

Hartismere School



Knowledge Booklet 2026 - 2027
Year 9



Name: _____

Form: _____

What this booklet is for

Your teachers have selected some of the most important and useful knowledge you need to succeed in your subjects. They are in this booklet! Of course you will cover lots of other things in your lessons, but the knowledge in this booklet will help you to learn more effectively throughout your time at Hartismere.

When you will use this booklet

You will use this booklet in a lesson where you may have a cover teacher, for some homework, at the start of lessons and to revise for tests and quizzes.

You can also use this booklet to go above and beyond your school work. Your teachers have made suggestions for places you can look and things to do to really test your brain! These are in the booklet under the 'Sharp Minds' sections.

How you will use this booklet

Each subject has a section with the important things you need to know. You are going to learn how to quiz yourself so that the things you need to know stay in your memory. Using 'look, cover, write, check' is an excellent way to remember information.

How will you do this?

1. Choose a subject (unless your teacher has chosen it for you).
2. Choose no more than 5 words or terms. (If there are diagrams, treat each one as one thing)
3. **Read** the words and say them over and over again in your head (without saying them aloud) for 2 - 3 minutes.
4. Now turn to your practice pages (at the back of this booklet) or use your rough book or paper. Now **write down** as many words and definitions as you can remember in box 1 (or draw the diagram if that's what you've chosen).
5. Uncover the words or terms and **check** your have spelled them correctly and your definitions are right. Make any changes in a different colour.
6. Spend 2-3 minutes reading the words again and saying them in your head.
7. Now **cover up** box 1 and write out the words again in box 2. (This step is very important).
8. Now look at your work in box 2. Check you have got them right. Check your spelling. Make any changes in a different colour.
9. **Repeat** this process until you have got them all right. If you run out of space, use your rough book or paper. You will need to show your tutor the practice you have been doing.

Subject list

Page number	Subject
3-4	Art
5-6	Biology
7-8	Chemistry
9	Computer Science
10-11	Drama
12-14	English
15-17	French
18-19	Geography
20-23	History
24-26	Maths
27-28	Music
29-32	PE
33-34	Physics
35-36	Religious Studies
37-38	Science
39-41	Spanish
42-46	Self-quizzing pages
47	Hart points record for 'Sharp Minds'

Sharp Minds

For almost every subject, you'll see a 'Sharp Minds' section like the one below. Your teachers have given you suggestions of things you can do to go above and beyond in your subjects. Which ones you do is up to you, but you should record them on page 47 and show your tutor. You'll get Hart points and a reward if you complete ten or more.



Sharp minds: where to look

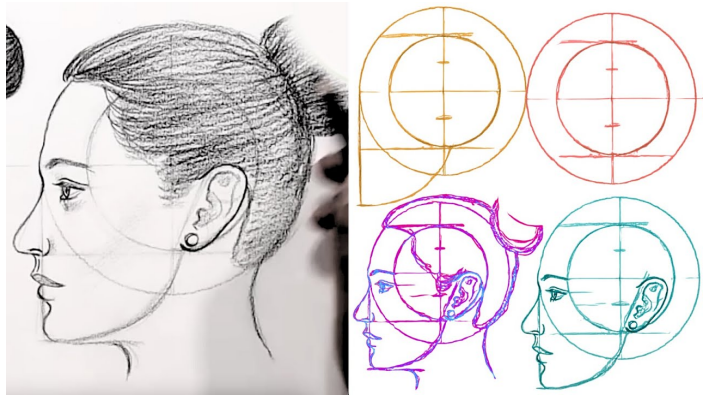
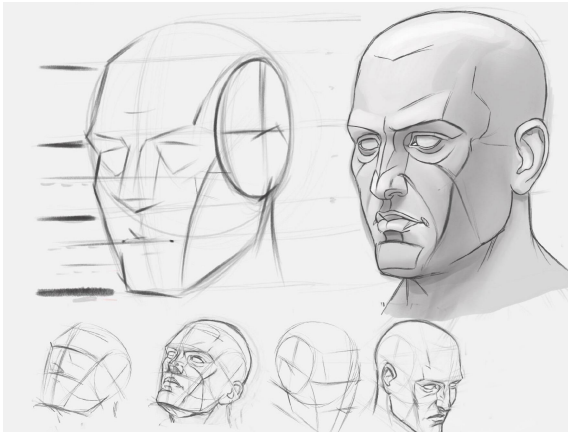
- Your teachers have made suggestions of all sorts of interesting things to do and places to explore.
- If there are links to websites, you can find this booklet on our school website under 'Sharp Minds'

Art

	Term or word	Definition
1	burnish	The act of rubbing greenware (clay) with any smooth tool to polish it, and tighten the surface.
2	genre	Often refers to different types of art work having a particular form, content, technique i.e. still life genre, a realistic style of painting using everyday life as subject material.
3	carving	A technique used by sculptors using tools such as chisels and files to cut or scrape away from a solid material such as stone or wood.
4	horizon line	Refers to the eye level used in perspective.
5	medium	Can refer to both the type of art (painting, sculpture, printmaking) as well as the materials an artwork is made from.
6	photorealism	A genre of art that encompasses painting, drawing and other graphic media, in which an artist studies a photograph and then attempts to reproduce the image as realistically as possible in another medium.
7	leatherhard	When clay loses moisture and plasticity it becomes leather or cheese hard. It will bend without cracking, can be easily cut and joined with slip, but will retain a given shape.
8	montage	An assembly of images that relate to each other in some way to create a single work or part of a work of art.
9	conceptual	An art form in which the underlying idea or concept and the process by which it is achieved are more important than any tangible product.
10	pigment	A colouring substance made from plants, earth, or minerals and may include other synthetic elements. When mixed with binders it becomes paint, ink or crayon.
11	bleeding	Describes the action of one colour running into another. Most applicable to watercolour where a second or third colour can be dropped onto an already applied wash while wet.
12	firing	Heating pottery or sculpture in a kiln or open fire to bring the clay to maturity.
13	sources	Sources can include such references as the work of artists, craftspeople, designers and/or makers, the built environment, the natural world, objects and/or artefacts, as well as performance, music, text, the moving image, customs, traditions and issues.
14	frottage	The process of making rubbings through paper of objects or textures underneath.
15	Pop art	An art movement that emerged in the 1950s in response to advertising and popular culture and flourished in the 1960s in America and Britain, drawing inspiration from sources in popular and commercial culture such as advertising, Hollywood movies and pop music.

Art continued.

Practise these shapes and forms

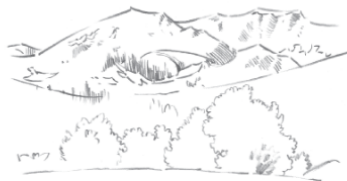


DRAWING PRACTICE

When drawing landscapes, it's important to be patient. Observe your subjects, reducing them to the most basic angles, lines, and shapes. When you begin to draw, follow the same process each time. First sketch some simple lines, and then refine the shapes and add details. Finally, add the rest of the details and shading.



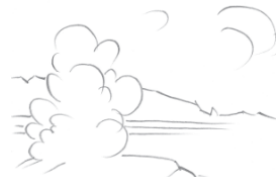
Notice how the vertical and diagonal shading lines create surface planes. The vertical lines make a flat surface, while the diagonal ones produce the slanting mountainsides.



The final sketch shows more details and provides a good study of line variation.



The thin, vertical strokes communicate tree shapes; uneven strokes create the full bushes; and uniform, angled lines bring out the mountain planes.



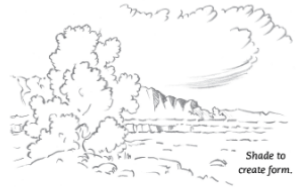
No matter the subject, start each drawing by sketching general shapes and lines.



Refine the shapes.



Begin adding details.



Shade to create form.



Add final details. Keep your shading simple.



Sharp minds in art: where to look

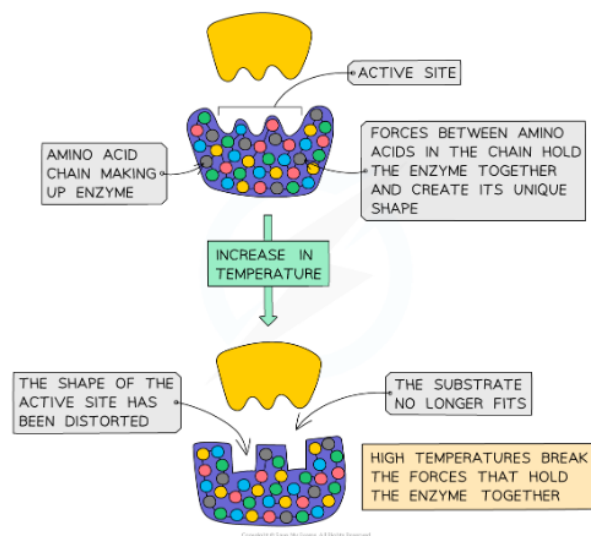
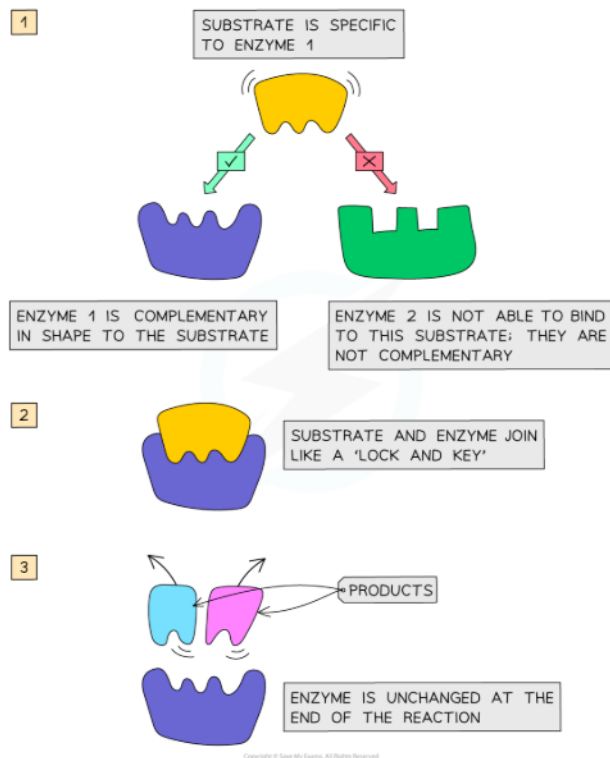
Pop Art - <https://www.tate.org.uk/art/art-terms/p/pop-art>

Portraits - <https://www.npg.org.uk> <https://www.youtube.com/@RapidFireArt>

Careers in art - <https://www.studentartguide.com/articles/art-careers-list>

Biology

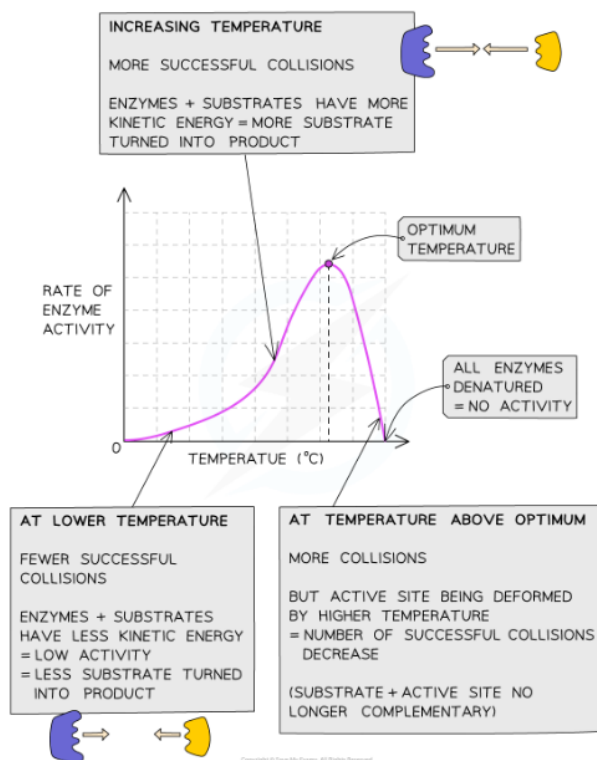
Memorise each diagram by using 'look, cover, write, check'.



