Wadham School

A Church of England Community School

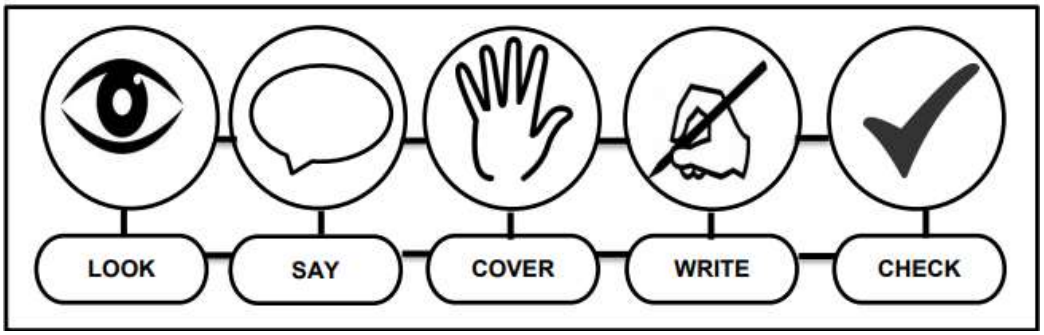
Knowledge Organisers
Year 8
Term 3 & 4
2024-2025

Name.....

Tutor group.....

"Life in all its fullness" John 10:10

Using Your Knowledge Organiser



Look-Say-Cover-Write-Check

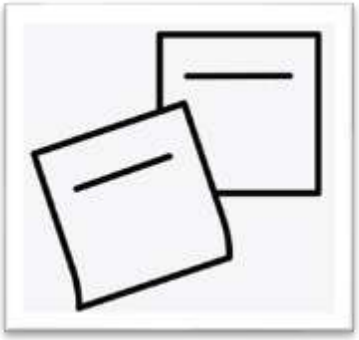
Retrieval practice using the look-say-cover-write-check technique, when done in regular small chunks, is one of the best ways you can learn relevant knowledge over time.

Working in Independent mode:

- Look at the first bullet point or sentence
- Read through it three to five times
- Cover
- Write it out exactly
- Remove and check what you wrote and tick if correct
- Repeat
- When you get it 100% right, move on to the next chunk of information

Flash Cards

Make flast cards with the definition on one side and key word on the other.

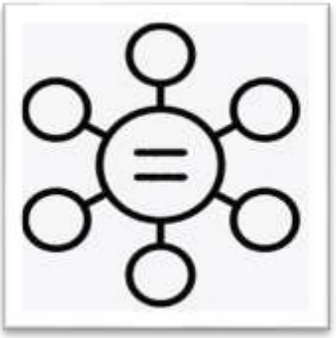


Self Quizing

Write quizzes with answers to test yourself in the future.

Mind maps

Create mindmaps linking key inforamtion you need to remember.



Art

Art –Spring Term 3 – Printing techniques

1. What is a tessellation?

An arrangement of **shapes** closely fitted together, especially of polygons in a repeated *pattern* without gaps or overlapping.

2. Key terms

Polygon	A polygon is any 2-dimensional shape formed with straight lines with at least 3 sides for example a triangle.
Pattern	A repeated decorative design.
Repeat pattern	A design arranged of the same pattern repeated.

3. Objects that work well in a tessellation

4. Tessellations in *Islamic art*

Islamic art comprises geometric prints and *tessellations* which connect to form infinitely repetitive designs. The simple designs are turned into complex patterns using *tessellation*. Geometric *patterns* are often found in Islamic art.

5. Tessellations in art and in nature

Art

Art – Spring Term 4 – Printing techniques

6. Artist to inspire your final design

Lou Tonkin is a British printmaker. From an interview with a gallery Tonkin explains what inspires her.
I am an artist & Printmaker from Cornwall. My inspiration is taken almost exclusively from my local environment, I am fascinated with nature & the hedgerows, I sit for hours looking at birds flitting in & out not necessarily to draw them in great detail (I love looking at all of my bird & insect books to do that) but to get a really good idea of the way they move & stand so that I can get the feel of them right

7. Mind mapping for your final design planning

For this part you should consider what you achieved so far in the print project and mind map possible ideas for your final design.
Below you should mind map your ideas answering the pointers below.
You should consider:

- Colours you will print with
- Shape of print, circular, square, triangular
- Subject of your print
- Details you will add
- Will you tessellate your design?
- What has inspired you?
- Do you need to take any photos of natural form objects to draw inspiration from?

8. Application task

Art activity
Using section 4 make your own geometric ***pattern*** and then repeat. You could draw a star and then closely fit stars around it to create the idea of ***tessellation***. Take inspiration from ***Islamic art*** patterns. You can use tracing paper to help tessellate and copy your design multiple times. https://www.youtube.com/watch?v=7GiKeeWSf4s This video contains a step by step guide.

Beliefs and World Views

Beliefs and Worldviews – Year 8 Term 3 & 4

Topic 2: Christian Beliefs and Practices

1	**Trinity**	One God in three persons: Father, Son & Holy Spirit
2	**Immanent**	Close to humans: Part of Space & Time

3	**Atonement**	Healing of the rift between God and humans
4	**Baptism**	Initiation into the church - symbolises cleansing of sin

5	**Revelation**	God showing himself & his plan to humans

6	**Denomination**	Different group within Christianity
7	**Interpretation**	Different way of reading & understanding the Bible
8	**Roman Catholic**	Conservative denomination led by the Pope
9	**Protestant**	Moderate denominations including Church of England
10	**Quaker**	Liberal denomination with modern views

11	**Worship**	Celebrating faith and expressing adoration for God
12	**Liturgical**	Worship that follows a set structure
13	**Charismatic**	Worship that is free and improvised
14	**Eucharist**	Act of worship: sharing bread and wine in memory of Jesus
15	**Evangelism**	Sharing the faith with the intention of converting others

Topic 3: Islam Beliefs and Practices

1	**Islam**	Arabic Religion – Worlds second largest, around 2 billion followers
2	**Muslim**	Follower of the Religion of Islam
3	**Allah**	'God' in Arabic. Often used to refer to Islamic concept of God
4	**Tawhid**	Belief in One God
5	**Shirk**	Dividing God into smaller parts

6	**Mohammed**	Most important prophet in Islam. 'Seal' of the prophets
7	**Shahadah**	Declaration of Faith – Statement spoken to become a Muslim

8	**Zakat**	Obligatory giving of 2.5% of wealth to charity
9	**Khums**	Voluntary giving of an extra 20%

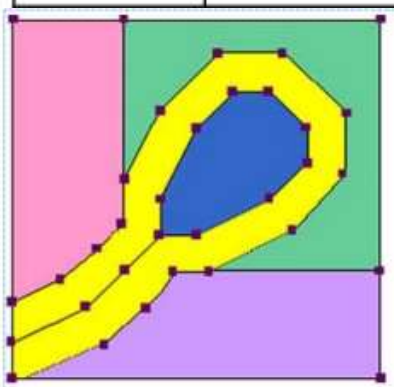
10	**Hajj**	Pilgrimage to Mecca – At least once in a Muslim's life
11	**Mecca**	Holy City in Saudi Arabia – Location of the Ka'ba
12	**Ka'ba**	Building dedicated to Allah by Mohammed
13	**Pilgrimage**	Sacred journey to a special place of religious interest

14	**Sawm**	Ritual fasting to prove dedication to God
15	**Fast**	Not eating food between sunrise and sunset
16	**Ramadan**	Month of fasting

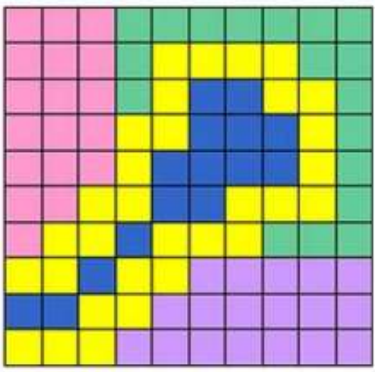
17	**Eid-up-Fitr**	Breaking of Fast – Feast and celebration at the end of Ramadan
18	**Eid-ul-Adha**	Festival of Sacrifice – Remembers Abrahams willingness to sacrifice Isaac

Computing

Keywords for Vector Graphics	
Vector Graphic	A computer made image that is made up of points, lines and curves based upon mathematical equations.
Raster Graphic	A detailed image created with pixels.
Pixel	A tiny square of colour.
Logo	A symbol that is used to represent an organisation or product.
Union	An operation used to combine two or more paths to create a single path.
Intersection	An operation use to create a single path from the overlapping portion of two paths.
Scalable	When an object or image is able to be made bigger or smaller.
Path	A line or a shape used to create vector graphics.
SVG	Scalable Vector Graphic



Vector



Raster

Vector	Raster
Made up with paths	Made up with pixels
Simple images	Detailed/complex images
Maintains image quality when scaled	Loses image quality when scaled
Used for logos, icons and illustrations	Used for real photos

Year 8 Design and Technology

	Keyword	Key information
1	Fibre	Fibres are hair like strands that are natural or synthetic.
2	Natural Fibres	Natural fibres come from plant, animal or insect sources.
3	Synthetic Fibres	Synthetic fibres are man-made.
4	Yarn	Fibres are spun to create long threads called yarns.
5	Fabric	Fabric is produced by yarns which are knitted or woven together.
6	Stencil	A thin piece of material that has a design cut away from it.
7	Craft Knife	A very sharp knife used to cut paper and cardboard.
8	Iron	A handheld electrical item used to smooth the creases in fabric.
9	Cutting Mat	Protects the surface below the material from been damaged.
10	Marimekko	A Finnish textiles company founded in 1951.
11	Surface Design	The art that is applied to surfaces, such as fabric, wallpaper, home décor and clothes.
12	Pattern	A repeated decorative design.
13	Placement	The location of a design on an item.
14	Motif	A significant icon or recurring idea in a design.
15	Block repeat	The motif is repeated in a basic grid design.
16	Half drop repeat	The vertical repeat drops exactly half of the original motif.
17	Brick repeat	The horizontal repeat moves across exactly half of the original motif, like the bricks on a house.
18	Random repeat	Motifs are placed randomly and have no particular arrangement.
19	Embellishment	Decorative detail which is added for a more interesting aesthetic appeal. Sequins are an example of an embellishment.
20	Embroidery	Using stitches to form a decorative design.
21	Smart Materials	Materials that change in response to an external condition such as temperature or light.
22	Thermochromic Ink	An example of a smart material. The colour of this ink changes when the temperature is increased or decreased.

A. Drama Key Words

Body language	Body language is communication by movement or position, particularly facial expressions, gestures and the relative positions of characters.
Facial expressions	conveys an emotion that tells us expressions about the character and the way they react to a situation.
Gesture	a body movement that conveys meaning, think of a wagging finger to tell someone off.
Proxemics	how the actors/characters are placed on a stage. The distance or level between character/actors shows their relationships and feelings.
Levels	create visual interest. Levels can be used to suggest status - meaning the power or authority one character has over another
Corpsing	To lose focus and come out of role often to giggle.
Still Image/ Freeze Frame	A still image is a frozen moment on stage where the characters stay still to clearly stop the play and show the audience a moment in time. It is often used to highlight something important that has happened.
Mime	using movements of your hands and body, and expressions on your face, without speech, to communicate emotions and actions or to tell a story
Point of focus	What you would like your audience to notice in a scene

The Five Things:
1- Facial Expressions
2 – Eye contact
3 – Create one point of focus
4 – Use Levels
5 – Where are your audience

English

ANALYSIS	
Argument	The writer presents [topic] to…
Neat evidence	The phrase '…' shows…
Additional	Additionally, the phrase '…' adds to…
Language	The imagery suggests…
Your evaluation	A reader may also understand...
Structure and form	Structurally, the... tone emphasises...
Intentions of writer	The writer's intentions may have been to…
Society and context	Contextually, the writer may be reflecting…

POETIC POEMS	Definition
Personification	Giving something human characteristics
Oxymoron	Contradictory phrase
Enjambment	Continuing a line of poetry
Tone	Mood or atmosphere
Imagery	Descriptive language
Contrast	Very different things put together
Perspective	Viewpoint
Onomatopoeia	Words that sound like the thing
Extended	Carrying on
Metaphor	Saying something is something else
Simile	Saying something is like something else

A PERSUADER	Definition
Alliteration	Repeating same sound at starts of words
Points	Clear reasons to add to your argument
Exaggeration	Overstating
Repetition	Saying the same thing over and over
Statistics	Using numbers to represent facts
Unique ideas	Unusual or ways of approaching an issue
Anecdote	A short story used to make a point
Direct address	Talking to the audience
Emotive language	Appealing to people's feelings
Rhetorical questions	Questions not intended to be answered.

Gothic Fiction

Key words	Definition
Pathetic fallacy	the weather reflects the mood or feelings of the character.
Juxtaposition	*two contrasting ideas used together.*
Foreshadow	to hint at future events.
Euphemism	a writer wishes to describe some graphic or offensive event using milder imagery or phrasing.
Denotation	is literally what you can see or tell. For example, it is a picture of a cross.
Connotations	are the emotions/or thoughts we associate/feel when we see an image or a word. For example, the cross infers that someone has died here. It makes the author feel apprehensive.
Symbolism	things in the story have a deeper meaning under the surface.
Protagonist	the lead character in a narrative. It is normally someone who is heroic.
Antagonist	a character who opposes the main character.

