiration that does not use oxygen
Fertiliser	Chemicals containing minerals that plants need to be healthy	What is the word equation for Anaerobic Respiration in animals?	Glucose --> lactic acid (+ energy)
Haemoglobin	The substance in blood that carries oxygen around the body	Give 2 reasons animals prefer to respire Aerobically?	It transfers more energy, lactic acid causes painful cramps in muscles
Lactic acid	An acid produced by animals during anaerobic respiration	Name the process that uses respiration in baking and brewing?	Fermentation
Magnesium	An element essential for healthy plant growth. It is used to make chlorophyll	Define Biotechnology	The use of biological processes or organisms to create useful products
Nitrates	Minerals containing nitrogen, used by plants to make protein	What is the word equation for Fermentation?	Glucose --> ethanol + carbon dioxide (+ energy)
Oxygen debt	Extra oxygen required after anaerobic respiration to break down lactic acid	Which microorganism is used in fermentation?	Yeast
Phosphates	Minerals containing phosphorus, used by plants to form healthy roots	How are the products of fermentation used in the baking and brewing industries?	Baking - carbon dioxide helps the bread rise, brewing - ethanol produced is used in alcoholic drinks

Keyword	Definition	Retrieval Question	Retrieval Answer
Photosynthesis	The process plants and algae use light energy to make glucose.	What is the purpose of photosynthesis?	To provide plants with food
Plasma	A liquid that transports blood cells and other materials around the body	What is the word equation for photosynthesis?	Carbon dioxide + water --> glucose + oxygen
Potassium	A mineral needed by plants for healthy leaves and flowers	Where in the plant cell does photosynthesis occur?	Chloroplasts in the leaf cells
Producer	The plant in the food chain that uses light energy and photosynthesis to produce glucose	What is the role of chlorophyll?	Green pigment that uses light for the sun needed in photosynthesis
Red blood cells	Blood cells that transport oxygen around the body	How do gases enter and leave the leaf?	Through tiny holes on the underside of the leaf (stomata)
		In which plant tissues does the most photosynthesis occur?	Leaves
		Where are the most stomata found on the leaf?	On the underside of the leaf
		What is the function of the guard cells in the leaf?	Open and close stomata
		What substance is tested for in the leaf?	Starch
		What colour does Iodine become if the leaf has been photosynthesising?	Blue-black
		What is the function of the ethanol in the experiment?	To remove all the chlorophyll
		Which 3 factors affect the rate of photosynthesis?	Light intensity, carbon dioxide and temperature
		Define fertiliser	Chemicals that contain minerals to prevent mineral deficiency in plants
		Why does a plant need nitrates?	For healthy growth
		Why does a plant need magnesium?	For making chlorophyll
		Why does a plant need phosphorus?	For healthy roots
		Why does a plant need potassium?	For healthy leaves and flowers
		How do minerals enter and move through the plant?	They are absorbed into root hair cells and transported around the plant in xylem tubes

B2 Chapter 8: Organisms

Knowledge organiser



Gas exchange and breathing

- Gas exchange** is the process of taking in oxygen and giving out carbon dioxide
- This occurs in the **respiratory system**
- The proportions of gases in the air we **inhale** and **exhale** changes due to using oxygen in **respiration** and producing carbon dioxide

The digestive system

- mouth**
- salivary gland** - this produces a digestive juice, which is added into the mouth
- oesophagus**
- liver** - this produces bile, which helps digestion
- stomach** - this adds acids and it is where digestion occurs
- pancreas** - this produces a digestive juice, which is added into the small intestine
- small intestine** - here digestion is completed, and absorption of soluble food occurs
- large intestine** - water is absorbed from the undigested food, which then produces faeces
- rectum**
- anus**

Enzymes

- Enzymes** are biological **catalysts**, they speed up the digestion of **nutrients**
- Each enzyme is specific to each nutrient
- The way the enzyme and nutrient bind with each other is called a **lock and key model**
- Carbohydrases** break **carbohydrates** down into simple sugars
- Proteases** break **proteins** down into amino acids
- Lipase** breaks **lipids** (fats) down into fatty acids and glycerol