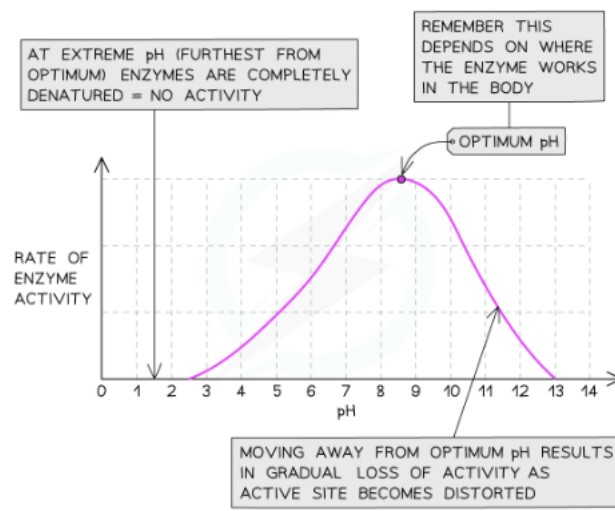
Biology

Enzymes have complementary shaped active sites to their substrates. An enzyme is denatured when the shape of the active site is changed (normally by heating) and is then no longer complementary to the substrate.

The effect of temperature on enzyme activity diagram

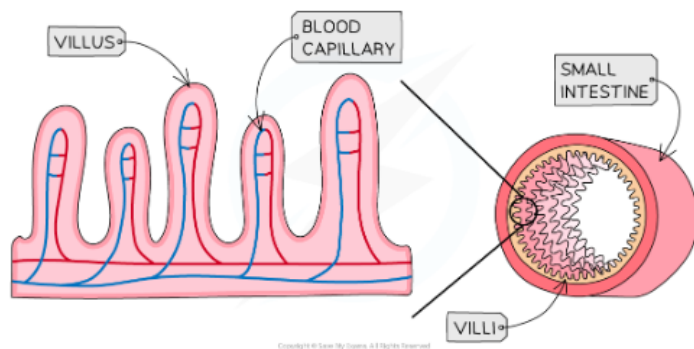


The effect of pH on enzyme activity diagram



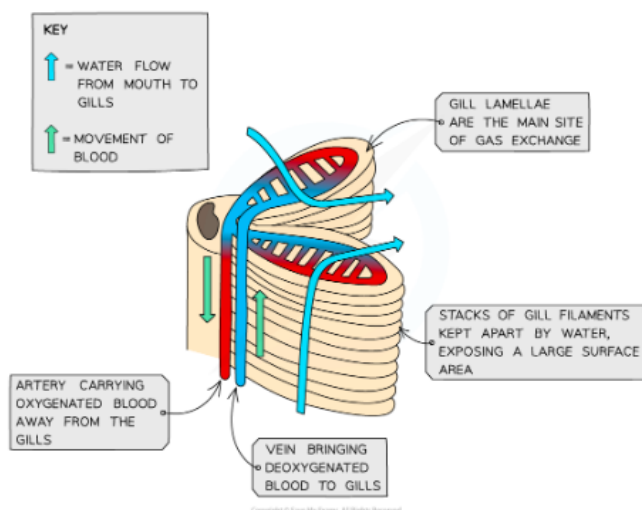
Different organisms have similar adaptations to maximise the exchange of substances.

The small intestine

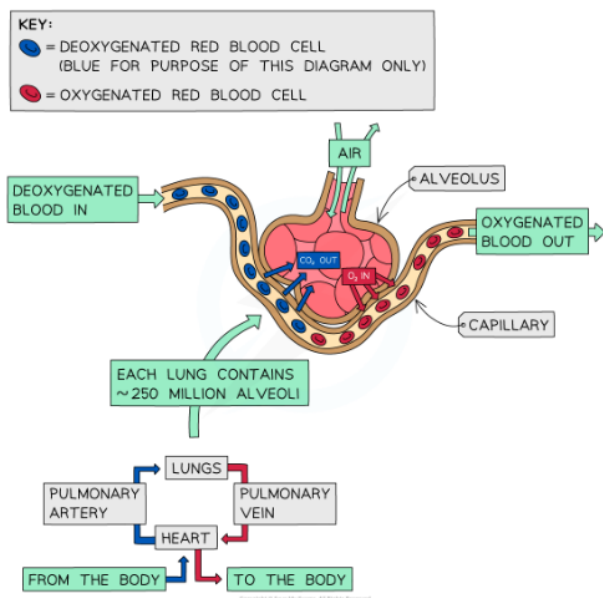


The highly folded surface of the small intestine increases its surface area

The gills (fish)

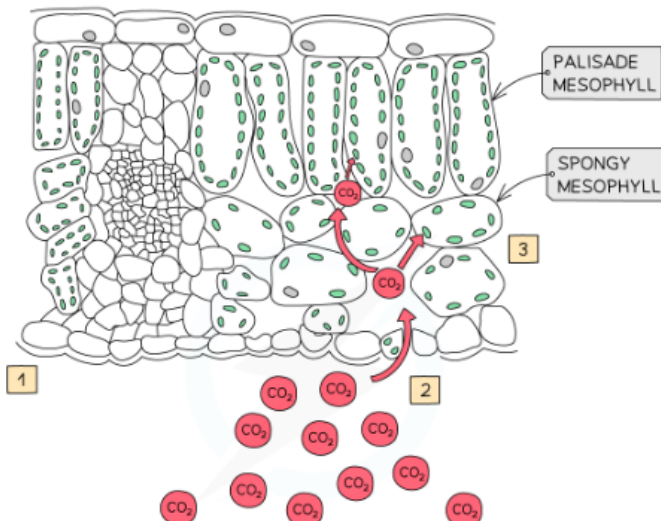


The lungs (mammals)



The alveolus is the gas exchange surface in humans

PATHWAY OF CO₂ MOLECULE WHEN LEAF IS PHOTOSYNTHESIS



- 1 HIGHER CONCENTRATION OF CO₂ IN ATMOSPHERE COMPARED TO INSIDE OF LEAF
- 2 CO₂ DIFFUSES INTO LEAF THROUGH OPEN STOMA INTO AIR SPACE IN SPONGY MESOPHYLL
- 3 CO₂ DIFFUSES THROUGH CELL WALL + CELL MEMBRANE OF MESOPHYLL CELL, DISSOLVES IN CYTOPLASM + DIFFUSES INTO CHLOROPLAST

In summary, multicellular organisms have surfaces and organ systems that **maximise the exchange of materials** by increasing the efficiency of exchange in a number of ways:

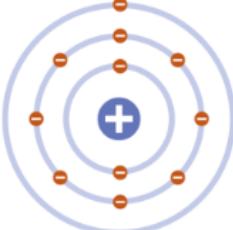
- Having a **large surface area** to increase the rate of transport
- A barrier that is as thin as possible to separate two regions, to provide as **short** a diffusion path as possible for substances to move across

In addition, animals have:

- A large network of blood vessels throughout the body:
 - To reduce distance of exchange of materials between cells and the bloodstream
 - To move substances towards or away from exchange surfaces to maintain concentration gradients
- Gas exchange surfaces that are well ventilated to maintain concentration gradients

Chemistry

Structure of the atom

Solid sphere model	Plum pudding model	Nuclear model	Planetary model
			
John Dalton	J.J. Thomson	Ernest Rutherford	Niels Bohr
 1803	 1904	 1911	 1913
Dalton drew upon the Ancient Greek idea of atoms (the word 'atom' comes from the Greek 'atomos' meaning indivisible). His theory stated that atoms are indivisible, those of a given element are identical, and compounds are combinations of different types of atoms.	Thomson discovered electrons (which he called 'corpuscles') in atoms in 1897, for which he won a Nobel Prize. He subsequently produced the 'plum pudding' model of the atom. It shows the atom as composed of electrons scattered throughout a spherical cloud of positive charge.	Rutherford fired positively charged alpha particles at a thin sheet of gold foil. Most passed through with little deflection, but some deflected at large angles. This was only possible if the atom was mostly empty space, with the positive charge concentrated in the centre: the nucleus.	Bohr modified Rutherford's model of the atom by stating that electrons moved around the nucleus in orbits of fixed sizes and energies. Electron energy in this model was quantised; electrons could not occupy values of energy between the fixed energy levels.
+ Recognised that atoms of a particular element differ from other elements.	+ Recognised electrons as components of atoms.	+ Realised that positive charge was localised in the nucleus of an atom.	+ Proposed stable electron orbits; explained the emission spectra of some elements.
- Atoms aren't indivisible – they're composed from subatomic particles.	- No nucleus, and didn't explain later experimental observations.	- Did not explain why electrons remain in orbit around the nucleus.	- Moving electrons should emit energy and collapse into the nucleus; model did not work well for heavier atoms.

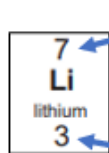
Protons, Neutrons and Electrons

To work out what is inside an atom, we use the periodic table!

Number of protons

This is the same as the **PROTON (atomic)** number.

Lithium has **3** protons

	Mass number
	Proton (atomic) number

Number of neutrons

This is the **MASS** number – the **PROTON** number.

Lithium has $7 - 3 = 4$ neutrons

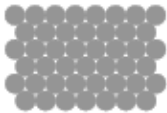
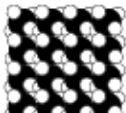
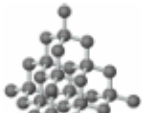
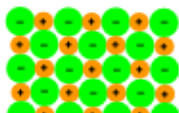
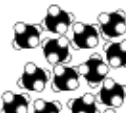
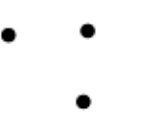
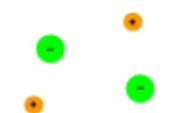
Number of electrons

This is the same as the **PROTON (atomic)** number in a **neutral** atom.