English

ANALYSIS	
Argument	The writer presents [topic] to…
Neat evidence	The phrase '…' shows…
Additional	Additionally, the phrase '…' adds to…
Language	The imagery suggests…
Your evaluation	A reader may also understand...
Structure and form	Structurally, the... tone emphasises...
Intentions of writer	The writer's intentions may have been to…
Society and context	Contextually, the writer may be reflecting…

POETIC POEMS	Definition
Personification	Giving something human characteristics
Oxymoron	Contradictory phrase
Enjambment	Continuing a line of poetry
Tone	Mood or atmosphere
Imagery	Descriptive language
Contrast	Very different things put together
Perspective	Viewpoint
Onomatopoeia	Words that sound like the thing
Extended	Carrying on
Metaphor	Saying something is something else
Simile	Saying something is like something else

A PERSUADER	Definition
Alliteration	Repeating same sound at starts of words
Points	Clear reasons to add to your argument
Exaggeration	Overstating
Repetition	Saying the same thing over and over
Statistics	Using numbers to represent facts
Unique ideas	Unusual or ways of approaching an issue
Anecdote	A short story used to make a point
Direct address	Talking to the audience
Emotive language	Appealing to people's feelings
Rhetorical questions	Questions not intended to be answered.

Romeo and Juliet

Key words	Definition
Sonnet	A type of love poem with 14 lines.
Hierarchy	A system where people are ranked according to status or authority
Destiny /fate	the development of events outside a person's control, regarded as predetermined by a supernatural power:
Prologue	A separate section at the beginning of a play that introduces themes, ideas and plot
Pathos	creating a feeling of pity, sympathy or sadness.
Tension	a state of stress, strain or expectation of something happening.
Soliloquy	A speech in a play delivered only for the audience to hear.
Tragedy	a play dealing with tragic events and having an unhappy ending, especially one concerning the downfall of the main character:
Conflict	Serious disagreement or argument, usually long-running
Patriarchy	A male dominated society.

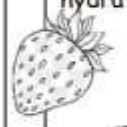
Food

Year 8 Food

1	Nutrients	Food and drinks contains different substances that are needed for health. These are nutrients and water
	Macro-nutrients	Nutrients needed in large amounts to provide energy **Carbohydrates, protein, fats**
	Micro-nutrients	Nutrients needed in the diet in very small amounts- **Vitamins and minerals**
	Vitamins	**Fat-soluble** vitamins can be stored in the body: **Vitamin A** - dim light vision, healthy skin and eyes, resistance to infection; Leafy green vegetables, Orange/ yellow vegetables **Vitamin D** – absorbs calcium from foods to keep bones and teeth healthy: the sun, oily fish, meat, eggs
		Water-soluble vitamins cannot be stored in the body so are required daily **B vitamins: thiamine - Releases energy from food** **B1 Thiamine**: energy from carbohydrate and the nervous system. **B2 Riboflavin**: energy from protein, carbohydrate and fat. Transport and use of iron in the body **B3: Niacin**: required for the normal function of the skin, mucous membranes and nervous system **Vitamin C** - Keeps connective tissue healthy, Helps the body absorb iron: Oranges, blackcurrants, broccoli, red/ green lentils
	Minerals	Inorganic substances such as: Calcium, sodium and iron.
		Calcium - maintenance of bones and teeth, blood clotting, normal muscle function: milk, cheese and other dairy products **Sodium (salt)-** regulating the amount of water and other substances in the body: Breads and rolls, Pizza, Sandwiches, cured meats, Soups, tacos. **Iron** - formation of haemoglobin in red blood cells. Red blood cells carry oxygen around the body: meat, green leafy vegetables, pulses
2	Functions	**Aeration** (foam) e.g. whisking egg whites; **thicken sauces** (coagulation) e.g. egg custard; **Binding (coagulation)** e.g. fishcakes; **form structures**, e.g. gluten development in bread; **gel**, e.g. lime jelly **Glazing**- (coagulation) egg is used to give shing golden colour **emulsifying – mayonnaise**; **Coating (coagulation)** – covering with breadcrumbs, fish; adding colour/flavour/moisture/nutrients.
3	Food choice	People choose to eat different food for many different reasons: • **individual energy and nutrient needs;** requirements depend on age, gender, activity level, genes, body size • **Energy needs also depend on activity levels** • **diet and health;** People might have their own or their family's health concerns or for medical reasons. • **religion and culture** - People choose to eat or avoid certain foods according to their religious beliefs • **cost of food;** • **food availability-** seasonal food • **time of day and occasion;** • **food preferences;** food taste, odour, appearance, shape, colour • **social and economic considerations** – As consumers we are influenced by those around us, location, occupation, lifestyle, education, knowledge • **Environmental and ethical considerations** -personal beliefs about what is morally right and wrong. • **Food provenance** - Where food is grown, caught or reared, and how it was produced. • **advertising and other point of sale information**

Food

Year 8 Food

4	Dietary needs	Nutritional needs vary depending on: **life stages** – pregnancy, infancy and childhood, adolescence, adulthood, later adulthood; **medical conditions** – diabetes (type 1 or 2), anaemia, lactose intolerance, coeliac disease; **culture** – religious beliefs, vegans/vegetarians, lifestyle choices **Adolescence** – a time of rapid growth and development, the requirements for **calcium** and **phosphorus** is fairly high. Boys need more protein and energy than girls for growth. Girls need more iron than boys to replace menstrual losses. Too little iron can lead to iron deficiency anaemia. Girls need more iron than boys to replace menstrual losses – 14.8mg p/day.
	School food plan	Standards for all food served in schools. A wide range of foods across the week must include: plenty of fruit and vegetables • plenty of unrefined starchy foods • some meat, fish, eggs, beans and other non-dairy sources of protein • some milk and dairy foods • a small amount of food and drink high in fat, sugar and salt
5	Carbo-hydrates   	**Carbohydrates** provides energy for the body. Too much can lead to obesity. **FRUIT SUGARS** (glucose) (simple carbohydrate) found naturally in the cell walls of fruit or vegetables. **FREE SUGARS** (added to food) table sugar, jam, confectionary, honey, syrups, unsweetened fruit juice. Too much sugar can lead to tooth decay **STARCH** (complex carbohydrate) made up of many sugar molecules (potatoes, rice, pasta, bread) **DIETARY FIBRE** – complex carbohydrate found in the cell walls of plants; Fruits, vegetables, cereals (wholegrains) beans; lentils; nuts, seeds. Keeps the digestive system healthy. Can reduce the chance of getting heart disease and type 2 diabetes. Recommendations – 30g adult per day.
6	Function of bread ingredients: 	**Dough**- mixture of dry ingredients that is mixed, kneaded and baked **Flour** (Gluten is a protein found in the wheat). Helps create the structure, softness and strength of the dough **yeast** Yeast is a biological raising agent, a single celled fungus plant the raising agent used in bread, doughnuts and currant buns **salt** (to add taste and aid proving); **prove** (leaving dough to rise) **water** (assists with fermentation - producing Co2 + alcohol and helping dough to rise. **fat** (sometimes added to make the loaf lighter and airier and extend its shelf life);
		Fermentation – The yeast uses the flour, sugar and water to **ferment**, and to produce carbon dioxide and alcohol **Temperature / moisture** - makes sure it is a soft dough. Use tepid/warm/blood heat liquid (37°C). Liquid is usually water but could be milk, water and milk mix, other liquids. Bread dough needs **time** to rise in first instance, yeast has to have time to grow, double in size. After shaping prove bread (another rising) before it goes into oven, it will almost double again. **Warm conditions** allow yeast to grow, carbon dioxide produced and bread rises slowly. Baking – in hot oven 220°C, yeast grows rapidly so bread rises rapidly. Yeast is killed by high temperature. Dough sets in the risen state.

Year 8 French Term 3: Vive les vacances (1)!

Les pays	*Countries*
1. la France	*France*
2. la Belgique	*Belgium*
3. la Suisse	*Switzerland*
4. l'Angleterre	*England*
5. l'Écosse	*Scotland*
6. l'Italie	*Italy*
7. l'Espagne	*Spain*
8. l'Allemagne	*Germany*
9. le Pays de Galles	*Wales*
10. l'Irlande	*Ireland*
11. le Portugal	*Portugal*
12. la Pologne	*Poland*
13. l'Ukraine	*Ukraine*
14. la Hongarie	*Hungary*

En vacances	*On holiday*
15. J'ai une semaine de vacances.	*I have a week of holiday.*
16. C'est pour Noël.	*It's for Christmas.*
17. C'est pour Pâques.	*It's for Easter.*
18. C'est pour les grandes vacances.	*It's for the summer holidays.*
19. C'est en octobre.	*It's in October.*
20. Je suis en vacances…	*I am on holiday…*
21. au bord de la mer	*at the seaside*
22. à la montagne	*in the mountains*
23. à la campagne	*in the countryside*
24. en colonie de vacances	*at a holiday camp*
25. chez mes grand—parents	*at my grandparents' home*

Phonics Focus:	
silent final consonant ***trois***	**[a] = /a/** ***avion***
[u] = /oo/ ***salut***	**[on] [en] [an] = /on/** ***serpent***
[é] [er] [ez] = /ay/ ***vélo***	**[in] [un] = /euhn/** ***numéo un***

Les opinions	*Opinions*
26. C'est…	*It's…*
27. amusant	*fun*
28. ennuyeux	*boring*
29. intéressant	*interesting*
30. sympa	*nice*
31. nul	*rubbish*
32. un peu	*a bit*
33. assez	*quite*
34. très	*Very*
35. complètement	*completely*
36. C'est comment?	*What is it like?*

J'ai visité…	*I visited…*
37. le château	*the castle*
38. le lac	*the lake*
39. le musée	*the museum*
40. le parc	*the park*
41. le stade	*the stadium*
42. la cathédrale	*the cathedral*
43. la mosquée	*the mosque*
44. la chocolaterie	*the chocolate shop*
45. d'abord	*first of all*
46. ensuite	*next*
47. puis	*then*
48. après	*after*
49. finalement	*finally*

Vital verb: *visiter (to visit)*	
Present:	**Perfect (past):**
*Je visit**e***	*J'**ai** visit**é***
*Tu visit**es***	*Tu **as** visit**é***
*Il/elle/on visit**e***	*Il/elle/on **a** visit**é***
*Nous visit**ons***	*Nous **avons** visit**é***
*Vous visit**ez***	*Vous **avez** visit**é***
*Ils/elles visit**ent***	*Ils/elles **ont** visit**é***

Year 8 French Term 4: Vive les vacances (2)!

Qu'est-ce que tu as fait?	*What did you do?*
1. J'ai joué au tennis.	*I played tennis.*
2. J'ai joué au foot.	*I played football.*
3. J'ai mangé des glaces.	*I ate ice creams.*
4. J'ai mangé une pizza.	*I ate pizza.*
5. J'ai écouté de la musique.	*I listened to music.*
6. J'ai acheté des baskets.	*I bought some trainers.*
7. J'ai acheté un te—shirt.	*I bought a t-shirt.*
8. J'ai acheté des BD.	*I bought some comics.*
9. J'ai regardé des clips vidéo.	*I watched video clips.*
10. J'ai nagé dans la mer.	*I swam in the sea.*
11. J'ai retrouvé Léo.	*I met up with Leo.*
12. J'ai traîné au lit.	*I hung around in bed.*
13. J'ai dormi.	*I slept.*
14. J'ai visité un parc d'attractions.	*I visited a theme park.*
15. J'ai bu un coca.	*I drank a cola.*
16. J'ai vu un spectacle.	*I saw a show.*
17. J'ai vu mes personnages préférés.	*I saw my favourite characters.*
18. J'ai fait une balade en bateau.	*I went on a boat ride.*
19. J'ai fait les manèges.	*I went on the rides.*
20. J'ai pris des photos.	*I took photos.*
21. Je n'ai pas mangé de glaces.	*I didn't eat any ice cream.*
22. Je n'ai pas acheté de souvenirs.	*I didn't buy any souvenirs.*
23. C'était…	*It was…*

Phonics Focus:	
silent final consonant ***trois***	**[a] = /a/** ***avion***
[u] = /oo/ ***salut***	**[on] [en] [an] = /on/** ***serpent***
[é] [er] [ez] = /ay/ ***vélo***	**[in] [un] = /euhn/** ***numéro un***

Le transport	*Transports*
24. J'ai voyagé…	*I travelled…*
25. en avion	*by plane*
26. en bateau	*by boat*
27. en car	*by coach*
28. en train	*by train*
29. en voiture	*by car*
30. C'était…	*It was*
31. confortable	*comfortable*
32. rapide	*quick*
33. pratique	*practical*
34. bon marché	*cheap*
35. lent	*slow*
36. cher	*expensive*

Tu es allé(e) où?	*Where did you go?*
37. Je suis allé(e) en Espagne.	*I went to Spain.*
38. Je suis allé(e) en Grèce.	*I went to Greece.*
39. Je suis allé(e) au Maroc.	*I went to Morocco.*
40. Je suis allé(e) aux État—Unis.	*I went to the USA.*
41. avec ma famille/mes amis.	*with my family/friends.*

Le temps	*Weather*
42. Il faisait beau/mauvais.	*It was good/bad weather.*
43. Il faisait chaud/froid.	*It was hot/cold.*
44. Il y avait du soleil/vent.	*It was sunny/windy.*
45. Il pleuvait/neigait.	*It rained/snowed.*

Vital verb: *aller (to go)*	
Present:	**Perfect (past):**
Je ***vais***	*Je* ***suis*** *allé(****e****)*
Tu ***vas***	*Tu* ***es*** *allé(****e****)*
Il/elle/on ***va***	*Il/elle/on* ***est*** *allé(****e****)*
*Nous all****ons***	*Nous* ***sommes*** *allé(****e****)****s***
*Vous all****ez***	*Vous* ***êtes*** *allé(****e****)*
Ils/elles ***vont***	*Ils/elles* ***sont*** *allé(****e****)s*

Geography

Topic

Development

Development categories. Measuring development using data.
Opportunities and barriers for development.
Issues and challenges for developing countries.
Focus on Brazil.