What happens when you breathe in and out

when you breathe in (inhale)	<ul style="list-style-type: none"> muscles between the ribs contract ribs are pulled up and out diaphragm contracts and flattens volume of the chest increases pressure inside the chest decreases air rushes into the lungs
when you breathe out (exhale)	<ul style="list-style-type: none"> muscles between ribs relax ribs are pulled in and down diaphragm relaxes and moves up volume in the chest decrease pressure inside the chest increases air is forced out of the lungs

Drugs

- Drugs** are chemicals that affect the way that our body works
- Medicinal drugs** are used in medicine, they benefit health
- If medicinal drugs are not taken in the correct way they can harm health
- Examples include antibiotics and pain killers
- Recreational drugs** are taken by people for enjoyment
- Recreational drugs normally have no health benefits and can be harmful for health
- Examples include alcohol and tobacco
- Drug addiction** is when your body gets so used to a drug, it feels it cannot cope without it
- If someone who has an addiction stops taking the drug, they will experience **withdrawal symptoms**

Nutrients

- A **balanced diet** involves eating the right amount of nutrients for your body to function
- Not eating enough of a nutrient means you have an unbalanced diet, and this can lead to a **deficiency**

Nutrient	Role in your body
carbohydrates	main source of energy
lipids	fats and oils provide energy
proteins	growth and repair of cells and tissues
vitamins and minerals	essential in small amounts to keep you healthy
water	needed in all cells and body fluids
fibre	provides bulk to food to keep it moving through the gut

Key terms Make sure you can write definitions for these key terms.

- addiction balanced diet carbohydrate carbohydrases catalyst deficiency drug enzyme exhale fibre gas exchange inhale lipid medicinal drug mineral nutrient protease protein recreational drug respiration respiratory system vitamin withdrawal symptoms

CHAPTER 8: ORGANISMS

	Keyword	Definition
1	Addiction	A need to keep taking a drug to feel normal
2	Balanced diet	Eating food containing the right nutrients in the correct amounts
3	Carbohydrate	Nutrients that provide the body's main source of energy
4	Carbohydrase	Enzyme that breaks down carbohydrates into smaller sugar molecules
5	Catalyst	Substances that speed up chemical reactions but are not unchanged at the end
6	Deficiency	A lack of minerals that causes poor health
7	Drug	Chemical substance that affects the way your body works
8	Enzyme	Substances that speed up the chemical reactions of digestion
9	Exhale	Breathing out, removing carbon dioxide
10	Fibre	Food matter that supports movement through the intestines and prevents constipation
11	Gas exchange	The transfer of gases between an organism and its environment
12	Inhale	Breathing in, to take in oxygen
13	Lipid	A type of fat
14	Medicinal drug	A drug that has a medicinal benefit to your health
15	Mineral	Essential nutrient needed in small amounts to keep healthy
16	Nutrient	Essential substances that your body needs to survive, provided by food
17	Protease	Enzyme that breaks down proteins into amino acids
18	Protein	Nutrient required for growth and repair
19	Recreational drug	Drug taken for enjoyment
20	Respiration	Chemical reaction where energy is released from glucose
21	Respiratory system	Organ system which replaces oxygen and removes carbon dioxide from the blood
22	Vitamin	Essential nutrients needed in small amounts for health
23	Withdrawal symptoms	Unpleasant symptom a person with a drug addiction suffers from when they stop taking the drug