Lithium has **3** electrons

Bonding and Structure

Use 'look, cover, write, check' to learn each section.

	Monatomic	Simple molecular	Giant covalent	Ionic	Metallic
Substances	Group 0 elements	Elements: H ₂ O ₂ N ₂ F ₂ Cl ₂ Br ₂ I ₂ S ₈ P ₄ Compounds: non-metal with non-metal	Elements: Si, diamond, graphite Compounds: SiO ₂	Compounds: metal with non-metal	Elements: metals
What the structure is	Individual atoms with very weak forces between them	Individual molecules with weak forces between them (atoms within molecules are joined by covalent bonds)	Lattice structure in which all atoms are joined to others by covalent bonds	Lattice structure of positive and negatively charged ions (ions are held together by attraction between the + and - ions (this +/- attraction is known as an ionic bond, though it is just an electrostatic attractive force))	Lattice structure of metal ions with outer shell electrons free to move through the structure
The formula	Just the symbol e.g. Ar	e.g. H ₂ O each molecule contains 1 O and 2H atoms	e.g. SiO ₂ ratio of Si:O atoms is 1:2 through the structure	e.g. MgCl ₂ ratio of Mg ²⁺ :Cl ⁻ ions is 1:2 through the structure	Just the symbol e.g. Fe
Melting and boiling points	VERY LOW Very weak forces between atoms	LOW Weak forces between the molecules (Note – the atoms within the molecules are held together by strong covalent bonds, but these DO NOT break when molecules melt/boil)	VERY HIGH Need to break many strong covalent bonds	HIGH Strong electrostatic attraction between positive and negative ions	HIGH Strong electrostatic attraction between positive metal ions and delocalised negative electrons
Conductivity	DO NOT CONDUCT No charged particles that can move – atoms are neutral	DO NOT CONDUCT No charged particles that can move – molecules are neutral	DO NOT CONDUCT No charged particles that can move – electrons are NOT delocalised EXCEPT GRAPHITE Delocalised electrons move between layers	CONDUCT (molten / dissolved) Ions can move DO NOT CONDUCT (as solids) Ions cannot move	CONDUCT Outer shell electrons are delocalised
Solubility in water	INSOLUBLE	INSOLUBLE (usually)	INSOLUBLE	SOLUBLE (usually)	INSOLUBLE (but some react with water)
Solid					
Liquid					
Gas					

Computer Science

Computer Systems		
1	hardware	The physical parts of a computer that you can touch, such as the keyboard, monitor, and internal components.
2	software	The programs and instructions that tell the computer what to do, such as apps, games, or the operating system.
3	peripherals	External devices connected to a computer that add extra functions, such as printers, mice, webcams or speakers.
4	CPU	The main processor of the computer that carries out instructions and performs calculations. Central Processing Unit
5	RAM / memory	Stores data and programs while the computer is running so they can be accessed quickly. The data is lost when the computer is turned off.
Networking		
1	network	A group of computers and devices connected together so they can share data, resources and internet access.
2	LAN	A network that connects computers in a small area, such as a school, home or office building.
3	WAN	A network that connects computers over a very large area, such as across countries or the world. The internet is the biggest WAN.
4	Ethernet / wired	Network connection that uses cables to connect devices to a network. Large bandwidth (compared to WiFi), allowing for faster data transmission.
5	wireless	Connecting devices to a network usually using Wi-Fi, meaning now cables. Allows portable devices to connect but can suffer from interference and limited range.
E-Safety: Cybercrime		
1	fraud	A crime where someone tricks people in order to steal money or personal information. Can also result in identity theft.
2	malware	Malicious software designed to harm a computer, steal data, or disrupt how a system works. Examples include viruses, ransomware and keyloggers
3	brute force attack	A hacking method where a computer repeatedly tries many different passwords until it finds the correct one.
4	phishing	A scam where criminals send fake emails, messages, or websites to trick people into giving away personal details such as passwords or bank information.
5	ransomware	A type of malware that locks or encrypts a computer's files and demands payment to unlock them.



Sharp minds in Computer Science: where to look

- All lessons can be accessed from Google Classroom - even if you miss a lesson!
- Remember that homework in year 9 will always be on Genie:
<https://genie.hartismere.com>
- If you have any problems seeing the screen, with the brightness, with the colours, finding homework, with the equipment, or anything else, talk to your teacher - they can probably help!

Drama

Devising Drama from a Stimulus		
	Key term or word	Definition
1	devising	Creating a piece of drama collaboratively, often from an idea, stimulus, or theme, rather than a pre-written script.
2	stimulus	The starting point for a devised performance, such as an image, story, music, or current event.
3	improvisation	Making up dialogue, movement, or action spontaneously to explore ideas and develop scenes.
4	characterisation	The process of creating and portraying a believable character through voice, movement, and expression.
5	role on the wall	A visual technique to explore a character's personality, thoughts, feelings, and relationships.
6	thought tracking	When a character speaks their inner thoughts aloud to the audience to reveal emotions or intentions.
7	hot seating	One actor sits in a "hot seat" and answers questions in character to develop understanding of their role.
8	status	The social or power position of a character in a scene, which can influence their behaviour and relationships.
9	tension	The sense of excitement, suspense, or conflict in a scene that keeps the audience engaged.
10	Mood or atmosphere	The feeling or tone created in a scene through lighting, sound, movement, and performance choices.
11	narrative structure	How the story is organised and unfolds, including exposition, climax, and resolution.
12	ensemble	A group of performers working together collaboratively, sharing focus and responsibility in a performance.

Performance from a text		
	Key term or word	Definition
13	script or play text	The written text of a play, including dialogue, stage directions, and character instructions.
14	blocking	Planning and rehearsing the precise movements and positioning of actors on stage.
15	cue	A signal (line, action, or sound) that prompts an actor or stage crew to perform an action.
16	rehearsal	Practice sessions where actors and directors work on performing the play accurately and expressively.
17	dress rehearsal	A full run-through of the play in costume, with props, lighting, and sound, just like a real performance.
18	run-through	Performing the play from start to finish without stopping, usually as practice before final performance.
19	character motivation	Understanding what a character wants and why they act in a certain way in the play.
20	timing or pacing	The speed and rhythm of dialogue and action to make scenes effective and believable.
21	projection	Speaking loudly and clearly so the audience can hear every word.
22	expression	Using facial expressions, gestures, and tone of voice to show emotion and meaning.
23	stage directions	Instructions in the script about movement, position, or delivery of lines.
24	audience awareness	Performing with attention to the audience, including maintaining engagement and responding to their reactions.

Practical Exploration of a play text: <i>An Inspector Calls</i>		
	Key term	Definition
25	social responsibility	The idea that characters are accountable for their actions and the impact they have on others.
26	dramatic irony	When the audience knows information that the characters do not, creating tension or anticipation.
27	foreshadowing	Hints or clues about events that will happen later in the play.
28	monologue	A long speech by one character expressing their thoughts, feelings, or intentions.
29	dialogue	Conversation between two or more characters, revealing relationships and advancing the plot.
30	perspective	The viewpoint or attitude of a character, which influences how they see events and interact with others
31	juxtaposition	Placing contrasting characters, ideas, or events side by side to highlight differences.
32	symbolism	Objects, characters, or events that represent larger ideas, e.g., the Inspector as a symbol of morality.
33	conflict	The struggle or tension between characters, ideas, or social classes in the play.
34	prop-use	Using objects on stage to support storytelling, characterisation, and mood.
35	spatial relationships	How characters are positioned relative to each other on stage, showing power, closeness, or distance.
36	tempo-rhythm	The speed and flow of speech, movement, or scene transitions, which affect dramatic impact.



Sharp minds in drama: where to look

- Participate in the school production. Acting, singing, or working backstage in a full school play helps develop stagecraft, teamwork, and confidence in front of a live audience.
- Take LAMDA exams. Preparing for a London Academy of Music & Dramatic Art (LAMDA) graded exam improves performance technique, vocal skills, and characterisation, with professional feedback from examiners.
- Join a drama club or theatre workshop. Regular sessions allow students to experiment with improvisation, devising, and different performance styles, which builds versatility and creativity.
- Enter performance competitions or festivals. Participating in monologue competitions, ensemble challenges, or youth theatre festivals pushes students to perform under pressure, develop stage presence, and receive constructive feedback.

Combining activities—like preparing a LAMDA monologue while helping with a school production—can dramatically accelerate skill development because it mixes performance, rehearsal discipline, and feedback practice.

English

Grammar

	Term or word	Definition
1	noun	Nouns are typically words for people, places, animals and objects (e.g. doctor, Peter, Paris, dinosaur) and also many words for abstract things such as feelings, emotions and qualities (e.g love, hope, mystery).
2	noun phrase	This is a group of words in a sentence that together behave like a noun. For example, in the sentence 'We took the night bus, 'the night bus' is a noun phrase.
3	verb	A word that usually conveys an action (read, walk, run), an occurrence (happen, become) or a state of being (be, exist).
4	adjective	A word that modifies (changes) a noun, e.g. the <u>blue</u> car; your cake is <u>bigger</u> than mine.
5	adverb	Adverbs typically modify (change) a verb, an adjective, another adverb or entire clause or sentence, e.g 'He wrote it down <u>quickly</u> '; 'The film ended <u>too</u> soon'.
6	pronoun	Pronouns replace nouns or noun phrases, for example, 'We like Tom' → 'We like him.' 'I like my new bike.' → 'I like it.' Personal pronouns usually refer to people or other living things.
7	preposition	A word that is used before a noun, a noun phrase, or pronoun. For example, in the sentence, 'The dog jumped over the wall', the word 'over' is a preposition.
8	prepositional phrase	A group of words made up of a preposition and a noun or pronoun. For example, in the sentence, 'The book is on the desk', 'on the desk' is a prepositional phrase.
9	subordinate clause	A clause that cannot form a sentence on its own, but can be joined to a main clause to form a sentence.

Writers' methods

1	consonance	The repetition of similar-sounding consonants in close proximity.
2	alliteration	The occurrence of the same sound at the beginning of adjacent or closely connected words.
3	assonance	A similarity of sound between syllables of nearby words, arising particularly from the rhyming of vowels.
4	sibilance	A type of alliteration that relies on the repetition of soft consonant sounds.
5	onomatopoeia	The formation of a word from a sound associated with what it describes.
6	enjambment (or run-on line)	In a poem, the continuing of a sentence from one line of a poem into the start of the next line.
7	simile	The comparison of one thing with another thing using 'like' or 'as'.
8	metaphor	A figure of speech in which a word or phrase is applied to an object or action to which it is not literally applicable.
9	extended metaphor	A comparison between two unlike things that continues throughout a series of sentences in a paragraph or lines in a poem.