Key Words

Development
The progress of a country in terms of economic growth, the use of technology and human welfare.

Development gap
The difference in standards of living and wellbeing between the world's richest and poorest countries (between HICs and LICs).

Gross national income (GNI)
A measurement of economic activity that is calculated by dividing the gross (total) national income by the size of the population. GNI takes into account not just the value of goods and services, but also the income earned from investments overseas.

Human Development Index (HDI)
A method of measuring development in which GDP per capita, life expectancy and adult literacy are combined to give an overview. This combined measure of development uses economic and social indicators to produce an index figure that allows comparison between countries.

International aid
Money, goods and services given by the government of one country or a multilateral institution such as the World Bank or International Monetary Fund to help the quality of life and economy of another country.

Life expectancy
The average number of years a person might be expected to live.

Literacy rate
The percentage of people who have basic reading and writing skills.

Squatter settlement
An area of poor-quality housing, lacking in amenities such as water supply, sewerage and electricity, which often develops spontaneously and illegally in a city in an LIC.

Development
https://www.bbc.com/bitesize/guides/zvp39j6/revision/1
https://m.youtube.com/channel/UCFRoQ_PH8Ho5bUQb443PPqw/featured

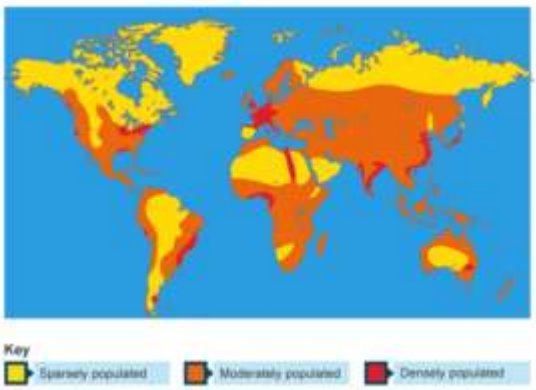
Brazil
https://www.youtube.com/watch?v=c3BRTlHFpBU
https://www.bbc.co.uk/news/science-environment-18552512
https://www.youtube.com/watch?v=Lz1rpodrwC4
https://www.bbc.co.uk/news/world-latin-america-27635554

Geography

Population Knowledge Organiser

Population density

Refers to the number of people living in an area. It is worked out by dividing the number of people in an area by the size of the area. If there are few people living in an area this means that it is **sparsely populated**, while a **densely populated** area has many people living there.



Factors affecting population density

Factors that can lead to dense populations include:
•flat or gently sloping land
•mild climate
•good soils
•lowland
•water
•good transport and communication links, e.g. ports
•places to work
•resources, e.g. coal, oil

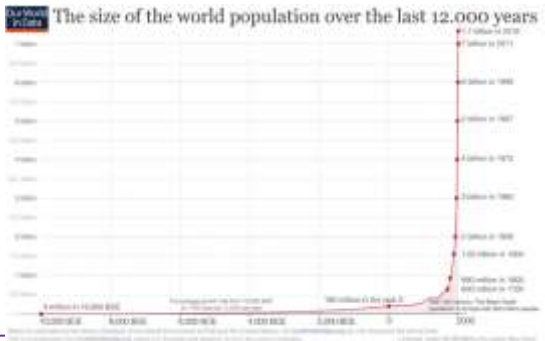
Factors that can lead to sparse populations include:
•steep slopes
•harsh climate - very hot or very cold
•dense forest
•dry conditions
•isolated areas with poor transport links
•few jobs
•lack of resources

Population changes

The world's population does not stay the same. During the 1st century AD, the world population was about 300,000 people. The current population is over 7 billion, and most of the growth has taken place within the last 100 years.

What causes population to change?
•births
•deaths
•migration

Overtime, as healthcare has improved, death rates have continued to fall. The introduction of vaccines has also helped to protect people from diseases.

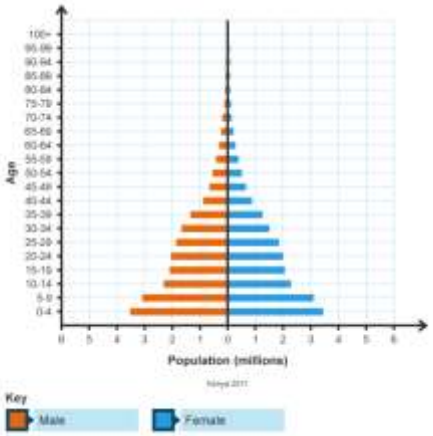


Population Pyramids

Population structures are shown using population pyramids. A population structure refers to the number of males and females in each age group that are found within a specific place.

What does this mean?
•A wide base means there are lots of young people, and suggests a **high birth rate**.
•A narrow base means a smaller proportion of young people, suggesting a **low birth rate.**
•A thin middle, short pyramid means a smaller ageing population, suggesting that there is not a **long-life expectancy.**

While improvements in healthcare have historically lowered death rates, increased access to contraception has lowered birth rates.



Year 8 German Term 3: Ich liebe Ferien (1)!

Früher und Heute	*Then and today*
1. Die Stadt ist/war…	*The town is/was…*
2. alt/modern	*old/modern*
3. klein/groß	*small/big*
4. schön/industriell	*beautiful/industrial*
5. laut/ruhig	*loud/quiet*
6. Die Stadt hat/hatte…	*The town has/had…*
7. Es gibt/gab…	*There is/are…*
8. einen Strand	*a beach*
9. einen Marktplatz	*a town square*
10. einen Hafen	*a harbour*
11. eine Arena	*an arena*
12. eine Skatehalle	*a skate hall*
13. ein Einkaufszentrum	*a shopping centre*
14. ein Stadion	*a stadium*

Länder	*Countries*
15. Deutschland	*Germany*
16. Belgian	*Belgium*
17. die Schweiz	*Switzerland*
18. England	*England*
19. Schottland	*Scotland*
20. Italien	*Italy*
21. Spanien	*Spain*
22. Frankreich	*France*
23. Wales	*Wales*
24. Irland	*Ireland*
25. Portugal	*Portugal*
26. Polen	*Poland*
27. Ukraine	*Ukraine*
28. Ungarn	*Hungary*

Phonics Focus:	
[w] = /v/	[ch] = /k + ch/
***W**ild**w**assersport*	***Bu**ch (hard) / i**ch** (soft)*
unvoiced [b]	unvoiced [d]
***hal**b*	***kin**d*

Wo hast du gewohnt?	*Where did you stay?*
29. Ich habe…gewohnt.	*I stayed…*
30. in einem Hotel	*in a hotel*
31. in einem Ferienhaus	*in a holiday house*
32. in einem Wohnwagen	*in a caravan*
33. in einer Jugenherberge	*in a youth hostel*
34. auf einem Campingplatz	*on a campsite*
35. bei Freunden	*with friends*

Was hast du gemacht?	*What did you do?*
36. Ich habe viele Sachen gemacht.	*I did a lot of things.*
37. Ich habe…/Wir haben…	*I/we…*
38. …Musik gehört.	*…listened to music.*
39. …Volleyball gespielt.	*…played volleyball.*
40. …einen Bootsausflug gemacht.	*…did a boat trip.*
41. …viele Souvenirs gekauft.	*…bought lots of souvenirs.*
42. …viel Fisch gegessen.	*…ate lots of fish.*
43. …die Kirche gesehen.	*…saw the church.*
44. …ein Buch gelesen.	*…read a book.*
45. Ich bin zu Hause geblieben.	*I stayed at home.*

Vital verb: ***wohnen (to live/stay)***	
Präsens (present)	*Perfekt (past)*
*Ich wohn**e***	*Ich **habe**…**gewohnt.***
*Du wohn**st***	*Du **hast**…**gewohnt.***
*Er/sie wohn**t***	*Er/sie **hat**…**gewohnt.***
*Wir wohn**en***	*Wir **haben**…**gewohnt.***
*Sie/sie wohn**en***	*Sie/sie **haben**…**gewohnt.***

Year 8 German Term 4: Ich liebe Ferien (2)!

Was hast du gemacht?	*What did you do?*
1. Ich habe viele Sachen gemacht.	*I did a lot of things.*
2. Ich habe.../Wir haben…	*I/We…*
3. Musik gehört.	*listened to music.*
4. Volleyball gespielt.	*played volleyball.*
5. einen Bootsausflug gemacht.	*did a boat trip.*
6. viele Souvenirs gekauft.	*bought lots of souvenirs.*
7. viel Fisch gegessen.	*ate lots of fish.*
8. die Kirche gesehen.	*saw the church.*
9. ein Buch gelesen.	*read a book.*
10. Ich bin zu Hause geblieben.	*I stayed at home.*

Was hast du sonst gemacht?	*What else did you do?*
11. Ich bin…gegangen.	*I went…*
12. an den Strand	*to the beach*
13. in die Stadt	*into town*
14. windsurfen	*windsurfing*
15. kitesurfen	*kite surfing*
16. schwimmen	*swimming*
17. Ich bin…gefahren.	*I went…*
18. Wakeboard	*wakeboarding*
19. Snowboard	*snowboarding*
20. Ski	*skiing*
21. Ich habe Snowtubing gemacht.	*I went snowtubing.*
22. Ich habe Eistennis gespielt.	*I played ice tennis.*
23. Es war…	*It was…*

Phonics Focus:	
[j] = /y/ ***j**ung*	[z] = /ts/ ***Z**eug*
[ge] = /guh/ ***ge**kauft*	[ß] = /ss/ ***groß***
[ig] = /ik/ ***neblig***	[sch] = /sh/ ***sch**neit*

Was hast du gewohnt?	*Where did you stay?*
24. Ich habe…gewohnt.	*I stayed…*
25. in einem Hotel	*I/We…*
26. in einem Ferienhaus	*listened to music.*
27. in einem Wohnwagen	*played volleyball.*
28. in einer Jugendherberge	*did a boat trip.*
29. auf einem Campingplatz	*bought lots of souvenirs.*
30. bei Freunden	*ate lots of fish.*

Wie bist du gefahren?	*How did you get there?*
31. Ich bin…gefahren.	*I travelled…*
32. mit dem Flugzeug	*by plane*
33. mit dem Schiff	*by boat*
34. mit dem Reisebus	*by coach*
35. mit dem Zug	*by train*
36. mit dem Auto	*by car*
37. Ich bin zu Fuß gegangen.	*I walked.*
38. Die Reise war…	*The journey was…*
39. lang/kurz	*long/short*
40. langweilig	*boring*
41. interessant	*interesting*

Das Wetter	*Weather*
42. Es war….	*It was…*
43. sonnig/wolkig	*sunny/cloudy*
44. heiß/kalt	*hot/cold*
45. windig/neblig	*windy/foggy*
46. Es hat geregnet/geschneit.	*It rained/snowed.*

Vital verb: *fahren (to go)*	
Präsens	**Perfekt (past):**
Ich fahre	*Ich bin…gefahren.*
Du fährst	*Du bist…gefahren.*
Er/sie fährt	*Er/sie ist…gefahren.*
Wir fahren	*Wir sind…gefahren.*
Sie/sie fahren	*Sie/sie sind…gefahren.*

History

Year 8 History: Knowledge Organiser Term 3 + 4, The Industrial Revolution

Key Word	Definition
1. Back-to-Back Housing	Name given to houses that had no backs. Two houses stuck together back-to-back.
2. Cholera	A water born disease that killed 1000s, especially the young.
3. Excrement	Human waste, faeces.
4. Industrial Revolution	The period between 1750 -1900 (approx.) where there was a significant rise in factories powered by wheels and engines. The result was increased production and a move from a mainly rural society to an urban one.
5. Midden	The name given to the place where people would put their excrement.
6. Miasma	The name given to Bad air (bad smells) believed at the time to cause disease to spread.
7. Open sewer	A drain usually in the middle of the road where people dumped their waste.
8. Overcrowding	When a house has too many people living in it
9. Pauper	A poor person with no job
10. Poor Ventilation	Lack of good clean air in a building
11. Privy	Old word for toilet
12. Rookery	An area of a town that was full of poverty and crime.
13. Sanitation	Is the system of drains, sewers and water pipes that keep our towns clean. Therefore, poor sanitation means a lack of these things.
14. Textiles Industry	Making and selling cloth – this became the biggest industry across Britain
15. Transportation	The process of sending people found guilty of crime to another country, e.g. Australia
16. Tuberculosis (TB)	A killer lung disease in the 19th Century
17. Typhoid	A disease spread by body lice
18. Workhouse	The place all people had to go if they lost their job and could not feed their families
Jack the Ripper	
19. Leather Apron or Whitechapel Murderer	Common names used for Jack the Ripper at the times of the murders.
20. Peeler or Bobby	Name given to the early police
21. Scapegoats	Blaming a person/group of people for wrongdoing when it is not their fault
22. Sensationalist	Newspapers presenting stories intended to provoke a reaction from the public.
23. Serial Killer	A person that kills multiple people – like Jack the Ripper
24. Suspect	A person that it is believed might have committed a crime.
25. Technology	machinery and equipment developed to help make things easier.
26. Victim	The person who was the target/suffered due to a crime.
27. Watchmen	A person or group employed to look out for, and deter, criminal activity.
28. Whitechapel	An area of East London – where Jack the Ripper committed his crimes.