Keyword	Definition	Retrieval Question	Retrieval Answer
Addiction	A need to keep taking a drug to feel normal	Which gases are exchanged in the lungs?	Oxygen and carbon dioxide
Balanced diet	Eating food containing the right nutrients in the correct amounts	What is the pathway air takes from the mouth to the lungs?	Nose/mouth, trachea, bronchus, bronchiole, alveolus, blood
Carbohydrate	Nutrients that provide the body's main source of energy	What is the composition of inhaled air?	79% nitrogen, 21% oxygen, 0.04% carbon dioxide
Carbohydrase	Enzyme that breaks down carbohydrates into smaller sugar molecules	What is the composition of exhaled air?	79% nitrogen, 16% oxygen, 4% carbon dioxide
Catalyst	Substances that speed up chemical reactions but are not unchanged at the end	Explain how oxygen travels to every cell in the body?	It is carried by the blood
Deficiency	A lack of minerals that causes poor health	Which large flat sheet of muscle contracts and relaxes during breathing?	Diaphragm
Drug	Chemical substance that affects the way your body works	Describe the pressure changes during inhalation?	Pressure decreases drawing air into your lungs
Enzyme	Substances that speed up the chemical reactions of digestion	Describe the pressure changes during exhalation?	Pressure increases pushing air out of your lungs
Exhale	Breathing out, removing carbon dioxide	What is breathing rate?	The number of breaths (in and out) taken every minute
Fibre	Food matter that supports movement through the intestines and prevents constipation	State one thing that can affect your lung volume?	Smoking, asthma (other respiratory diseases)
Gas exchange	The transfer of gases between an organism and its environment	Define the term "drug"?	Chemical substances that affect the way your body works
Inhale	Breathing in, to take in oxygen	What is meant by the term medicinal drug?	Drugs that are used in medicine/benefit your health in some way
Lipid	A type of fat	What is meant by the term recreational drug?	Drugs that people take for enjoyment, to help them relax
Medicinal drug	A drug that has a medicinal benefit to your health	Why can you become addicted to drugs?	Your body becomes used to the changes caused by the drug/it becomes dependent on it
Mineral	Essential nutrient needed in small amounts to keep healthy	State 2 medicinal drugs	Paracetamol, antibiotics (any sensible answer)
Nutrient	Essential substances that your body needs to survive, provided by food	State 2 recreational drugs	Alcohol, tobacco (any sensible answer)

Keyword	Definition	Retrieval Question	Retrieval Answer
Protease	Enzyme that breaks down proteins into amino acids	State 2 illegal drugs	Heroin, cocaine, cannabis, ecstasy (any sensible answer)
Protein	Nutrient required for growth and repair	What affect does a depressant drug have on the body?	It slows down your body's reactions
Recreational drug	Drug taken for enjoyment	What drug does alcohol contain?	Ethanol
Respiration	Chemical reaction where energy is released from glucose	Which part of the body is damaged by alcohol?	The liver
Respiratory system	Organ system which replaces oxygen and removes carbon dioxide from the blood	What are the 4 risks of drinking whilst pregnant?	Miscarriage, stillbirth, premature birth, and low birthweight
Vitamin	Essential nutrients needed in small amounts for health	What are the 4 hazards to health linked to smoking and tobacco smoke?	Breathing problems, cancer, heart attacks and strokes
Withdrawal symptoms	Unpleasant symptom a person with a drug addiction suffers from when they stop taking the drug	What is passive smoking?	Breathing in other people's smoke
Describe how you would carry out a test for fat	Rub food onto filter, which goes translucent if it contains fat	What are the 3 main substances in cigarettes?	Tar, nicotine, and carbon monoxide
Describe how you would carry out a test for protein	Add copper sulfate solution to a food solution, followed by sodium hydroxide, turning purple if it contains protein	What is the addictive chemical in cigarettes?	Nicotine
Give 2 safety precautions you would take when performing food tests	Wear safety goggles, clean up spillages, do not mix chemicals	What are the 6 types of nutrients our bodies need?	Carbohydrates, lipids (fats), protein, vitamins, minerals, and fibre
What happens to your body if you eat too much food?	You can become overweight and/or obese	What is the role of carbohydrate in the body?	Provide energy
What disease is caused by a deficiency of vitamin C?	Scurvy (bleeding gums/teeth can fall out)	What is the role of protein in the body?	Growth and repair
What disease is caused by a deficiency of vitamin D?	Rickets' (where your bones become weak)	What is the role of fat in the body?	Provide energy
Which vitamin deficiency causes night blindness?	Vitamin A	What is the role of vitamins and minerals in the body?	Keep you healthy