10	personification	Giving a personal nature or human characteristics to something that is not human.
11	symbolism	The use of symbols to represent ideas or qualities.
12	tone	In writing, the general mood or main qualities of something.
13	characterisation	The way that people are represented in a film, play, or book so that they seem real and natural.
14	motif	A pattern or design. In literature, this might be a repeated idea or image.
15	structure	The way in which the parts of something are arranged or organised. In writing, it is the order of your ideas or points.
16	pace	The speed at which a story unfolds and how quickly events are revealed to the reader
17	tension	A build up of, or feeling, of nervousness, fear or anger.
18	climax	The most important or exciting point in a story or situation, especially when this happens near the end.
19	resolution	The end or solution to a story.
20	setting	The time and place in which the action or a book, film or play happens.
21	allegory	A story, play, poem, picture or other work in which the characters and events represent particular qualities or ideas that relate to morals, religion or politics.
22	bias	The action of supporting or opposing a particular person or thing in an unfair way and allowing personal opinions to influence your judgement.
23	dialogue	A conversation between two or more characters, revealing relationships and advancing the plot.
24	show not tell	Using what a character in a novel, play or film observes to give insight into their character.
25	sensory language	Words and phrases which use any of the five senses to appeal to the reader.
26	hyperbole	Exaggerated statements or claims not meant to be taken literally.
27	irony	A form of deliberate mockery in which someone says the opposite of what is obviously true.
28	bathos	A sudden change from a beautiful or important subject to a silly or very ordinary one.
29	juxtaposition	When a writer places contrasting characters, ideas or events side by side to highlight differences.
30	direct address	Talking directly to the reader.
31	auxesis	A figure of speech in which things are arranged in order of increasing importance, intensity or magnitude.

32	semantic field	A group of words or phrases that share a common theme, subject or area of meaning.
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Relationships (short stories and narrative)

1	ostracise	To avoid someone intentionally, or to prevent someone from taking part in the activities of a group.
2	claustrophobia	A fear of being in enclosed spaces.
3	isolated	Not near to other places or people or a feeling of unhappiness because of not seeing or talking to other people.
4	critique	The action of supporting or opposing a particular person or thing in an unfair way and allowing personal opinions to influence your judgement.
5	satire	A way of criticising people or ideas in a humorous way, especially in order to make a political point, or to change something.
6	ominous	Suggesting that something unpleasant is going to happen.

An Inspector Calls: quotations

Act	Quotation
Act 1	Arthur Birling: "I'm speaking as a hard-headed, practical man of business"
Act 1	Sheila Birling: "But these girls aren't cheap labour - they're <i>people</i> ."
Act 2	Mrs Birling: "girls of that class -"
Act 3	Eric: "my child - your own grandchild - you killed them both - damn you, damn you-"
Act 3	Inspector Goole: "We don't live alone. We are members of one body. We are responsible for each other."
Act 3	Inspector Goole: "if men will not learn that lesson, then they will be taught it in fire and blood and anguish"



Sharp minds in English: where to look

- In English, there is a sure-fire way to improve, and that's to read as much as you can. We know it's hard, with so many other things to distract you, but reading is fun and improves your work in all subjects, not just English.
- You could visit the library and speak to the librarian about the kind of books you enjoy. Try some new writers. If you don't like reading so much, tell her - we have books specifically for you!
- You could use the 'Good Reads' website to search for new ideas and recommendations
- You could join the HARRT (Hartismere Avid Readers Recommendations Team!) if you really enjoy reading - get together with other people and talk about all things books!
- You could watch a film of a favourite book
- Visit the theatre and cinema
- Explore poetry online using poets.org
- You could use your Lexia login (if you have one) to complete another 20 minutes or your Wordshark login (if you have one) to complete another 20 minutes.

French

Key verbs in three tenses

<u>Past tense</u> (what I did)	<u>Present tense</u> (my routine)	<u>Future tense</u> (what I'm going to do)
J'ai joué = I played	Je joue = I play	Je vais jouer = I am going to play
J'ai joué = I ate	Je mange = I eat	Je vais manger = I am going to eat
J'ai regardé = I watched	Je regarde = I watch	Je vais regarder = I am going to watch
J'ai bu = I drank	je bois = I drink	Je vais boire = I am going to drink
J'ai fait = I did	Je fais = I do	Je vais faire = I am going to do
Je suis allé(e) = I went	Je vais = I go	Je vais aller = I am going to go
C'était = it was	C'est = it is	Ca sera = it will be
		Je voudrais = I would like

Relationships

Je m'entends bien avec	I get on well with
Je m'entends mal avec	I get on badly with
Je me dispute avec	I argue with
Je m'amuse avec	I have fun with

My role model

Mon modèle est...	My role model is...
Chanteur/euse, acteur/trice écrivain(e), sportif/ive.	A singer, actor, sportsperson, writer
Il/Elle m'inspire car il/elle est...	He / she inspires me because he/she is...
Motivé(e), travailleur/euse, célèbre	Motivated, hardworking, famous

Injuries and illnesses

J'ai mal à la tête, au ventre, aux dents	I've hurt my head / stomach / teeth
Je suis malade / fatigué(e) / enrhumé(e)	I am ill / tired / full of a cold
J'ai faim / soif / chaud / froid	I am hungry / thirsty / hot / cold
Il faut rester au lit / voir le médecin	You have to stay in bed / see the doctor

Healthy living

Je suis sain(e) / malsain(e)	I am healthy / unhealthy
Je mange équilibré / beaucoup de fruits et légumes	I eat a healthily / lots of fruit and vegetables
Je ne fume /bois jamais d'alcool	I never smoke / drink alcohol
Je ne mange plus de chocolat / bonbons	I no longer eat chocolate / sweets

Life at school

Au collège on doit/ on ne doit pas	At school one must / must not
Porter un uniforme / utiliser un portable / respecter les profs	Wear a uniform / use a phone / respect the teachers
Ma matière préférée est...	My favourite subject is...
Je vais continuer avec le français / l'histoire / la musique	I am going to continue with French / History / Music

Future jobs

Je voudrais / veux être	I would like / want to be
Avocat(e), serveur/euse, coiffeur/euse	Lawyer, waiter/tress, hairdresser
A l'avenir je vais aller au lycée /à l'université	In the future I am going to go to college / university
Plus tard je vais habiter à l'étranger	Later I am going to live abroad

Holidays - transport and accommodation

Je voyage en avion / bateau / voiture / train	I travel by plane / by boat / by car / by train
C'est rapide / lent / confortable / cher / pratique	It is fast / slow / comfortable / expensive / practical
Je reste dans un hôtel / un camping / un auberge de jeunesse	I stay in a hotel / on a campsite / in a youth hostel
Il y a une piscine / un magasin / une salle de jeux	There is a swimming pool / a shop / a games room

Holidays - weather and activities

Quand il fait chaud / froid /beau /mauvais	When the weather is hot / cold / good / bad
Je fais de la natation / du vélo / du tourisme	I go swimming / bike-riding / sightseeing
Je joue au foot / au volley / au tennis	I play football / volleyball / tennis
Je visite le musée / les monuments historiques	I visit the museum / historical monuments

Past holidays

L'année dernière / l'été dernier	Last year / last summer
Je suis allé(e) en France/Italie /Espagne	I went to France / Italy / Spain
Je suis resté dans un hôtel /un camping	I stayed in a hotel / campsite
J'ai voyagé en avion / en voiture	I travelled by plane / car



Sharp minds in French: where to look

- BBC Bitesize : <https://www.bbc.co.uk/bitesize/subjects/zgdqxn>
- Quizlet – make revision cards and learn vocabulary
- Lingo Clip – listen to music and improve your French <https://lingoclip.com>
- Watch French films and television programmes on Netflix, having subtitles in English is absolutely fine.
- Conjuguemos - practise verb conjugations and grammar points
<https://conjuguemos.com/activities/french/grammar/1>

Geography

	Word or term	Definition
1	stack	An erosional landform created when an arch collapses
2	stump	An erosional landform created when a stack collapses
3	cave	A natural underground chamber in a hillside or cliff; an erosional landform
4	wave-cut platform	The flat area left behind when waves erode a cliff away
5	spit	A depositional landform created by longshore drift often forming where there is a river mouth
6	bar	A depositional landform created by longshore drift forming to connect the mainland at two points
7	tombolo	A depositional landform created by longshore drift forming to connect the mainland to an island
8	hydraulic action	Waves trap air in the cracks in the rock making the cracks get bigger over time
9	abrasion	Waves fling pebbles and the cliff, scraping away rock or the river flow causes rocks to scrape the bed or banks of a river
10	attrition	Waves knock chunks of rock together to break them down into smaller, rounder pebbles which are deposited on the beach/river bank
11	solution/corrosion	The water dissolves soluble material from the rocks
12	longshore drift	The transportation of sediment parallel to the coast
13	deposition	Waves or a river don't have enough energy to carry the sand or pebbles and drop them
14	rip rap	A coastal defence: loose rocks placed by man to armour shorelines against erosion
15	revetments	A coastal defence: sloping structures placed on banks or cliffs to absorb wave energy
16	gabions	A coastal defence: a basket or container filled with stones, placed along the shoreline to protect against erosion
17	sea wall	A coastal defence: a wall or embankment (usually concrete) erected to prevent the sea eroding an area of land
18	groyne	A coastal defence: a low wall or sturdy barrier built out into the sea from a beach to prevent longshore drift
19	beach nourishment	A coastal defence: a process by which sediment, usually sand, lost through longshore drift or erosion is replaced from other sources
20	hard engineering	Coastal management used to protect coasts by absorbing the energy of waves using highly visible man-made structures. Expensive, short-term solutions that can have a negative impact on the environment
21	soft engineering	Coastal management that works with nature to protect the coast, using ecological practises to have less of a negative impact on the environment. Less expensive to implement and maintain, creating more long-term, sustainable solutions
22	source	The point at which a river starts to flow
23	mouth	The end of a river, where it flows into a lake or the sea
24	tributary	A smaller river that flows into a larger one
25	waterfall	River flows over a step in the rock
26	meander	A bend in a river
27	saltation	The picking up and dropping of pebbles (in a bouncing or hopping motion)
28	suspension	Sand carried by the river or sea – makes it look dirty...
29	bedload	The sand, gravel, boulders or other debris transported along the bottom of a river (not the particles in suspension)

30	delta	Flat area of deposited material at the mouth of a river, where it enters the sea
31	estuary	The mouth of a large river
32	v-shaped valley	A valley created by vertical erosion (where the river cuts down) near the source of the river
33	geomorphic processes	Natural processes that shape the earth such as weathering and erosion
34	long profile	A slice taken along a river from source to mouth
35	embankments	Raising the banks of a river so that it can hold more water



Sharp minds in Geography: where to look

- Horrible Geographies - Earth shattering Earthquakes
- Raging Rivers, Anita Ganeri
- Rocks and Fossils Struan Reid
- The Carbon Diaries, Saci Lloyd
- Watching Documentaries: David Attenborough and Simon Reeve both have presented a wide range of documentaries on different topics and places