Maths: 8.07 Brackets, equations & inequalities…..

Key words	
Simplify	grouping and combining similar terms
Substitute	replace a variable with a numerical value Equivalent: something of equal 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 who values showing if one is greater than, less than or I equal to another

Sparx codes for this topic	
M957	Form expressions
M106	Directed numbers
M792	Multiply single brackets
M100	Factorise into a single bracket
M902	Solve equations with brackets
M118	Simple inequalities
U337	Form and solve inequalities

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 → t + 4

8 less than k → k - 8

Only similar terms can be grouped together

e.g. Find the perimeter of this shape

(Perimeter = length around outside of shape)

t + 2t + 1 + t + 2t + 1 → 6t + 2

Directed numbers

+ + → +

- - → +

+ - → -

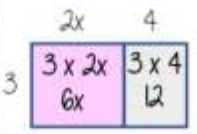
- + → -

e.g. a = -5 and b = 2

a^2 = a x a = -5 x – 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

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

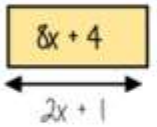
An equation where both sides have variables that cause the same answer includes ≡

Formula

A rule written with all mathematical symbols

e.g. area of a rectangle A = b x h

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

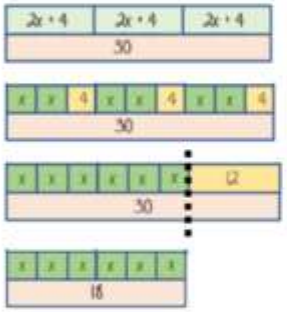
8x + 4 ≡ 4 (2x + 1)

Note

8x + 4 ≡ 2(4x + 2)

This is factorised but the HCF has not been used

Solve equations with brackets 3 (2x + 4) = 30



3 (2x + 4) = 30

Expand the brackets

6x + 12 = 30

- 12 - 12

6x = 18

- 6 - 6

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

x = 3

Simple Inequalities

< less than

≤ Less than or equal to

> More than

≥ 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 ≤ 20

"my value + 2 is less than or equal to 20"

x ≤ 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 → x3 → +2 → 11

3x + 2 > 11

Solve

x ← -3 ← -2 ← 11

x > 3

Check

This would suggest any value bigger than 3 satisfies the statement

3 x 3 + 2 = 11 ✓ 10 x 3 + 2 = 32 ✓

Maths: 8.08 Sequences…..

Key words	
Sequence	items or numbers put in a pre-decided order Term: a single number or variable
Position	the place something is located
Linear	the difference between terms increases or decreases (+ or -) by a constant value each time
Non-linear	the difference between terms increases or decreases in different amounts, or by x or ÷
Difference	the gap between two terms
Arithmetic	a sequence where the difference between the terms is constant
Geometric	a sequence where each term is found by multiplying the previous one by a fixed nonzero I number

Sparx codes for this topic	
M981	Linear and Non-Linear Sequences
M241	Sequences in a table and graphically
M166	Sequences from algebraic rules
U958	Complex algebra rules
U498	Finding the algebraic rule

Linear and Non Linear Sequences

Linear Sequences – increase by addition or subtraction and the same amount each time

Non-linear Sequences – do not increase by a constant amount – quadratic, geometric and Fibonacci

- Do not plot as straight lines when modelled graphically
- The differences between terms can be found by addition, subtraction, multiplication or division

Fibonacci Sequence – look out for this type of sequence

0 1 1 2 3 5 8 ...

Each term is the sum of the previous two terms

Sequences from algebraic rules

This is substitution!

$3n + 7$

This will be linear - note the single power of n. The values increase at a constant rate

$3n^2 + 7$

This is not linear as there is a power for n

$2n - 5$ → Substitute the number of the term you are looking for in place of 'n'

e.g
1st term = 2 (1) – 5 = -3
2nd term = 2 (2) – 5 = -1
100th term = 2 (100) – 5 = 195

Checking for a term in a sequence

Form an equation

Is 201 in the sequence $3n - 4$?

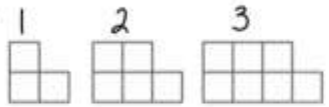
$3n - 4 = 201$ ← Term to check

Algebraic rule

Solving this will find the position of the term in the sequence. ONLY an integer solution can be in the sequence

Sequence in a table and graphically

Position: the place in the sequence



3 5 7

"The term in position 3 has 7 squares"

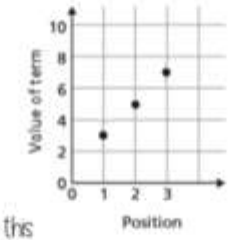
Term: the number or variable (the number of squares in each image)

In a table

Position	1	2	3
Term	3	5	7

+2 +2

Graphically



Because the terms increase by the same addition each time this is **linear** – as seen in the graph

Complex algebraic rules

Misconceptions and comparisons

$2n^2$

2 times whatever n squared is

e.g
1st term = 2 x 1^2 = 2
2nd term = 2 x 2^2 = 8
100th term = 2 x 100^2 = 2000

$(2n)^2$

2 times n then square the answer

e.g
1st term = $(2 \times 1)^2$ = 4
2nd term = $(2 \times 2)^2$ = 16
100th term = $(2 \times 100)^2$ = 40000

$n(n + 5)$ ←

e.g
1st term = 1 (1 + 5) = 6
2nd term = 2 (2 + 5) = 14
100th term = 100 (100 + 5) = 10500

You don't need to expand the expression

H Finding the algebraic rule

4n ← This is the 4 times table

4, 8, 12, 16, 20...

7, 11, 15, 19, 22

This has the same constant difference – but is 3 more than the original sequence

4n + 3

This is the constant difference between the terms in the sequence

This is the comparison (difference) between the original and new sequence

Maths: 8.09 Indices…..

Key words	
Base	The number that gets multiplied by a power
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 a variable
Simplify	To reduce a power to its lowest term
Product	Multiply

Sparx codes for this topic	
M949	Addition/Subtraction with Indices
M608, M120	Addition/Subtraction laws for indices
M120, U235	Multiply expressions with indices
M120, U235	Divide expressions with indices

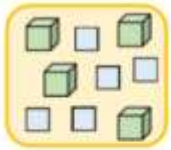
Addition/ Subtraction with indices

Coefficient — Power

$5x^2 + 4x^4$

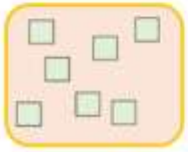
Term Term

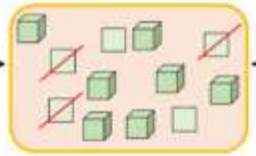
Expression



Each square represents x^2 and each cube represents x^4

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

$5x^2 + 2x^2 \rightarrow$  $\rightarrow 7x^2$

$5x^2 + 6x^4 - 3x^2 + x^4 \rightarrow$  $\rightarrow 2x^2 + 7x^4$

Divide expressions with indices

$$\frac{24}{36} \rightarrow \frac{2 \times 2 \times 2 \times 3}{2 \times 3 \times 2 \times 3} \rightarrow \frac{2}{3}$$

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

Cross cancelling factors shows cancels the expression

$\frac{23a^7y^2}{5db^6}$ This expression cannot be divided (cancelled down) because there are no common factors or similar terms

Addition/ Subtraction laws for indices

$3^5 \times 3^2 = (3 \times 3 \times 3 \times 3 \times 3) \times (3 \times 3) \rightarrow 3^7$

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

$3^5 \div 3^2 \rightarrow 3^3$

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

Addition law for indices

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

Subtraction law for indices

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

Multiply expressions with indices

$4b \times 3a$
$\equiv 4 \times b \times 3 \times a$
$\equiv 4 \times 3 \times b \times a$
$\equiv 12ab$

$5t \times 9t$
$\equiv 5 \times t \times 9 \times t$
$\equiv 5 \times 9 \times t \times t$
$\equiv 45t^2$

$2b^4 \times 3b^2$
$\equiv 2 \times b \times b \times b \times b \times 3 \times b \times b$
$\equiv 2 \times 3 \times b \times b \times b \times b \times b \times b$
$\equiv 6b^6$

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

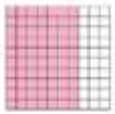
Maths: 8.10 Fractions & percentages…..

Key words	
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)

Sparx codes for this topic	
M264, M958	Convert FDP
M695, M437	Fraction/Percentage of amount
M695, M437	Convert FDP < and > 100
M533	Percentage increase
M533	Percentage decrease
M958	Express as a % - Non calculator
M235	Express as a % - Calculator
M533	Percentage change

Convert FDP

R

$\frac{70}{100}$ → This also means 70 ÷ 100 → 70 out of 100 squares → 70 "hundredths" = 7 "tenths" = 0.7 →  → 70 hundredths = 70%

Using a calculator

 → S⇔D → Convert to a decimal

This will give you the answer in the simplest form

× 100 converts to a percentage

Be careful of recurring decimals

e.g. $\frac{1}{3}$ = 0.3333333

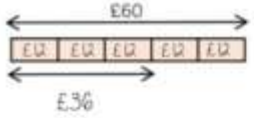
$0.\dot{3}$

The dot above the 3

Fraction/ Percentage of amount

R

Find $\frac{3}{5}$ of £60



Remember $\frac{3}{5}$ = 60%

10% of £60 = £6

50% of £60 = £30

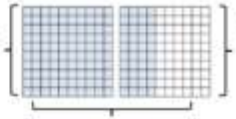
60% of £60 = £36

Remember $\frac{3}{5}$ = 60% = 0.6

60% of £60 = 0.6 × 60 = £36

Convert FDP < and > 100%

100 hundredths
10 tenths
100%



40 hundredths
4 tenths
40%

140 hundredths
14 tenths
140%

100% + 40%
1 + 0.40
= 1.40

Express as a % - Non-calculator

Percent – per hundred

7 per every 10 are orange → $\frac{7}{10}$ → This means that 70 per every 100 are orange → $\frac{70}{100}$ → 70%

27 per every 50 shaded → $\frac{27}{50}$ → 54 per every 100 shaded → $\frac{54}{100}$ → 54%

Denominator 100

Equivalent fractions

Express as a % - Calculator

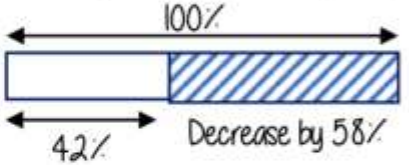
$\frac{13}{30}$ →  → $\frac{13}{30}$ → × 100 → 43.3333...% = 43%

This the same as 13 ÷ 30

Can't use equivalence easily to find 'per hundred'

Decimal percentages are still a percentage

Percentage decrease: Multipliers

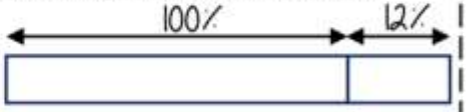


100% − 58% = 42%

100 − 058 = 042

Multiplier Less than 1

Percentage increase: Multipliers



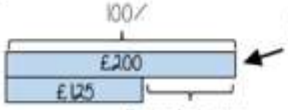
100% + 12% = 112%

100 + 0.12 = 1.12

Multiplier More than 1

Percentage change

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

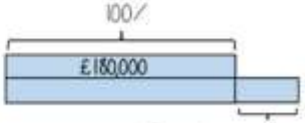


All values of change compare to the ORIGINAL value

Percentage loss: $\frac{75}{200}$ × 100 = 37.5%

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

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



Percentage profit

Money made (profit value) → $\frac{36000}{180000}$ × 100 = 20%

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?

Maths: 8.11 Standard index form.....