History

Rome and Egypt

	Term or word	Definition
1	Cleopatra	The last ever Pharaoh of Egypt
2	Julius Caesar	The first Roman Emperor who was killed in the Senate by a number of his allies. He had a son with Cleopatra.
3	Marc Anthony	A general in the Roman army. He had three sons with Cleopatra after Julius Caesar's death.
4	Octavian (Augustus)	The first Roman Emperor. He became leader after Julius Caesar's death.
5	509 BC	Rome becomes a republic.
6	69 BC	Cleopatra is born.
7	46 BC	Cleopatra is in Rome for the first time.
8	44 BC	Julius Caesar is assassinated.
9	33 BC	Rome becomes an empire.
10	31 BC	The battle of Actium.
11	30 BC	Egypt is officially occupied by the Roman Empire.
12	alliance	A formal agreement to be friendly. Can be people or countries.
13	assassination	The murder of someone for political or religious reasons.
14	civil war	A war within a country. I.e. two different parts of the Roman Empire at war with each other.
15	consul	They controlled the army. There were elections every year and they could not be elected for two consecutive terms.
16	empire	A place led by an emperor or monarch who has total control.
17	inference	A suggestion based on information you can see.
18	interpretation	How someone sees and thinks about a certain event. Two historians might have a different interpretation of the same thing.
19	Pharaoh	The leader of Egypt.
20	Republic	A country without a monarch or emperor. In theory it is a democracy.
21	Senate	The group of advisors to consuls and emperors. They held the position for life.
22	triumvirate	The triangle of power between Mark Antony, Octavian and Lepidus. All wanted more power so the triumvirate wouldn't last.

Russia

	Term or word	Definition
1	Bolsheviks	A political group that wanted a Marxist revolution in Russia.
2	Nicholas II	The Tsar of Russia at the time of the revolution.
3	Romanov	The surname (family name) of the family that ruled Russia for over 300 years. They were the Tsars.
4	Vladimir Lenin	The leader of the Bolsheviks and later the leader of Russia.
5	1891-1892	Famine in Russia.
6	1905	Bloody Sunday.
7	1905	Revolution in Russia.
8	1914	The start of World War I.
9	1917	Revolution in Russia.
10	autocracy	A system of government where one person has total power.
11	bourgeoisie	The middle classes, associated with wealth and ownership of businesses
12	constitution	A set of rules that outline how a country is governed.
13	Duma	A national parliament in Russia. Like the one we have in the UK.
14	empire	A collection of land or countries that all fall under the control of one group.
15	famine	When there is widespread death and disease related to hunger.
16	intelligentsia	A group within Russia that were educated, middle-class and wanted changes.
17	manifesto	A set of political beliefs and ideas that you write down and say you will do.
18	Marxist	A political belief that involves total equality and the government owning everything.
19	Okhrana	The secret police of Russia, they were there to suppress political opposition.
20	peasant	Someone who was poor and typically worked as a farmer.
21	proletariat	The working class, especially in industrial societies.
22	revolution	A sudden and significant change in society.
23	rural	In the countryside.
24	tsar	The Emperor of Russia.
25	urban	In towns or cities.

The Holocaust

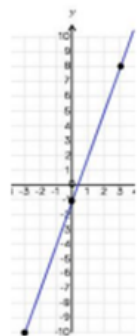
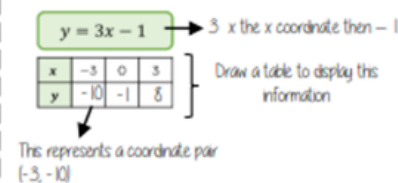
	Term or word	Definition
1	Adolf Hitler	The leader of Nazi Germany and the person behind the Holocaust.
2	Heinrich Himmler	He was in charge of the police state in Nazi Germany.
3	Josef Goebbels	He was the head of propaganda in Nazi Germany.
4	Reinhard Heydrich	The man who implemented the 'final solution'.
4	1919	The start of the 'stab-in-the-back' idea that German Jews betrayed Germany during World War I.
5	1933	Hitler comes to power in Germany.
6	1933	The burning of Jewish books.
7	1935	Nuremberg laws remove most of the rights of German Jews.
8	antisemitism	Hostility or prejudice towards Jews.
9	Aryan	A Nazi idea about the perfect human. They would be German, blonde haired and blue eyed.
10	discrimination	To treat differently and act on your prejudices.
11	Gestapo	A secret, undercover police in Nazi Germany.
12	Holocaust	The mass-murder and attempted extinction of Jewish people in Europe.
13	Jewish	Someone that follows the religion of Judaism.
14	Kristallnacht	Literally 'The night of broken glass'. A night of persecution, violence and arson attacks on Jewish people.
15	Nazi	A member of the Nazi Party. Responsible for the Holocaust.
16	persecution	Relentless unfair treatment of a person or group.
17	prejudice	An unfair opinion, judgement or feeling towards someone.
18	propaganda	When you try to convince someone of something using posters/films/speeches/radio.
19	racism	The belief that a person's skin colour, or race, determines their ability.
20	scapegoat	Someone who is blamed for the wrongdoings, mistakes or faults of others.
21	Blitzkrieg	A 'lightning war' - the name given to the tactics used by Nazis using tanks.
22	Concentration camp	A place where people were kept as prisoners or to do hard labour.
23	Operation Barbarossa	The invasion of the Soviet Union by the Nazis.
24	Einsatzgruppen	A name for groups of SS soldiers who followed behind the army in Operation Barbarossa. They would shoot anyone suspected of being Jewish (2.2 million people in total).
25	Extermination camp	A place where people were taken specifically to be murdered.
26	Jewish question	The way the Nazis referred to their question of what they wanted to do to all of Europe's Jewish population.
27	final solution	The Nazis' answer to the Jewish question which meant the mass murder of Europe's Jewish population.
28	ghetto	A segregated part of a town or city in which Jewish people were forced to live. It was very strictly controlled and guarded.

29	liberation	When the allied forces pushed the Nazis back and freed the camps.
30	persecution	The relentless unfair treatment of a person or group.
31	Wannsee Conference	The meeting where the Nazis agreed to implement the Final Solution.

Civil rights

	Term or word	Definition
1	A Phillip Randolph	A leader of the NAACP who worked to desegregate the army.
2	Emmett Till	A Black 14 year old boy murdered for whistling at a woman.
3	Martin Luther King	He organised lots of protests and marches to support civil rights. He was leader of the SCLC Movement and led the March on Washington in 1963 where he gave the 'I have a dream speech'
4	Rosa Parks	She refused to give up her seat on a bus in 1955 which led to the Montgomery Bus Boycott and the ending of segregation on buses. Many people consider this the start of the Civil Rights Movement.
4	Scottsboro Boys	A group of boys who were accused of sexually assaulting two young women, despite it being clearly untrue.
5	Walter Francis White	A leader of the NAACP. He wanted national desegregation.
6	1929	The Wall Street Crash.
7	1930	The Great Depression starts and lasts for many years.
8	1933	The New Deal was launched.
9	1955	Emmett Till is murdered.
10	1963	The march on Washington DC.
11	1964	The Civil Rights Act is passed.
12	Brown vs Board of Education	A trial that ended segregation in schools.
13	Civil Rights	The fight for equal rights for black people and other minority groups in society.
14	The Great Depression	When the economy gets much smaller very quickly. Leads to lots of people losing their jobs and any savings they might have.
15	integrate	To mix white and black people together.
16	'Jim Crow' laws	Laws in the southern states that limited black people's rights.
17	Ku Klux Klan	An extremist Christian organisation that persecuted black people.
18	Little Rock Nine	School students who tried to go to a previously white-only school after Brown vs Board of Education was passed.
19	lynching	The public killing of someone without a fair trial. Occasionally happened to black people at this time.
20	NAACP	National Association for the Advancement of Coloured People.
21	New Deal	A large piece of legislation that included huge amounts of government spending to try to aid people out of the Depression .
22	segregate	Separating someone or something.
23	sit-in	Sitting in a restaurant or cafe for days at a time without ordering anything. The authorities didn't know what to do because there were no rules against sitting there.

Plotting $y = mx + c$ graphs



You only need two points to form a straight line

Plotting more points helps you decide if your calculations are correct (if they do make a straight line)

Remember to join the points to make a line

Solve equations with brackets

$$3(2x + 4) = 30$$

Expand the brackets

$$6x + 12 = 30$$

$$-12 \quad -12$$

$$6x = 18$$

$$-6 \quad -6$$

$$x = 3$$

Equations with unknown on both sides

$$4x + 5 = 3x + 24$$

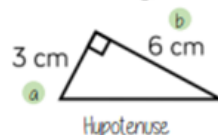
$$-3x \quad -3x$$

$$x + 5 = 24$$

$$-5 \quad -5$$

$$x = 19$$

Calculate the hypotenuse



Either of the short sides can be labeled a or b

$$a^2 + b^2 = \text{hypotenuse}^2$$

1 Substitute in the values for a and b

$$3^2 + 6^2 = \text{hypotenuse}^2$$

$$9 + 36 = \text{hypotenuse}^2$$

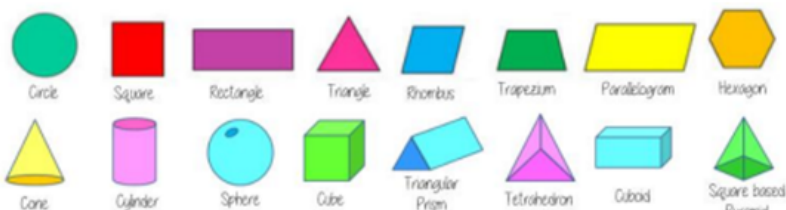
$$45 = \text{hypotenuse}^2$$

2 To find the hypotenuse square root the sum of the squares of the shorter sides

$$\sqrt{45} = \text{hypotenuse}$$

$$6.71\text{cm} = \text{hypotenuse}$$

Name 2D & 3D shapes



Area of 2D shapes

Rectangle
Base x Height



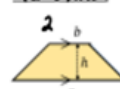
Triangle
 $\frac{1}{2} \times \text{Base} \times \text{Perpendicular height}$



Parallelogram/ Rhombus
Base x Perpendicular height



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

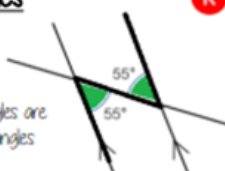


Area of a circle
 $\pi \times \text{radius}^2$



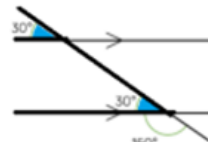
Alternate angles

Because alternate angles are equal the highlighted angles are the same size



Corresponding angles

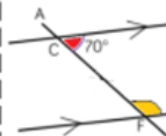
Because corresponding angles are equal the highlighted angles are the same size



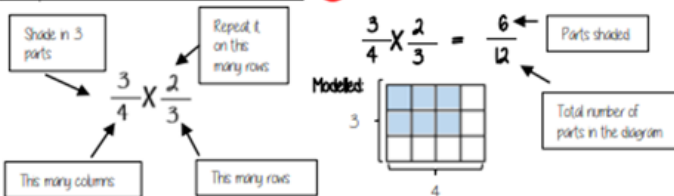
Co-interior angles

Because co-interior angles have a sum of 180° the highlighted angle is 110°

As angles on a line add up to 180° co-interior angles can also be calculated from applying alternate/ corresponding rules first



Multiplication/ Division of fractions



Remember to use reciprocals

$$2 \div \frac{3}{4} = \frac{2}{1} \times \frac{4}{3} = \frac{8}{3}$$

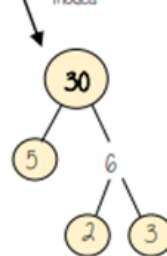
Multiplying by a reciprocal gives the same outcome

Represented



Factors, Multiples and Primes

Multiplication part-whole models



All three prime factor trees represent the same decomposition

HCF - Highest common factor

HCF of 18 and 30

18 1, 2, 3, 6, 9, 18

30 1, 2, 3, 5, 6, 10, 15, 30

Common factors are factors two or more numbers share

LCM - Lowest common multiple

LCM of 9 and 12

9 9, 18, 27, 36, 45, 54

12 12, 24, 36, 48, 60

Common multiples are multiples two or more numbers share

Maths, continued.