Key words	
Standard (index) Form	a system of writing very big or very small numbers
Commutative	an operation is commutative if changing the order does not change the result
Base	The number that gets multiplied by a power
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
Negative	a value below zero

Sparx codes for this topic	
M113	Positive powers of 10
M719	Standard form with numbers > 1
M678	Numbers between 0 and 1
M678	Negative powers of 10
U290	Mental calculations
U290	Addition and subtraction
U264	Multiplication and division
U161	Using a calculator

Positive powers of 10

1 billion – 1 000 000 000

$10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10 = 10^9$

Addition rule for indices: $10^a \times 10^b = 10^{a+b}$

Subtraction rule for indices: $10^a \div 10^b = 10^{a-b}$

Numbers between 0 and 1

0.054

$= 5.4 \times 10^{-2}$

1	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$
10^0	10^{-1}	10^{-2}	10^{-3}
0	0	5	4

A negative power does not mean a negative answer – it means a number closer to 0

Standard form with numbers > 1

Any number between 1 and less than 10 → $A \times 10^n$ ← Any integer

Example

3.2×10^4

$= 3.2 \times 10 \times 10 \times 10 \times 10$

$= 32000$

Non-example

0.8×10^4

5.3×10^{07}

Negative powers of 10

0.001

$1 \times \frac{1}{1000}$

1×10^{-3}

10	1	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$
10^1	10^0	10^{-1}	10^{-2}	10^{-3}
0	0	0	0	1

Any value to the power 0 always = 1

Negative powers do not indicate negative solutions

Mental calculations

$6.4 \times 10^2 \times 1000$ Not in Standard Form

$= 6.4 \times 10^2 \times 10^3$ Use addition for indices rule

$= 6.4 \times 10^5$

$(2 \times 10^3) \div 4$ Divide the values

$= (2 \div 4) \times 10^3$

$= 0.5 \times 10^3$

$(8 \times 10^5) \times (3)$

$= 24 \times 10^5$ Not in Standard Form

$= 2.4 \times 10^1 \times 10^5$ Use addition for indices rule

$= 2.4 \times 10^6$

Remember the layout for standard form

Any number between 1 and less than 10 → $A \times 10^n$ ← Any integer

Addition and Subtraction

Tip: Convert into ordinary numbers first and back to standard from at the end

$6 \times 10^5 + 8 \times 10^5$

Method 1

$= 600000 + 800000$

$= 1400000$

$= 1.4 \times 10^6$

More robust method
Less room for misconceptions
Easier to do calculations with negative indices
Can use for different powers

Method 2

$= (6 + 8) \times 10^5$

$= 14 \times 10^5$

This is not the final answer

$= 1.4 \times 10^1 \times 10^5$

$= 1.4 \times 10^6$

Only works if the powers are the same

Order numbers in standard form

6.4×10^{-2} 0.064

2.4×10^2 240

3.3×10^0 1

1.3×10^{-1} 0.13

Look at the power first, will the number be > or < than 1

Use a place value grid to compare the numbers for ordering

10^2	10^1	10^0	10^{-1}	10^{-2}	10^{-3}	10^{-4}

Multiplication and division

$\frac{1.5 \times 10^5}{0.3 \times 10^3}$ ← Division questions can look like this

$(1.5 \times 10^5) \div (0.3 \times 10^3)$

$1.5 \div 0.3 \times 10^5 \div 10^3$

$= 5 \times 10^2$

For multiplication and division you can look at the values for A and the powers of 10 as two separate calculations

Revisit addition and subtraction laws for indices – they are needed for the calculations

Addition law for indices: $a^m \times a^n = a^{m+n}$

Subtraction law for indices: $a^m \div a^n = a^{m-n}$

Using a calculator

$1.4 \times 10^5 \times 3.9 \times 10^3$

Use a calculator to work out this question to a suitable degree of accuracy

Input 1.4 and press [×10^x] Then press 5 (for the power)

Press [×]

Input 3.9 and press [×10^x] Then press 3 (for the power)

Press [=]

This gives you the solution

Click calculator for video tutorial

To put into standard form and a suitable degree of accuracy

Press [SHIFT] [SETUP] and then press 7 for sci mode

Choose a degree of accuracy so in most cases press 2

Answer: 5.5×10^5

Maths: 8.12 Number sense…..

Key words	
Significant	Place value of importance
Round	Making a number simpler but keeping its value close to what it was. 1 Decimal: Place holders after the decimal point
Overestimate	Rounding up — gives a solution higher than the actual value
Underestimate	Rounding down — gives a solution lower than the actual value
Metric	a system of measurement
Balance	The amount of money in a bank account
Deposit	Putting money into a bank account

Sparx codes for this topic	
M111, M994, M131	Round to powers of 10 and 1 sig figure
M431	Round to decimal places
U225	Estimate calculations
M521	Order of operations
M901	Calculations with money
M772, M530, M761, M728, M465, M774	Units are important
M515, M627, M963, M747	Time and the calendar

Round to powers of 10 and 1 sig figure

R If the number is halfway between we "round up"

5495 to the nearest 1000

5000 ⬆ 6000

5475 to the nearest 100

5400 ⬆ 5500

5475 to the nearest 10

5470 ⬆ 5480

370 to 1 significant figure is 400
37 to 1 significant figure is 40
3.7 to 1 significant figure is 4
0.37 to 1 significant figure is 0.4
0.00037 to 1 significant figure is 0.0004

Round to the first non-zero number

Order of operations

R

Brackets Operations in brackets are calculated first

Other operations e.g. powers, roots,

Multiplication/ Division

They are carried out in the order from left to right in the question

Addition/ Subtraction

They are carried out in the order from left to right in the question

Round to decimal places

2.46192 ← Focus on the numbers **after** the decimal point

"To 1dp" – to one number after the decimal
"To 2dp" – to two numbers after the decimal

2.46192 (to 1dp) - Is this closer to 2.4 or 2.5

24 ⬆ 25

2.4 6192 This shows the number is closer to 2.5

2.46192 (to 2dp) - Is this closer to 2.46 or 2.47

246 ⬆ 247

2.46 192 This shows the number is closer to 2.46

Estimate the calculation

Round to 1 significant figure to estimate

$4.2 + 6.7 \approx 4 + 7 \approx 11$ This is an **overestimate** because the 6.7 was rounded up more

The equal sign changes to show it is an estimation

$21.4 \times 3.1 \approx 20 \times 3 \approx 60$ This is an **underestimate** because both values were rounded down

It is good to check all calculations with an estimate in all aspects of maths – it helps you identify calculation errors

Metric measures of length

Kilo - 1000 x meter Centi - $\frac{1}{100}$ x meter

Milli - $\frac{1}{1000}$ x meter

Units are important: Useful Conversions

mm ⇄ cm (÷ 10 / × 10) ⇄ m (÷ 100 / × 100) ⇄ km (÷ 1000 / × 1000)

g ⇄ kg (÷ 1000 / × 1000)

ml ⇄ L (÷ 1000 / × 1000)

Units of weight/ capacity

Weight - g, kg, t
Capacity (volume of liquid) - ml, L

Calculations with money

Debit - You have £0 or more in an account

Credit - You have less than £0 in an account

Using a calculator – ensure you are working in the correct units:
£1.30 + 50p = 130 + 50 (in pence)
= 1.30 + 0.50 (in pounds)

Money calculations are to 2dp

£1 = 100p

Time and the calendar

1 Year – the amount of time it takes Earth to go around the sun 365 (and a quarter) **days**
Leap Year – 366 **days** (every 4 years)

12 Months = one year = 52 weeks
31 days – Jan, March, May, July, Aug, Oct, Dec
30 days – April, June, Sept, Nov
28 days – Feb (29 leap year)

1 week – 7 days
Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday

1 day – 24 hours
1 hour - 60 minutes
1 minute – 60 seconds

Use a number line for time calculations!

Analogue Clock

12-hour clock
- Use am (morning) and pm (afternoon)
- Only use hour times up to 12

Digital Clock (24-hour times)

24-hour clock
- 0-11 (morning hours)
- 12-23 (afternoon hours)

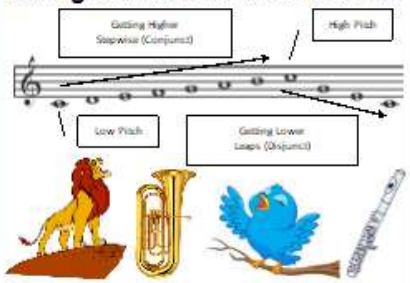
Music

Building Bricks

Exploring the Elements of Music MAD T SHIRT

Melody - Pitch

The **highness** or **lowness** of a sound.



Articulation

How individual notes or sounds are **played/techniques.**

LEGATO – playing notes in a long, smooth way shown by a **SLUR**.

STACCATO – playing notes in a short, detached, spiky way shown by a **DOT**.

Dynamics

The **volume** of a sound or piece of music.

VERY LOUD: *Fortissimo (ff)*
LOUD: *Forte (f)*
QUITE LOUD: *Mezzo Forte (mf)*
QUITE SOFT: *Mezzo Piano (mp)*
SOFT: *Piano (p)*
VERY SOFT: *Pianissimo (pp)*

GETTING LOUDER: *Crescendo (cre*
GETTING SOFTER: *Diminuendo (dim.)*

Texture

How much sound we hear.

THIN TEXTURE: *(sparse/solo)* – small amount of instruments or melodies.

THICK TEXTURE: *(dense/layered)* – lots of instruments or melodies.

Structure

Mow the music is put together in sections and how often they are repeated

Harmony and Tonality

Harmony refers to the sound that is made when more than one pitch is sounded at the same time, often these are **chords**

Tonality is the key or scale used for a piece of music that gives it colour or character usually **Major or Minor**

Instruments (Timbre/Sonority)

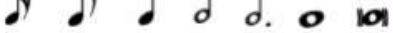
Describes the **unique sound or tone quality** of different instruments voices or sounds.

Velvety, Screechy, Throaty, Rattling, Mellow, Chirpy, Brassy, Sharp, Heavy, Buzzing, Crisp, Metallic, Wooden etc.

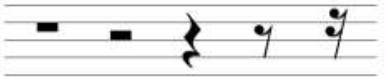
Rhythm (Duration)

The **length** of a sound.

SHORT ⟶ **LONG**



The opposite or absence of sound, **no sound**. In music these are **RESTS.**



Tempo (speed)

The **speed** of a sound or piece of music.

FAST: *Allegro, Vivace, Presto* **SLOW:** *Andante, Adagio, Lento*

GETTING FASTER – *Accelerando (accel.)*

GETTING SLOWER – *Ritardando (rit.) or Rallentando (rall.)*

Music can create an **atmosphere**

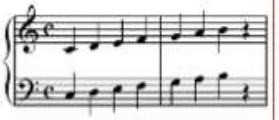
Music can create an **image** *e.g., in response to art or, a story*– this is called **PROGRAMME MUSIC**.

Music can be **calming**

Music can be used for **spiritual reasons**

Notation

How music is **written** down.



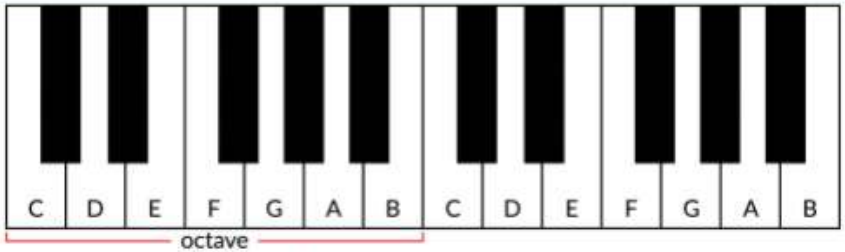
STAFF NOTATION – music written on a **STAVE** (5 lines and spaces)

GRAPHIC NOTATION/SCORE – music written down using shapes and symbols to represent sounds.

Keyboard Skills

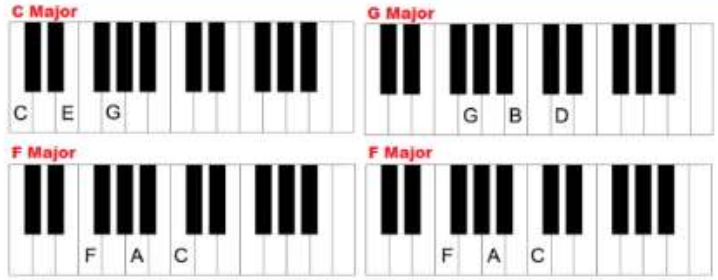
Exploring Treble Clef Reading and Notation

A. Layout of a Keyboard/Piano



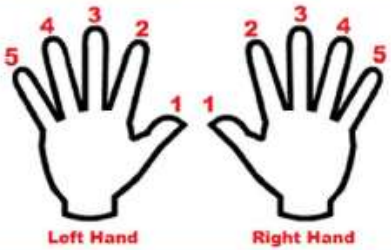
A piano or keyboard is laid out with **WHITE KEYS** and Black Keys (see section G). C is to the left of the two Black Keys and the notes continue to G then they go back to A again. Notes with the same letter name/pitch are said to be an **OCTAVE** apart. **MIDDLE C** is normally in the centre of a piano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

C. Keyboard Chords



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

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

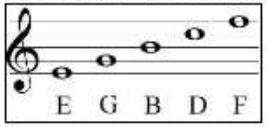


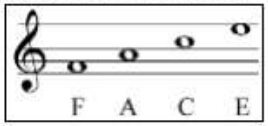
B. Treble Clef & Treble Clef Notation

A **STAVE** or **STAFF** is the name given to the five lines where musical notes are written.

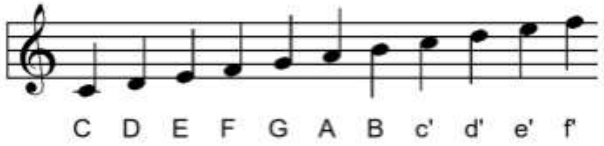
The position of notes on the stave or staff shows their **PITCH** (how high or low a note is). The **TREBLE CLEF** is a symbol used to show high-pitched notes on the stave and is *usually* used for the right hand on a piano or keyboard to play the **MELODY** and also used by high pitched instruments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

Every Green **Bogie Deserves Flicking**. Notes in the **SPACES** spell **"FACE"**



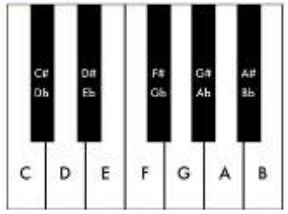


Notes from **MIDDLE C** going up in pitch (all of the white notes) are called a **SCALE.**



E. 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 D*b* – there's just two different ways of looking at it! Remember, black notes or keys that are to the **R**IGHT of a white note are called SHA**R**PS and black notes to the **L**EFT of a white note are called FL**A**TS.



THE HECTIC TEACHER
RESOURCE

SLEEP

Personal Development

Define: *Sleep Disorders*

These are medical conditions which affect our sleep. They can only be diagnosed by a Doctor and can require medicinal intervention.

Define: *REM Sleep*

A kind of sleep that occurs at intervals during the night and is characterized by rapid eye movements, more dreaming and bodily movement, and faster pulse and breathing.

Define: *Sleep Apnoea*

Sleep apnea occurs when the upper airway becomes completely or partially blocked, interrupting regular breathing for short periods of time – which then wakes you up.

Define: *Insomnia*

Trouble falling asleep or may wake up frequently during the night or early in the morning. Acute insomnia is when this occurs infrequently. Chronic is when it occurs regularly.

Define: *Sleep Deprivation*

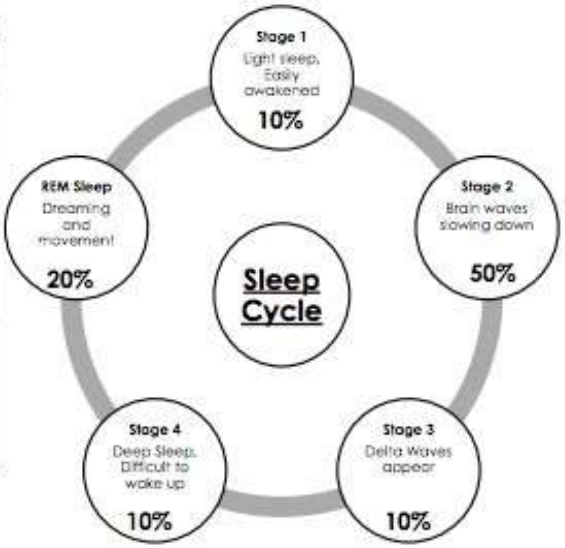
Sleep deprivation means you're not getting enough sleep. This can be caused intentionally or not. It can be either chronic or acute and may vary widely in severity.

How Much Sleep Is "Enough"?

Sleep is one of the cornerstones of health. Sleeping too much or too little can have adverse effects on your health. Sleeping less than 5 hours per night can double your risk of heart disease, heart attack, and stroke. There is also a persistent relationship between lack of sleep and weight gain, insulin resistance, and diabetes.

AGE GROUP	RECOMMENDED NUMBER OF HOURS OF SLEEP
Newborns (0-3 months)	14-17 hours
Infants (4-11 months)	12-15 hours
Toddlers (1-2 years)	11-14 hours
Preschoolers (3-5)	10-13 hours
School-age children (6-13)	9-11 hours
Teenagers (14-17)	8-10 hours
Young adults (18-25)	7-9 hours
Adults (26-64)	7-9 hours
Seniors (65 and older)	7-8 hours

Mercola.com



What can cause problems with our sleep?

Medical Issues – the are 89 recognised sleep disorders and the most common are Insomnia, Sleep apnoea, Restless limb syndrome.

Technology - The blue light emitted by **screens** restrain the production of melatonin, the hormone that controls your **sleep**/wake cycle or circadian rhythm. Reducing melatonin makes it harder to fall and stay asleep.

Hunger – It is not recommended to eat a big meal before bedtime, a small bedtime snack helpful. If you go to bed hungry, you're likely to wake up with hunger pangs.

Stress causes hyperarousal, which can upset the balance between sleep and wakefulness.

Mental Health Issues – Mental health issues can have a variety of impacts on sleep, such as anxiety making it hard to settle due to racing thoughts, PTSD can lead to nightmares and night terrors, depression can lead to over sleeping.

Your Bed - Past research shows that sleeping on an uncomfortable mattress can rob you of up to an hour's vital, restful sleep.

Clutter and Messy Rooms - A cluttered bedroom makes for a cluttered mind. Don't use it as a dumping ground for the rest of the house. Your bedroom should be a sanctuary, somewhere you can go to turn off and relax.

Napping and Lie Ins: Trying to make up for lack of sleep with extra time in bed the following morning, or even a few days later, throws off your internal body clock. Naps of under 30 minutes can be refreshing any longer throws out your body clock

Consequences of Sleep Deprivation

- Emotional Affects
  - Irritability
  - Mood Swings
  - Fatigue / Tiredness
  - Lack of Motivation
  - Depression
- Physical Affects
  - High Blood Pressure
  - Reduced Sex Drive
  - Lower Immune system
  - Disrupt hormone regulation
  - Higher risk of type 2 diabetes
- Cognitive effects
  - Forgetfulness
  - Clumsiness
  - Difficulty focusing

Top Tips for a Good nights sleep

1. Routines – set a routine which your body can recognize is a wind down for sleep.
2. Tech free bedrooms – stop using technology such as tablets and phones 2 hours before bed or use a blue light filter.
3. Clutter free bedrooms – Keeping your bedroom clutter free and tidy and help make the room feel calmer and more relaxing.
4. Reduce stimulant food intake – foods and drinks which contain a lot of sugar and caffeine can impact your sleep so try not to consume too much after 3pm.
5. Temperature - the suggested bedroom **temperature** should be around 18 degrees Celsius .

More Information & Support

Sleep deprivation means you're not getting enough sleep. This can be caused intentionally or not. It can be either chronic or acute and may vary widely in severity.

THE HECTIC TEACHER
RESOURCE

DRUGS: EFFECTS AND WITHDRAWAL

Personal Development

Define: *Stimulant*

A drug which cause a person to feel like they have more energy or more awake.

Define: *Depressant*

A drug which cause a person to feel calmer or lethargic.

Define: *Hallucinogen*

A drug which cause a person to experience sensations that are not really there. This could be visual, auditory or physical.

Define: *Analgesic*

A drug which reduces the feeling of pain.

Define: *Withdrawal*

a predictable group of signs and symptoms that result from either the sudden removal of, or abrupt decrease in the regular dosage of a drug.

Define: *Addiction*

The feeling of needing a drug in order to get through the day.

Drug	Analgesic	Hallucinogen	Stimulant	Depressant
Caffeine			✓	
Cocaine			✓	✓
Heroin	✓			✓
Cannabis		✓		✓
Crack Cocaine			✓	
Amphetamines		✓	✓	
Ecstasy			✓	
Alcohol				✓
Inhalants		✓	✓	
Tobacco				✓
LSD		✓		
Magic Mushrooms		✓		
Steroids	✓			

Mental and Emotional Withdrawal Symptoms

- **Anxiety:** Anxiety, panic attacks, restlessness, irritability
- **Depression:** Social isolation, lack of enjoyment, fatigue, poor appetite
- **Sleep:** Insomnia, difficulty falling asleep or staying asleep
- **Cognitive:** Poor concentration, poor memory

Physical Withdrawal Symptoms

- **Head:** Headaches, dizziness
- **Chest:** Chest tightness, difficulty breathing
- **Heart:** Racing heart, skipped beats, palpitations
- **GI:** Nausea, vomiting, diarrhoea, stomach aches
- **Muscles:** Muscle tension, twitches, tremors, shakes, muscle aches
- **Skin:** Sweating, tingling

Dangerous Withdrawal Symptoms

- Grand mal seizures
- Heart attacks
- Strokes
- Hallucinations
- Delirium tremens (DTs)

Who Can you turn to for help and Support

Parents and Family members	School Staff and Safeguarding Team
Your GP or Practice Nurse	
NSPCC	Helpline: 0808 800 5000 nspcc.org.uk
Childline	Helpline: 0800 1111(https://www.childline.org.uk
NHS Live Well Website	www.NHS.UK/Livewell
The Mix	Helpline: 0808 808 4994
Talk to Frank	Helpline: 0300 123 6600 talktofrank.com
Action on Addiction	Helpline: 0300 330 0659 actiononaddiction.org.uk
DrugFAM	Helpline: 0300 888 3853 drugfam.co.uk

THE HECTIC TEACHER
RESOURCE

TYPES OF DRUGS

Personal Development

Caffeine	Cocaine	Heroin	Cannabis	Crack Cocaine	Amphetamines	Ecstasy
Caffeine is a naturally occurring chemical stimulant called trimethylxanthine. In its pure **form**, **caffeine** is a white crystalline powder that tastes very bitter. **Caffeine** is in tea, coffee, chocolate, many soft drinks, and pain relievers and other over-the-counter medications.	The **hydrochloride** salt is usually in a powdered form by the time it makes it to street dealers and users. The texture is similar to baby powder. In fact, it is so similar that many dealers will cut their coke with baby powder in order to increase their profits. The color can range from a clear white to an off-white, and sometimes even a yellowish color.	In its purest form, heroin is a fine white powder. But more often, it is found to be rose gray, brown or black in color. The coloring comes from additives which have been used to dilute it, which can include sugar, caffeine or other substances. Street heroin is sometimes "cut" with strychnine1 or other poisons.	Soft black resin, furry green leaves dried to look like herbs or hard brown lumps, cannabis can look very different depending on its type – but it all comes from cannabis plants.	**Crack cocaine** is a purer form of cocaine and looks somewhat like rocks. Most of the time, crack cocaine is off-white in color, but it can have a rosy hue that makes it appear pink.	It's usually an off-white or pinkish powder and can sometimes look like crystals. It's also available in a paste form which is usually white/grey or brown in colour, and can be damp and gritty.	Ecstasy comes in pill or powder form. Ecstasy pills can be white, coloured, round, square or pressed into any shape. Some pills have designs stamped into them, like well known company logos that the pills are then named after. Ecstasy powder looks like white/grey crystals and is called MDMA, mandy or MD.

Alcohol	Inhalants	Tobacco	LSD	Magic Mushrooms	Steroids
While some drinks have more alcohol than others, the type of alcohol in all alcoholic drinks is the same – it's a type of alcohol called ethanol. Alcohol is a colourless, odourless and inflammable fluid.	The term inhalants refers to the various substances that people typically take only by inhaling. These substances include solvents (liquids that become gas at room temperature), aerosol sprays; gases; nitrites (prescription medicines for chest pain)	Tobacco is a plant grown for its leaves, which are dried and fermented before being put in tobacco products. People can smoke, chew, or sniff tobacco. Smoked tobacco products include cigarettes, cigars, bidis, and kreteks. Some people also smoke loose tobacco in a pipe or hookah (water pipe). Chewed tobacco products include chewing tobacco, snuff, dip, and snus; snuff can also be sniffed.	It is produced in crystal form laboratories, mainly in the United States. These crystals are converted to a liquid for distribution. It is odorless, colorless, and has a slightly bitter taste. LSD is sold on the street in small tablets ("microdots"), capsules or gelatin squares ("window panes"). It is sometimes added to absorbent paper, which is then divided into small squares decorated with designs or cartoon characters ("loony toons"). Occasionally it is sold in liquid form.	Magic mushrooms are often sold raw or dried. In the UK, the most common types are liberty caps (*Psilocybe semilanceata*) and fly agaric (*Amanita muscaria*). Liberty caps look like small tan-coloured mushrooms. Fly agarics look like red and white spotted toadstools	Anabolic steroids come in the form of tablets, capsules, a solution for injection and a cream or gel to rub into the skin. Weightlifters and bodybuilders who use steroids often take doses that are up to 100 times greater than those used to treat medical conditions.

Define: ***Drug***
Drugs are chemicals that alter, block, or mimic chemical reactions in the brain. This causes alterations of the body's normal process's causing physical or mental changes.

Define: ***Medicine***
A drug or other preparation for the treatment or prevention of disease.

THE HECTIC TEACHER
RESOURCE

SMOKING AND VAPING

Personal Development

Define: *Nicotine*

A toxic colourless or yellowish oily liquid which is the chief active constituent of tobacco. It acts as a stimulant in small doses, but in larger amounts blocks the action of autonomic nerve and skeletal muscle cells.

Define: *Vaping*

The action or practice of inhaling and exhaling the vapour produced by an electronic cigarette or similar device.

Define: *Smoking*

The action or habit of inhaling and exhaling the smoke of tobacco or a drug. Usually through Cigarettes or Cigars.

Define: *E-Cigarette*

E-cigarettes are electronic devices that heat a liquid and produce an aerosol or mix of small particles in the air. Which is then inhaled.

Effects Of Nicotine

Nicotine is both a sedative and a stimulant.

When a body is exposed to nicotine, the individual experiences a "kick." This is partly caused by nicotine stimulating the adrenal glands, which results in the release of adrenaline.
This surge of adrenaline stimulates the body. There is an immediate release of glucose, as well as an increase in heart rate, breathing activity, and blood pressure. Indirectly, nicotine causes the release of dopamine in the pleasure and motivation areas of the brain.

How do E-Cigarettes Work

E-cigarettes produce an aerosol by heating a liquid that usually contains nicotine, flavorings, and other chemicals that help to make the aerosol.

The liquid used in e-cigarettes often contains nicotine and flavorings. This liquid is sometimes called "e-juice," "e-liquid," "vape juice," or "vape liquid."

Users inhale e-cigarette aerosol into their lungs. Bystanders can also breathe in this aerosol when the user exhales it into the air. E-cigarette aerosol is NOT harmless "water vapor." The e-cigarette aerosol that users breathe from the device and exhale can contain harmful and potentially harmful substances, including:

- Nicotine
- Ultrafine particles that can be inhaled deep into the lungs
- Flavoring such as diacetyl, a chemical linked to a serious lung disease
- Volatile organic compounds
- Cancer-causing chemicals
- Heavy metals such as nickel, tin, and lead

It is difficult for consumers to know what e-cigarette products contain. For example, some e-cigarettes marketed as containing zero percent nicotine have been found to contain nicotine.

Smoking and the Law

- You must be over 18 to buy cigarettes in the UK. If you're under 16 the police have the right to confiscate your cigarettes.