	Term or word	Definition
1	bisector	A line that divides something into two equal parts
2	congruent	The same shape and size.
3	credit	In financial terms, money being placed into a bank account.
4	debit	In financial terms, money that leaves a bank account.
4	equation	A statement that says two things are equal.
5	equidistant	The same distance.
6	face	A flat surface on a solid object.
7	factor	Integers that multiply together to get another number.
8	gradient	The steepness of a line.
9	HCF	Highest common factor (biggest factor two or more numbers share)
10	hypotenuse	The largest side on a right angled triangle. It is always opposite the right angle.
11	inequality	An inequality compares two values showing if one is greater than, less than, or equal to another.
12	integer	A whole number, which can be positive, negative, or zero.
13	Inverse operation	The operation that reverses the action.
14	invest	In financial terms, to use money with the goal of it increasing in value over time (usually in a bank).
15	LCM	Lowest common multiple (the first time the times table of two or more numbers match).
16	locus	A set of points with a common property.
17	multiples	These are found by multiplying any number with positive integers.
18	multiplier	A number you multiply by, (multiplier more than 1 = increasing; less than 1 = decreasing)
19	parallel	Two straight lines that never meet with the same gradient.
20	perpendicular	Two lines that meet at a right angle.
21	plan	A drawing of something when drawn from above (sometimes birds eye view).
22	polygon	A 2D shape made from straight edges.
23	prime	An integer with only 2 factors.
24	product	The result of a multiplication.
25	profit	In financial terms, the income less any expenses or costs.
26	ratio	A ratio shows the relative size of two variables.
27	reciprocal	A pair of numbers that multiply together to give 1.
28	relative frequency	How often something happens divided by the outcomes.
29	similar shapes	Shapes of different sizes that have corresponding sides in equal proportion and identical corresponding angles.
30	solve	To find a numerical value that satisfies an equation.
31	substitute	Putting numbers where letters are (replacing numbers into a formula)
32	sum	The result of adding two or more numbers.
33	variable	A quantity that may change within the context of the problem.
34	vertex	A point where two or more line segments meet.
35	volume	The amount of 3D space a shape takes up.



Sharp minds in maths: where to look

- Parallel Maths by Simon Singh <https://parallel.org.uk/>
This contains a selection of problem-solving and rich maths tasks.
- Corbett Maths <https://corbettmaths.com/>
This contains video clips and worksheets (with answers) for every module in maths.
- Sparx Maths
Try completing the Booster XP questions in your Sparx Maths
- Brilliant.org
A selection of problem-solving and rich maths tasks
- <https://nrich.maths.org/students/secondary>
Lots of challenging problem-solving activities designed by Cambridge University for secondary school students

Music

	Term or word	Definition			
1	genre	The style of a film / book / piece of music, eg. horror or romantic comedy			
2	Mickey Mousing	A technique where the music of a film is precisely synchronised with the action on screen			
3	orchestra	An ensemble containing string, woodwind, brass and percussion instruments			
4	staccato	A type of articulation where notes are short, spiky and detached			
5	legato	A type of articulation where notes are played smoothly			
6	tonality	Whether the music is in a major key or a minor key			
7	major key	When music uses notes from a major scale (will sound positive / happy)			
8	minor key	When music uses notes from a minor scale (will sound sinister / sad / mysterious)			
9	dynamics	How loud or quiet the music is			
10	dissonant	Harmony (chord) where the notes 'clash'			
11	consonant	Harmony (chord) where all the notes 'fit together'			
12	forte (f)	Loud	13	piano (p)	Quiet
14	fortissimo (ff)	Very loud	15	pianissimo (pp)	Very quiet
16	mezzo forte (mf)	Moderately loud	17	mezzo piano (mp)	Moderately quiet
18	crescendo (<)	Getting gradually louder			
19	diminuendo (>)	Getting gradually quieter			
20	semitone	The distance between a note and the next closest note, eg. C and C $\sharp$			
21	reggae	A musical style that developed in Jamaica in the late 1960s			
22	chord	3 notes played at the same time, constructed using the rule: <i>play a note – miss a note – play a note – miss a note – play a note</i> (eg. CEG)			
23	melody	The tune			
24	syncopation	Emphasis on the 'off-beats'			
25	tempo	How fast or slow the music is			
26	riff	A repeating musical idea			
27	back beat	Accents on beats 2 and 4			
28	interval	The distance between 2 notes			
29	folk music	Music associated with a particular area of the world, learnt by ear, and often used for dancing or storytelling			

30	phrase	A 'chunk' of melody (a little like a sentence)			
31	accompaniment	The 'backing' music which goes alongside the main melody (tune)			
32	pitch	How high or low the notes are			
33	tempo	How fast or slow the music is			
34	texture	The 'layers' in a piece of music (can be described as thick or thin)			
35	structure	The way a piece of music is made up of smaller sections, some of which may be repeated, eg. ABAB			
36	aural tradition	A means of learning music by ear / word of mouth (rather than it being written down as sheet music)			
37	unison	Where everyone plays exactly the same notes / rhythm at the same time			
38	call and response	Where one person or group sings or plays a line and is then answered by another person or group			
39	polyrhythm	2 or more contrasting rhythms heard at the same time			
40	improvisation	When a musician makes up the music on the spot			
41	notes in spaces in treble clef	Spell FACE: 			
42	notes on lines in treble clef	Stand for Every Green Bus Drives Fast: 			
43	crotchet 	A note held for 1 beat	44	minim 	A note held for 2 beats
45	dotted minim 	A note held for 3 beats	46	semibreve 	A note held for 4 beats
47	quaver 	A note held for ½ beat	48	semiquaver 	A note held for ¼ beat
49	crotchet rest 	A silence lasting 1 beat			



Sharp minds in music: where to look

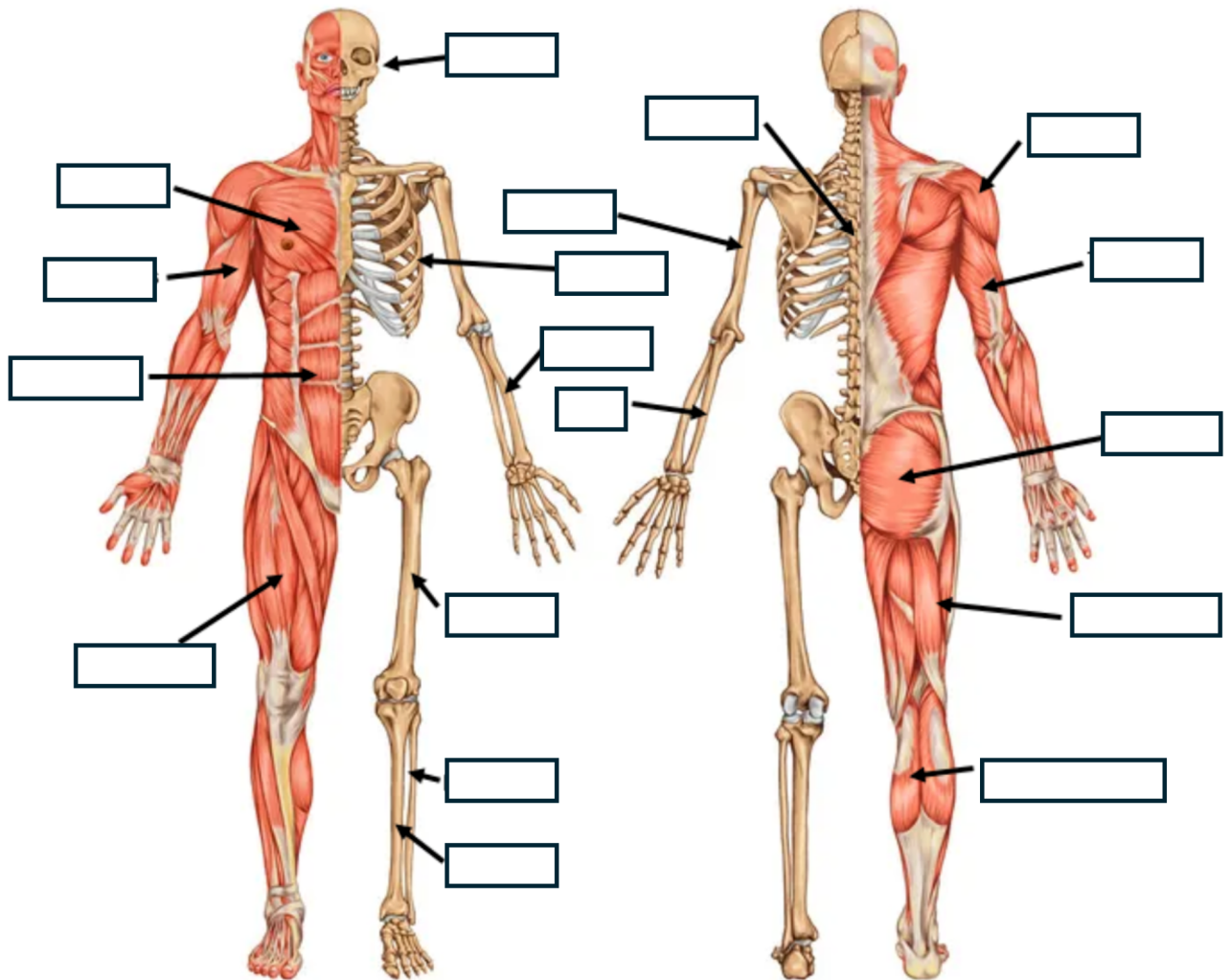
- Attend an extra-curricular music club for at least a term
- Take part in the school production
- Attend a concert or production, either within or outside school

Bone names & locations: • Scapula • Clavicle • Sternum • Pelvis	
Muscles names & locations: • Trapezius • Latissimus Dorsi • Tibialis anterior	
Term or word	Definition
tendons	Tendons are connective tissue that attaches muscle to bone. Its role is to transfer the effort created by a contracting muscle to the bone, resulting in the movement of that bone.
cartilage	Cartilage prevents friction and bones rubbing together
agonist	This is the muscle or group of muscles that contract to allow movement to take place. The agonist works in an antagonistic pair with the antagonist.
antagonist	This is the muscle or group of muscles that relax to allow movement to take place. The antagonist works in an antagonistic pair with the agonist.
gaseous exchange	The process where oxygen from the air in the alveoli moves into the blood in the capillaries, while carbon dioxide moves from the blood in the capillaries into the air in the alveoli
diastole	This is the phase of the heartbeat when the chambers of the heart relax and fill with blood.
systole	This is the phase of the heartbeat when the chambers of the heart contract and empty of blood; when blood is ejected from the heart.
vasoconstriction	This is the narrowing of the internal diameter of a blood vessel to decrease blood flow. The arteries dilate during exercise so that more blood is delivered to active areas, increasing their oxygen supply.

vasodilation	This is the widening of the internal diameter of a blood vessel to increase blood flow . The arteries dilate during exercise so that more blood is delivered to active areas, increasing their oxygen supply.
cardiac output	The amount of blood ejected from the heart in one minute or stroke volume x heart rate.
lactic acid	A mild poison and waste product of anaerobic respiration
Delayed onset muscle soreness (DOMS)	This is fatigue & muscle cramps - a short term effect of exercise (24-36 hours after you finish exercising).
abduction	The movement away from the midline of the body
adduction	The movement towards the midline of the body
planes	Imaginary lines depicting the direction of movement. Sagittal plane & transverse axis (flexion & extension) Frontal plane & sagittal axis (abduction & adduction) Transverse plane & longitudinal axis (rotation)
axis	An imaginary line through the body around which it rotates.
Methods of training: • weight • plyometric • HIIT	Weight training: the use of weights or resistance to cause adaptation of the muscles. Plyometric training: high impact exercises that teach the muscles to perform their maximum contractions faster; to be more powerful (an eccentric isotonic contraction is followed by a larger concentric isotonic contraction). HIIT: High Intensity Interval Training which involves alternating between short periods of intense work in the anaerobic training zone and periods of active recovery in the aerobic training zone.
classification of skills:	Categorisation of sporting skills in accordance with set continua. These include: • simple/complex • open/closed • self-paced/externally-paced • gross/fine
guidance: visual, verbal, manual, mechanical	A method to convey information to a performer. Guidance methods: • visual (seeing) • verbal (hearing) • manual (assist movement – physical) • mechanical (use of objects/aids).
Optimum levels of arousal for performance (inverted U)	Arousal is a physical and mental (physiological and psychological) state of alertness or readiness, varying from deep sleep to intense excitement or alertness. Being at optimum levels of arousal can enhance sporting performance. Optimum levels will vary sport to sport.

introvert & extrovert personality types	An introvert is a quiet, passive, reserved, shy personality type, usually associated with individual sports performance. An extrovert is a sociable, active, talkative, out-going personality type usually associated with team sports players.
sedentary lifestyle & the consequences of this	This is a lifestyle with irregular or no physical activity. The consequences include: weight gain, poor sleep, low self-esteem, risk of heart disease, type 2 diabetes & lethargy.
factors affecting calorie requirements:	age, gender, height, energy expenditure

Can you label the bones and muscles from memory? Use 'look, cover, write, check'.



|



Sharp minds in PE: Where to look

- **'PE 4 LIFE Home Workouts' google classroom.** You will find various teacher-led warm ups / workouts, sporting challenges as well as local community sports clubs you can join.
- **Your class 'PE homework / Enrichment tasks' google classroom.** Improve your knowledge & tactical understanding in each sport by completing the sports specific enrichment tasks.
- **Sky Sports news / BBC Sport.** Keep up to date with all sporting events.
- **Watch LIVE sport.** Watching live sports will help to improve your knowledge, tactics, rules and analysis skills.

Physics

The first half of year 9 looks at the main equations used for calculating energy stores. Practise writing out the equations with the name and units used for each quantity.

E.g. Gravitational Potential energy (J) = mass (kg) x gravitational field strength (N/kg) x height (m)

Gravitational Potential Energy

$$E_g = mgh$$

GPE, E_g : Joules (J)
Mass, m : Kilograms (kg)
Gravitational Field Strength, g : N/kg
Height, h : Metres (m)

Kinetic Energy

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

Kinetic Energy, E_k : Joules (J)
Mass, m : Kilograms (kg)
Velocity, v : Metres per second (m/s)

Elastic Potential Energy

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

EPE, E_p : Joules (J)
Spring constant, k : Newton per metre (N/m)
Extension, e : Metres (m)

Power

Power is the rate of energy transferred (work done).

$$P = \frac{E}{t} \text{ or } P = \frac{W}{t}$$

Power, P : Watts (W)
Energy transferred, E : Joules (J)
Work done, W : Joules (J)
Time, t : Seconds (s)

Specific Heat Capacity

Definition of Specific Heat Capacity:

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

Change in thermal energy, E : Joules (J)
Mass, m : Kilograms (kg)
Specific Heat Capacity, c : J/kg°C
Change in temperature, ΔT : °C

Specific Heat Capacity

The specific heat capacity of a substance is the amount of energy required to raise the temperature of 1 kg of the substance by 1°C.

Efficiency

$$\text{Efficiency} = \frac{\text{useful energy output}}{\text{total energy input}} \text{ OR } \text{Efficiency} = \frac{\text{useful power output}}{\text{total power input}}$$

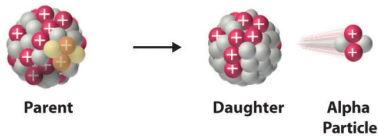
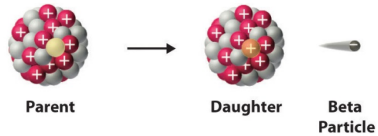
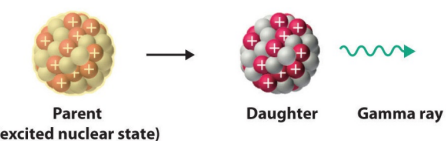
Energy transferred, E : Joules (J)
Power, P : Watts (W)

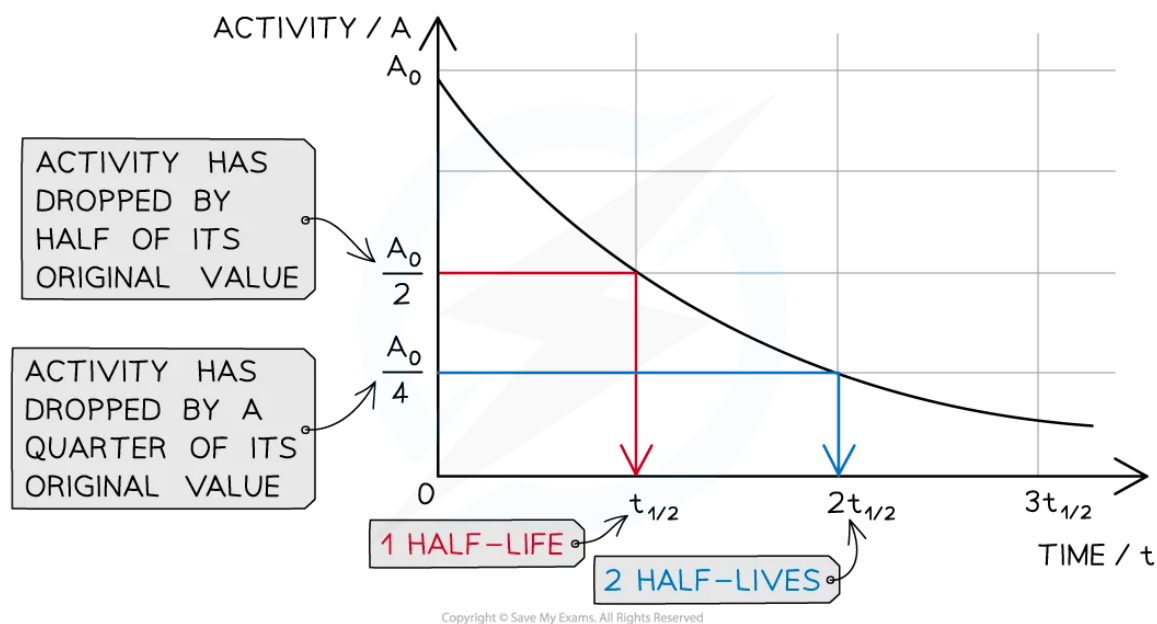
Use FIFA for all equations

Physics Calculations Using FIFA

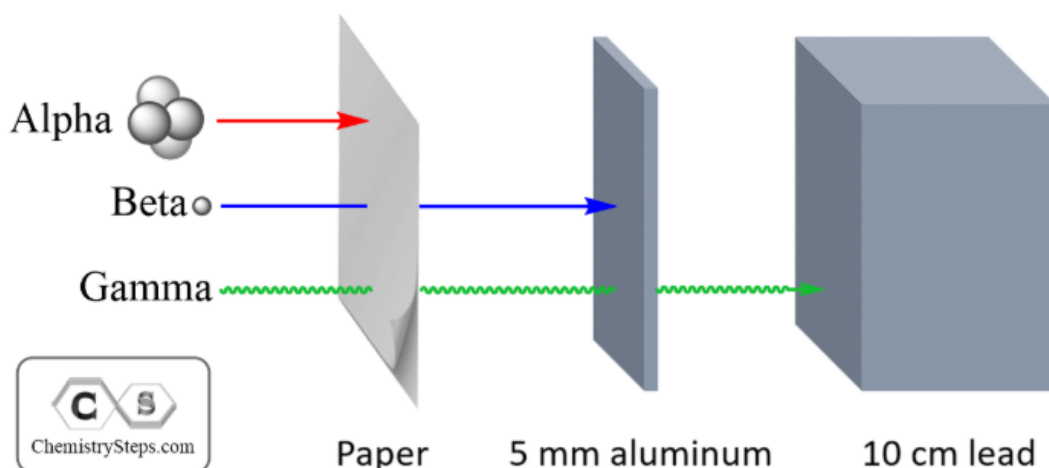
F	Formula	Recall the equation, or look it up on the data sheet
I	Insert values	Highlight the numbers in the question, and put them into the equation
F	Fine-tune	Look at what you've got. Then maybe rearrange the equation.
A	Answer	Calculator time. Don't forget the units!