It's illegal:

- For shops to sell you cigarettes if you are underage
- For an adult to buy you cigarettes if you are under 18
- To smoke in all public enclosed or substantially enclosed area and workplaces.
- To smoke in a car with a child.

Vaping and the Law

- You must be 18 or over to purchase e-cigarettes or e-liquids in the UK. It also became illegal for an adult to buy e-cigarettes for someone under the age of 18.
- Although there is no legal restriction on where you can vape in the UK there are local laws and bylaws in force that prohibit the practice. The choice of whether or not to allow vaping is that of the property owner.
- Vaping generally is not allowed on the underground, planes, buses or trains and train stations in the United Kingdom.
- Vaping while you drive may not seem like such a big deal but it could land you with up to nine penalty points and a fine of £2,500.

Who Can you turn to for help and Support

Parents or trusted family members	School Safe Guarding Team or any member of staff.
Your GP or Practice Nurse.	
Smoke Free Future	https://smokefreefuture.co.uk
NHS – Stop Smoking	https://www.nhs.uk/live-well/quit-smoking
Smoke Free	https://smokefree.gov/

THE HECTIC TEACHER
RESOURCE

PHYSICAL PUBERTY

Personal Development

Define: *Puberty*

The process of physical maturity in a person that takes place in adolescence

Define: *Menstruation*

Also known as a period. The process in a woman of discharging blood and other material from the lining of the uterus at intervals of about one lunar month from puberty until the menopause, except during pregnancy.

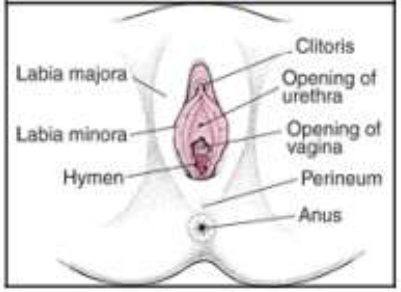
Define: *Hormones*

A chemical substance produced in the body that controls and regulates the activity of certain cells or organs.

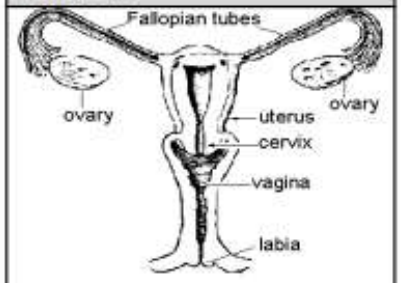
Define: *Wet Dream*

An involuntary ejaculation that occurs whilst a person is asleep.

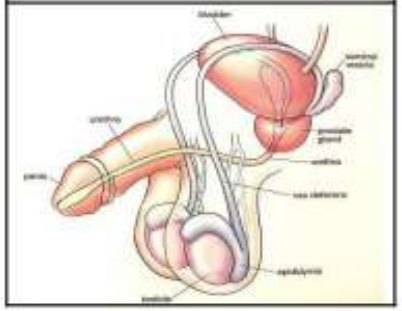
Female Genitalia – External (Vulva)



Female Genitalia – Internal



Male Genitalia



Physical Changes during Puberty

Boys only	• Starts between 10 and 12 years of age • Facial Hair • Voice Breaking • Erections • Wet Dreams • Widening of chest and Shoulders
Girls Only	• Starts between 9 and 11 years of age. • Menstruation / Periods begin • Breast growth • Stretch Marks • Cellulite • Hips widen
Both	• Grow taller • Sweat more • Changes to hair and skin • Spots and Pimples

Things to Remember

- Puberty begins at different times for different people.
- Changes will happen at different rates and in a different order for different people,
- Everyone goes through puberty, you are not alone.
- Good diet and exercise can help deal with some of the physical changes.
- Puberty is normal despite feeling very abnormal.

Who Can you turn to for help and Support

Parents or trusted family members	Teachers or school Staff
Your Doctor or Practice Nurse	School Nurse
NSPCC	Helpline: 0808 800 5000 (24 hours, every day) nspcc.org.uk
Childline	Helpline: 0800 1111(24 hours, every day) https://www.childline.org.uk
NHS Live Well Website	www.NHS.UK/Livewell

WADHAM KS3 PE KNOWLEDGE ORGANISER: Gymnastics

Physical Education

Skill

Rolls:

Forward roll, Backwards roll, Log roll, Teddy bear roll & circle roll

Jump:

Tuck, star, straddle & pike.

Travel:

Twisting and turning, rotation, cartwheel, leap, slide, hop & skip

Balances:

Tuck, straddle, pike, dish, arch, star, v-sit, shoulder stand, front support, back support, pair/group balances & arabesque.

Sequence:

Three or more skills which are performed together creating a different combination skill

Technique

Starting and finishing position – clearly shows when the gymnast is starting and finishing a routine

Pointed toes – pointing your toes will make your gymnastics aesthetically pleasing and encourages whole body tension

Extension – making the limbs long. Pointing toes, fingers, keeping your head up.

Aesthetically pleasing – means it looks good or pleasing to the eye

Equipment

Gymnastics mat

Trampette

Spring board

Vaulting box

Landing (crash) mat

Health and Safety

- Shoes and socks need to be **off** during a gymnastics lessons to prevent you slipping and injuring yourself
- When carrying equipment, shoes and socks need to be **on** in case any equipment is

Key Words:

Aesthetically pleasing

Precision

Centre of gravity

Fluency

Canon

Unison

Mirror

Matching

Key Words:

Levels

Rolls

Travels

Balances

Routine

Sequence

Tension

Extension

WADHAM KS3 PE KNOWLEDGE ORGANISER: Health Related Fitness (HRF)

Physical Education

Components of Fitness

Agility the ability to change the direction of the body at speed, whilst maintaining control

Balance the ability to stay upright or stay in control of the body movement

Cardiovascular Endurance (Stamina) The ability to continue exercising whilst getting energy for muscular movement from the aerobic energy system

Coordination The ability to use two or more body parts together to complete a skill under control, smoothly and efficiently

Flexibility The range of movement at a joint

Muscular endurance the ability to repeatedly use your muscle and body without tiring

Power A type of fitness. The ability to exert maximal force in as shortest time possible

Reaction Time The ability to respond quickly to a stimulus

Speed The ability move part or the whole body quickly

Strength The maximum force a muscle or group of muscles can exert against a resistance

Fitness Tests

- Sit and Reach Test
- Sit Up Test
- Press up
- Multistage Fitness Test (Bleep test)
- Wall Toss Test
- Illinois Agility Test
- 30 Meter Sprint test
- Rule Drop Test
- Standing Stalk Test
- The Cooper Run
- Hand Grip Test

Key Words

Health A complete state of physical, mental and social wellbeing.

Fitness The ability to meet the demands of the environment you are in.

Heart Rate How many times your heart beats in a minute.

Pulse A place on your body where you can feel/measure your heart rate.

Aerobic Exercise When oxygen is used to make energy, usually at moderate intensity at a continuous rate.

Anaerobic exercise Without oxygen'. High intensity exercise for short periods of time where oxygen is not predominantly used to produce energy

Energy Balance When the energy consumed equals the energy used and body weight stays the same

Calories- a measure of the energy found in food

Heart pumps blood carrying oxygen around your body

Oxygen is taken from the air we breathe in and used to make energy for exercise.

Carbon Dioxide Is a waste product of energy production which we breathe out

Lactic Acid A waste product of energy production which causes pain when it builds up in out muscles.

Science

8Aa – Food and advertising

Word	Pronunciation	Meaning
claim		A statement that is supposed to be true.

8Aa – Nutrients

Word	Pronunciation	Meaning
carbohydrate	*car-bO-**high**-drate*	A nutrient that is used as the main source of energy.
constipation	*con-stip-**ay**-shun*	When the intestines get blocked.
diet		The food that you eat.
fat		A nutrient that is stored to be used for energy in the future. It also acts as a thermal insulator.
fibre	***fY**-ber*	A substance found in food that is not used up by the body. It helps to keep our intestines clean.
lipid		Fats (and oils) are part of a large group of similar substances called lipids.
mineral (biology)		An element that is a nutrient needed in small quantities for health (e.g. calcium). Minerals are found in foods and soils as compounds called mineral salts.
mineral (chemistry)		A naturally occurring element or compound that can form distinct grains in rocks.
mineral salt (biology)		A compound containing an important element that is needed in small quantities for health (e.g. calcium). Plants get their mineral salts from the soil, animals get them from food.
nutrient	***new**-tree-ent*	A substance needed in the diet to provide raw materials for making new substances and for energy release.
nutrition	*new-**trish**-un*	The substances that help organisms respire and grow. All organisms need nutrition.
oil (biology)		A liquid fat.
protein	***prO**-teen*	A nutrient used for growth and repair.
raw material		A substance used to make other substances.
starch		A type of insoluble carbohydrate found in plants.
sugar		A type of soluble carbohydrate. Glucose is an example of a sugar.
vitamin		A nutrient needed in small quantities for health (e.g. vitamin C).

8Ab – Uses of nutrients

Word	Pronunciation	Meaning
fuel		A substance that contains a store of chemical or nuclear energy that can easily be transferred.
kilojoule (kJ)	***kill**-O-jool*	A unit for measuring energy. There are 1000 joules (J) in 1 kilojoule (kJ).
respiration	*res-per-**ay**-shun*	A process in which energy is released from substances so it can be used by an organism. All organisms respire.
transfer		When energy moves from one place to another.

Science

8Ac – Balanced diets

Word	Pronunciation	Meaning
anaemia	*an-**ee**-me-a*	A deficiency disease caused by a lack of iron. Causes tiredness and shortness of breath.
balanced diet		Eating a wide variety of foods to provide all the things the body needs.
deficiency disease	*def-**ish**-en-see*	A disease caused by a lack of a nutrient.
heart disease		A disease caused by narrowing of the arteries carrying blood to the muscles of the heart, so the heart muscles do not receive enough oxygen.
kwashiorkor	*kwash-ee-**or**-kor*	A deficiency disease caused by a lack of protein.
malnutrition	*mal-new-**trish**-un*	A problem caused by having too much or too little of a nutrient in the diet. Obesity, starvation and deficiency diseases are all examples.
night blindness		A deficiency disease caused by a lack of vitamin A. A person with the disease cannot see very well in dim light.
obesity	*ob-**ee**-sit-ee*	Being very overweight.
Reference Intake (RI)		The amount of a nutrient that people are advised to eat in a day.
rickets		A deficiency disease caused by a lack of calcium (or a lack of vitamin D). It causes weak and poorly shaped bones.
scurvy		A deficiency disease caused by a lack of vitamin C. Joints hurt, the gums bleed and cuts take a long time to heal.
starvation	*star-vay-shun*	A form of malnutrition in which people lack many nutrients.

8Ad – Digestion

Word	Pronunciation	Meaning
absorb		'To soak up' or 'to take in'.
anus	***ay**-nus*	The opening at the end of the gut.
bacterium	*bac-**teer**-ee-um*	A type of prokaryote microorganism. Plural is bacteria.
catalyst	***cat**-a-list*	A substance that speeds up a chemical reaction, without itself being used up.
digestion	*dye-**jes**-jun*	A process that breaks food into soluble substances in our bodies.
digestive juice	*dye-**jest**-iv*	A liquid containing enzymes that break down food.
digestive system	*dye-**jest**-iv*	An organ system that breaks down food.
egestion	*ee-**jes**-jun*	When faeces are pushed out of the anus.
elimination		Another term for 'egestion'.
enzyme		A substance that can speed up some processes in living things (e.g. breaking down food molecules).
faeces	***fee**-sees*	Waste food material produced by the intestines.
food pipe		A non-scientific term for the oesophagus.
gullet		Another term for 'oesophagus'.

Science

Word	Pronunciation	Meaning
gut		The organs that form the tube running from the mouth to the anus.
ingestion	*in-**jes**-jun*	Taking substances into the body. For example, we ingest food using our mouths.
insoluble	*in-**sol**-you-bul*	Describes a substance that cannot be dissolved in a certain liquid.
large intestine	*in-**test**-in*	An organ in which water is removed from undigested food.
liver		An organ used to make and destroy substances in your body. It also stores some substances.
microorganism		An organism too small to be seen with the naked eye.
oesophagus	*us-**off**-ag-us*	The muscular tube that leads from the mouth to the stomach. Also called the 'gullet'.
rectum		An organ that stores faeces before they are egested.
saliva	*sall-**eye**-va*	A digestive juice. It contains an enzyme that breaks down starch into sugar.
salivary gland	*sall-**eye**-vor-ee*	Found in the mouth. It makes saliva.
small intestine	*in-**test**-in*	An organ in which most digestion happens. The soluble substances produced by digestion are absorbed into the body here.
soluble	***sol**-you-bul*	Describes a substance that can dissolve in a certain liquid.
stomach	***stum**-uck*	An organ containing strong acid that mixes food up and digests proteins.

8Ae – Surface area

Word	Pronunciation	Meaning
surface area		The total area of all the surfaces of a three-dimensional object.

8Ae – Absorption

Word	Pronunciation	Meaning
absorb		'To soak up' or 'to take in'.
diffusion	*diff-**you**-zshun*	When particles spread and mix with each other without anything moving them.
microvillus		A fold on the surface of a villus cell. These folds increase the surface area so that digested food is absorbed more quickly. Plural is microvilli.
model		A way of showing or representing something that helps you to think about it or to find out about it.
plasma	***plaz**-ma*	The liquid part of the blood.
villus		A small finger-like part of the small intestine. These increase the surface area so that digested food is absorbed more quickly. Plural is villi.