The second half of year 9 physics looks at atoms and radioactivity. You need to know the properties of Alpha, Beta and Gamma radiation.

Decay Type	Radiation Emitted	Generic Equation	Model
Alpha decay	${}^4_2\alpha$	${}_Z^AX \longrightarrow {}_{Z-2}^{A-4}X' + {}^4_2\alpha$	 Parent → Daughter + Alpha Particle
Beta decay	${}^0_{-1}\beta$	${}_Z^AX \longrightarrow {}_{Z+1}^AX' + {}^0_{-1}\beta$	 Parent → Daughter + Beta Particle
Gamma emission	${}^0_0\gamma$	${}_Z^AX^* \xrightarrow{\text{Relaxation}} {}_Z^AX' + {}^0_0\gamma$	 Parent (excited nuclear state) → Daughter + Gamma ray



The Penetrating Power of Radioactive Decay Particles



Religious Studies

	Term or word	Definition
1	agnostic	Someone who believes that it is impossible to know whether God exists or not.
2	atheism	The belief that there is no God or gods.
3	conscience	An inner feeling or sense of right and wrong that guides a person's actions.
4	consequences	The results or outcomes of an action; used in ethical theories like Utilitarianism.
5	cult	A small religious group, often seen as having extreme or unusual beliefs or practices.
6	duty	A moral or legal obligation; something you are expected to do.
7	ethics	The study of moral principles that guide human behaviour; what is right and wrong.
8	Jahannam	The Islamic term for hell — a place of punishment for sinners after death.
9	Jannah	The Islamic term for paradise or heaven — eternal reward for the faithful.
10	Jehovah	A name used for God, especially in Christianity, based on the Hebrew name Yahweh.
11	morality	Principles or rules about what is right and wrong behaviour.
12	philosophy	The study of ideas about knowledge, truth, existence, and the meaning of life.
13	Rastafarianism	A religion that began in Jamaica, teaching that Haile Selassie was divine and promoting African identity and unity.
14	rebirth	The belief in being born again into a new life or body after death.
15	reincarnation	The belief that after death the soul is reborn into another body or life form.
16	ritual	A set of actions or ceremonies performed in a specific way, often for religious reasons.
17	sacred	Something regarded as holy, special, or connected with God or the divine.
18	situation ethics	A moral theory that says the most loving action is always the right one, regardless of rules.
19	speciesism	Treating one species (usually humans) as more important than others, often used in animal rights debates.
20	theism	The belief in the existence of a God or gods.
21	ritual	A set of actions or ceremonies performed in a specific way, often for religious reasons.



Sharp minds in religious studies: where to look

- Complete RS challenge cards. These can be found in your religious studies classroom.
- YouTube: 'Crash Course Philosophy' series
- Take part in the RS 'Spirited Arts' competition

Science

	Word or term	Definition
1	accuracy	Results are considered accurate if they are close to the true value.
2	anomaly	A result which does not fit with the pattern seen in the rest of the results
3	data	Information collected in an experiment
4	evidence	Information collected by observation or measurement that supports a scientific prediction or hypothesis.
5	error	The difference between a measured value and the true value.
6	random error	Readings spread about the true value. These can be larger or smaller and cannot be corrected but can be reduced.
7	systematic error	Readings vary by the same amount each time. Can be removed or corrected by repeating with a new technique or equipment.
8	zero error	Occurs when a system displays a false reading when the true value is zero.
9	hazard	Something that could cause harm
10	hypothesis	A prediction based on scientific reasoning.
11	interval	The quantity or space between readings.
12	mean	A type of average. Calculated by adding all the values up and then dividing by the number of values
13	prediction	A statement suggesting what will happen in the future.
14	precaution	Something that reduces the risk of harm
15	precision	If repeat measurements do not vary much around the mean value they are precise. If there is a large spread in repeat readings precision is low..
16	range	The maximum and minimum values of the variables.
17	risk	How likely harm is to be caused
18	repeatable	When repeating an experiment the same scientist gets the same results with the same method and equipment.
19	reproducible	When a different scientist or a different method or equipment gets the same results or trend.

20	resolution	Smallest change in what is measured that gives a detectable change on the measuring equipment..
21	true value	Value that would be obtained in an ideal measurement.
22	uncertainty	Interval within which the true value can be expected to lie. For example a measurement of a leaf of 3.5 +/- 0.2 cm means the length could be anywhere between 3.3cm and 3.7cm.
23	validity	Suitability of an experiment to answer the question being asked.
24	valid data	An experiment in which only the independent variable affects the dependent variable.
25	valid conclusion	A conclusion supported by valid data from an appropriate experiment.
26	categoric variable	Variables with values that are labels or set categories. For example, eye colour
27	continuous variable	Variables with values that are measured or counted and take any value. For example temperature or time.
28	control variable	Something that could affect the outcome and should be kept constant.
29	dependent variable	Variable that is measured.
30	independent variable	The variable that is being changed in an investigation



Sharp minds in Science: where to look

- Book: *Stuff Matters* by Mark Miodownik
A fascinating exploration of the materials that shape our world, from steel and glass to chocolate and plastic. It explains the science behind everyday materials in an accessible and engaging way.
- YouTube Channel: Veritasium
Thought-provoking science videos exploring physics, engineering, and surprising scientific ideas through demonstrations, experiments, and real-world examples.
- Activity: Institute of Physics Physics Challenge Cards
A set of problem-solving physics challenges designed to stretch students' thinking and encourage deeper understanding of scientific concepts.
- Film: *The Martian* (12A)
An exciting story about an astronaut stranded on Mars who must use science, engineering, and problem-solving to survive.
- Podcast: *The Infinite Monkey Cage*
A lively and entertaining science podcast hosted by Brian Cox and Robin Ince, exploring big scientific ideas with expert guests and humour.

Spanish

Key verbs in three tenses

Past tense (what I did)	Present tense (my routine)	Future tense (what I'm going to do)
Jugué = I played	Juego = I play	Voy a jugar = I am going to play
Comí = I ate	Como = I eat	Voy a comer = I am going to eat
Vi = I watched	Veo = I watch	Voy a ver = I am going to watch
Bebí = I drank	Bebo = I drink	Voy a beber = I am going to drink
Hice = I did	Hago = I do	Voy a hacer = I am going to do
Fui = I went	Voy = I go	Voy a ir = I am going to go
Fue = it was	Es = it is	Será = it will be
		Me gustaría = I would like

Relationships

Me llevo bien con	I get on well with
Me peleo con	I argue with
Me llevo mal con	I get on badly with
Me divierto con	I have fun with

My role model

Mi modelo a seguir es	My role model is
Cantante, escritor(a), deportista, autor(a)	Singer, writer, sportsperson, author
Me inspira porque es	He / she inspires me because he/she is
motivado/a, trabajador(a), conocido/a	Motivated, hardworking, well-known

Injuries and illnesses

Me duele la cabeza / el estómago / la garganta	I hurt my head / stomach / throat
Estoy enfermo/a, cansado/a, resfriado/a	I am ill / tired / full of a cold
Tengo hambre / sed / frío / calor	I am hungry / thirsty / cold / hot
Tienes que descansar / ver al médico	You have to rest / see the doctor

Healthy living

Estoy sano / malsano	I am healthy / unhealthy
Como una dieta equilibrada / evito el estrés	I eat a balanced diet / I avoid stress
Nunca fumo / bebo alcohol	I never smoke / drink alcohol
Ya no como chocolate / duermo mal	I no longer eat chocolate / sleep badly

Life at school

En mi colegio se debe / no se debe	In my school one must / must not
Mi asignatura favorita es	My favourite subject is
En mi opinión las reglas son estrictas / justas	In my opinion the rules are strict / fair
Voy a continuar con el español	I am going to continue with Spanish

Future jobs

Me gustaría ser / quiero ser	I would like / want to be
abogado/a, bombero/a, peluquero/a	Lawyer, firefighter, hairdresser
Me gusta ayudar a los demás	I like to help others
Me gustaría trabajar en una oficina	I would like to work in an office

Holidays - transport and accommodation

Viajo en avión / en barco / en coche / en tren	I travel by plane / by boat / by car / by train
Es rápido / lento / cómodo / barato / caro	It is fast / slow / comfortable / cheap / expensive
Me alojo en un hotel / un camping / un albergue juvenil	I stay in a hotel / on a campsite / in a youth hosted
Hay una piscina / vistas al mar / una tienda	There is a swimming pool / sea views / a shop

Holidays - weather and activities

Cuando hace buen tiempo / hace sol / hace calor	When it is good weather / it is sunny / it is hot
Voy a la playa, nado en el mar, hago turismo	I go to the beach, I swim in the sea, I go sightseeing
Cuando hace mal tiempo / hace frío / llueve	When it is bad weather / it is cold / it rains
Visito un museo / compro recuerdos	I visit a museum / I buy souvenirs

Past holidays

El año pasado / el verano pasado	Last year / last summer
Fui a Viajé en	I went to ... I travelled by
Me alojé en	I stayed in
Fui a / nadé / saqué fotos / visité	I went to / I swam / I took photos / I visited



Sharp minds in Spanish: where to look

- BBC Bitesize : <https://www.bbc.co.uk/bitesize/subjects/zfckjxs>
- Quizlet – make revision cards and learn vocabulary
- Lingo Clip – listen to music and improve your Spanish <https://lingoclip.com/es>
- Watch Spanish films and television programmes on Netflix, having subtitles in English is absolutely fine.
- Conjuguemos - practise verb conjugations and grammar points
<https://conjuguemos.com/activities/spanish/grammar/1>
<https://conjuguemos.com/activities/spanish/verb/1>

Quizzing pages**Subject:**

You could practise here, or use your rough book.

	Word or term	Definition
1		
2		
3		
4		
5		

Cover up this box for your next go!

Attempt 2

	Word or term	Definition
1		
2		
3		
4		
5		

Cover up this box for your next go!

Attempt 3

	Word or term	Definition
1		
2		
3		
4		
5		

Subject:

	Word or term	Definition
1		
2		
3		
4		
5		

Cover up this box for your next go!

Attempt 2

	Word or term	Definition
1		
2		
3		
4		
5		

Cover up this box for your next go!

Attempt 3

	Word or term	Definition
1		
2		
3		
4		
5		

Subject:

	Word or term	Definition
1		
2		
3		
4		
5		

Cover up this box for your next go!

Attempt 2

	Word or term	Definition
1		
2		
3		
4		
5		

Cover up this box for your next go!

Attempt 3

	Word or term	Definition
1		
2		
3		
4		
5		

References

www.dictionary.cambridge.org

Sharp minds...

You should record here the things you've done to really stretch yourself. Each time you complete a section, let your tutor know.

Bronze 3 Hart Points 	Subject	Add details of what you've done
	Tutor signature	

Silver 5 Hart Points 	Subject	Add details of what you've done
	Tutor signature	

Gold 10 Hart Points Letter home Reward! 	Subject	Add details of what you've done
	Tutor signature	