Science

8Eb – Oxidation

Word	Pronunciation	Meaning
law of conservation of mass		The idea that mass is not lost or gained during a chemical reaction. The mass of all the reactants is equal to the mass of all the products.
metal		Any element that is shiny when polished, conducts heat and electricity well, is malleable and flexible and often has a high melting point.
metal oxide		A metal that has combined with oxygen in a chemical reaction, e.g. magnesium oxide. The general word equation for the reaction is: metal + oxygen → metal oxide
non-metal		Any element that is not shiny and does not conduct heat and electricity well.
oxidation	*ox-i-**day**-shun*	Reacting with oxygen. For example, when a fuel combusts or when a metal reacts with oxygen to form a metal oxide.
oxide		A compound of a metal or non-metal with oxygen, such as magnesium oxide or carbon dioxide.
oxidiser		A substance that supplies oxygen for a reaction.
phlogiston	*flo-**jist**-on*	A substance that scientists once thought explained why things burn; it has since been proved that it does not exist.

8Ec – Fire safety

Word	Pronunciation	Meaning
exothermic	*ex-O-**therm**-ic*	A reaction that gives out energy that can be felt as it heats the surroundings, such as combustion.
fire extinguisher		Something that is used to put out a fire, such as a canister of carbon dioxide, powder, water or foam.
fire triangle		A way of showing in a diagram that heat, fuel and oxygen are needed for fire.
hazard symbol		A warning symbol that shows why something is dangerous.

8Ec WS – Fair testing

Word	Pronunciation	Meaning
control variable	***vair**-ee-ab-el*	A variable other than the independent variable that could affect the dependent variable and so needs to be controlled.
dependent variable	*dee-**pend**-ent* ***vair**-ee-ab-el*	The variable that is measured in an investigation. The values of the dependent variable depend on those of the independent variable.
fair test		An experiment in which all the control variables are controlled and only changes in the independent variable cause changes in the dependent variable.
independent variable	***vair**-ee-ab-el*	The variable that you chose the values of in an investigation.
variable	***vair**-ee-ab-el*	Anything that can change and be measured.

Science

8Ed – Air pollution

Word	Pronunciation	Meaning
acid rain		Rainwater that is more acidic than usual due to air pollution, usually caused by sulfur dioxide and nitrogen oxides dissolved in it.
asthma		A condition in which the tiny tubes leading to the alveoli become narrow and start to fill with mucus.
catalytic converter	*cat-a-lit-ick*	A device fitted to the exhaust pipe of a vehicle to change harmful pollutant gases into less harmful gases.
complete combustion		When a substance reacts fully with oxygen, such as: carbon + oxygen → carbon dioxide
incomplete combustion		When a substance reacts only partially with oxygen, such as when carbon burns in air producing carbon dioxide, carbon monoxide and soot (unburnt carbon).
filter (chemistry)		Anything, such as cloth, paper or a layer of sand, through which a fluid is passed to remove suspended pieces of solid.
filter (physics)		Something that only lets certain colours through and absorbs the rest.
nitrogen oxide		Acidic gas formed when nitrogen reacts with oxygen at high temperatures, such as in a car engine. There are different types of nitrogen oxide.
pollutant		A substance that can harm the environment or the organisms that live there.
soot		A form of carbon, which is produced as very fine particles when hydrocarbon fuels undergo incomplete combustion.
sulfur dioxide		An acidic gas released from burning fossil fuels, which contributes to acid rain.

8Ee – Global warming

Word	Pronunciation	Meaning
climate change		Changes that will happen to the weather as a result of global warming.
global warming		Increased warming of the Earth's surface as a result of increased amounts of carbon dioxide and other greenhouse gases in the air.
greenhouse effect		The warming effect on the Earth's surface caused by greenhouse gases absorbing energy emitted from the warm Earth's surface and re-emitting it back to the surface.
greenhouse gas		A gas, such as carbon dioxide, water vapour or methane, in the Earth's atmosphere, which absorbs energy emitted from the Earth's surface and then emits it back to the surface.

8Ee Lit – Information and explanation text

Word	Pronunciation	Meaning
explanation		Text that describes how or why something happens.
information		Text that tells you who, what, where or when.

Science

8Ga – Building up/Metals and their properties

Word	Pronunciation	Meaning
catalyst	***cat**-a-list*	A substance that speeds up a reaction, without itself being used up.
chemical property	***kem**-ik-al*	How a substance reacts with other substances.
composite material	*kuh-m-**poz**-it*	A material made up of two or more substances. It has significantly different properties from the substances from which it is made.
halogen		An element in group 7 of the periodic table, such as fluorine and chlorine.
metal		Any element that is shiny when polished, conducts heat and electricity well, is malleable and flexible and often has a high melting point.
non-metal		Any element that is not shiny, and does not conduct heat and electricity well.
physical property	***fi**-zi-kal*	A description of how a material behaves and responds to forces and energy. Hardness is a physical property.

8Gb – Corrosion

Word	Pronunciation	Meaning
corrosion	*kur-**O**-zhuhn*	When something, such as stone or metal, reacts with chemicals in the air or water and gets worn away.
formula (chemical)		A combination of symbols and numbers that shows how many atoms of different kinds are in a particular molecule. In compounds that do not form molecules, it shows the ratio of elements in the compound.
rust		A weak, brown, crumbly solid formed when iron corrodes. (A mixture of oxides and hydroxides of iron including iron hydroxide.)
rusting		The corrosion of iron or steel (water and oxygen must be present for rusting to occur).
symbol equation	*eck-**way**-shun*	A way of writing out what happens in a chemical reaction using symbols to represent the substances involved.
word equation	*eck-**way**-shun*	An equation in which the names of the reactant(s) are written on the left side, there is an arrow pointing from left to right and the names of the product(s) are written on the right side.

8Gc – Metals and water

Word	Pronunciation	Meaning
reactive	*ree-**ak**-tiv*	A substance that reacts with many other substances or reacts very easily is reactive.
reactivity		A description of how quickly or vigorously something reacts.
reactivity series		A list of metals that shows them in order of their reactivity, with the most reactive at the top.

Science

8Gd – Quality evidence (Working scientifically)

Word	Pronunciation	Meaning
accurate	***ak**-yer-it*	A measurement that is close to the true value.
anomalous	*ah-**nom**-uh-luh s*	Something that does not fit a pattern. When talking about water, this means that water does not behave in the same way as other liquids when it freezes.
range		The difference between the highest and lowest values in a set of data (usually ignoring any anomalous results.
reliable	*ri-**lahy**-uh-buh l*	Results that are repeatable and reproducible.
repeatable		Results that are similar when repeated by the same experimenter.
reproducible		Results that are similar when repeated by different experimenters.

8Gd – Metals and acids

Word	Pronunciation	Meaning
acid	***ass**-id*	A substance that reacts with alkalis, turns litmus red, and has a pH of less than seven is acidic.
effervescence	*ef-er-**ves-ens***	The production of a gas in a reaction in a liquid.
salt		Compound (other than water or hydrogen) formed during the neutralisation of an acid with a base (or the reaction of a metal with an acid).

8Ge – Pure metals and alloys/Metals in art

Word	Pronunciation	Meaning
alloy	***al**-oi*	A metal with one or more other elements added to improve its properties.
boiling		When there is liquid turning into a gas in all parts of a liquid, creating bubbles of gas in the liquid.
boiling point		The temperature at which a liquid boils.
malleable	***mal**-ee-uh-buh l*	Able to be beaten and bent into shape.
melting point		The temperature at which a solid turns into a liquid.
mixture		Two or more substances jumbled together but not joined to each other. The substances in mixtures can often be separated from each other.
pure		A single substance that does not have anything else in it.

Science

8Ja – Seeing things

Word	Pronunciation	Meaning
absorb		'To soak up' or 'to take in'.
image		A picture that forms in a mirror or on a screen, or is made by a lens. You see an image when looking down a microscope.
longitudinal wave	*long-it-**tyewd**-in-al*	A wave where the particles vibrate in the same direction as the wave is travelling.
matter		All things are made of matter. There are three states of matter: solid, liquid, gas.
opaque	*o-payk*	Material that does not let light through. It is not possible to see through an opaque substance.
pinhole camera		A piece of apparatus that forms an image of an object on a screen when light rays travel through a tiny hole in the front.
ray		A narrow beam of light, or an arrow on a diagram representing the path of light and the direction in which it is travelling.
reflect		To bounce off a surface instead of passing through it or being absorbed.
reflected ray		A ray of light bouncing off a mirror.
shadow		A place where light cannot get to, because an opaque object is blocking the light.
source		Where a sound wave or other wave begins.
translucent	*trans-**loo**-sent*	Material that lets light through but scatters it. You cannot see things clearly through translucent materials.
transmit		To pass through a substance.
transparent		A material that light can travel through without scattering. (Note: transparent substances may be coloured or colourless.)
transverse wave		A wave where the vibrations are at right angles to the direction the wave is travelling.
vacuum	***vak**-yoom*	A completely empty space, containing no particles.

8Jb – Drawing and conventions (WS)

Word	Pronunciation	Meaning
angle of incidence	***in**-sid-dense*	The angle between an incoming light ray and the normal.
angle of reflection		The angle between the normal and the ray of light leaving a mirror.
convention		A standard way of doing something or representing something, so that everyone understands what is meant.
incident ray		A ray of light going towards the mirror or other object.
normal		An imaginary line at right angles to the surface of a mirror or other object where a ray of light hits it.
plane mirror		A smooth, flat mirror.
ray box		A piece of equipment that produces a narrow beam of light.

Science

Word	Pronunciation	Meaning
ray diagram		A diagram that represents the path of light using arrows.
ray tracing		A method of investigating what happens to light by marking the path of a light ray.
reflected ray		A ray of light bouncing off a mirror.

8Jb – Reflection

Word	Pronunciation	Meaning
diffuse reflection	*di-**fuse***	Reflection from a rough surface, where the reflected light is scattered in all directions.
law of reflection		The angle of incidence is equal to the angle of reflection.
specular reflection	***speck**-you-lar*	When light is reflected evenly, so that all reflected light goes off in the same direction. Mirrors produce specular reflection.

8Jc – Refraction

Word	Pronunciation	Meaning
angle of refraction		The angle between the normal and a ray of light that has been refracted.
converging lens		A lens that makes rays of light come together.
focal length		The distance between the centre of the lens and the focal point.
focal point		The place where parallel rays of light are brought together by a converging lens.
interface		The boundary between two materials.
lens		A curved piece of glass or other transparent material that can change the direction of rays of light.
refraction		The change in direction when light goes from one transparent material to another.

8Jd – Cameras and eyes

Word	Pronunciation	Meaning
aperture		A hole in a camera that controls how much light goes to the sensor.
cone cell		A cell in the retina that detects different colours of light.
cornea		The transparent front part of the eye, which covers the iris and pupil.
digital camera		A camera that uses electronics to record an image.
iris		The coloured part of the eye.
memory card		Part of a digital camera that stores the images.
optic nerve		The nerve that takes impulses from the retina to the brain.
primary colour		One of three colours that are detected by the cone cells in our eyes. The primary colours are red, green and blue.

Science

Word	Pronunciation	Meaning
pupil		The hole in the front of the eye that light can pass through.
retina		The part at the back of the eye that changes energy transferred by light into nerve impulses.
rod cell		A cell in the retina that detects low levels of light. It cannot detect different colours.
secondary colour		A colour made when two primary colours mix. The secondary colours are magenta, cyan and yellow.
sensor		An instrument that detects something. In a digital camera, the sensors detect light and change it to electrical signals.
shutter		A device that shields and protects the sensor in a digital camera. It opens when the picture is taken.

8Jd Lit – Giving a presentation

Word	Pronunciation	Meaning
scientific conference		A place where a lot of scientists gather together to hear about each other's ideas and to discuss them.
visual aid		Something that can be looked at during a presentation or lesson to help an explanation or provide further information. Examples include posters and computer presentations.

8Je – Colour

Word	Pronunciation	Meaning
dispersion		The separating of the colours in light, for example when white light passes through a prism.
filter (physics)		Something that only lets certain colours through and absorbs the rest.
frequency	***free**-kwen-see*	The number of vibrations (or the number of waves) per second. Different frequencies of light have different colours.
prism		A block of clear, colourless glass or plastic. Usually triangular.
spectrum		The seven colours that make up white light.
white light		Normal daylight, or the light from light bulbs, is white light.

Science

8La – Changing ideas

Word	Pronunciation	Meaning
Earth		The planet we live on.
Moon		The Moon (with a capital M) is the moon that orbits the Earth.
model		A way of showing or representing something that helps you to think about it or to find out about it.
orbit		The path that a planet takes around a star, or the path that a moon or satellite takes around a planet.
planet		A large object orbiting a star. The Earth is a planet.
Solar System		A star with planets and other objects orbiting around it.
star		A huge ball of gas that gives out energy – we see some of the energy as light.
Sun		The star that the Earth orbits.

8La – Gathering the evidence

Word	Pronunciation	Meaning
elliptical	*e-**lip**-tick-al*	oval-shaped
moon		A natural satellite of a planet.
phases of the Moon		The different shapes the Moon seems to have at different times.

8Lb – Seasons

Word	Pronunciation	Meaning
Equator	*ee-**kwate**-er*	An imaginary line around the middle of the Earth.
hemisphere	***hem**-ee-sfear*	Half of a sphere – the shape you would get if you cut a solid ball in half.
northern hemisphere		The half of the Earth with the North Pole in it. The UK is in the northern hemisphere.

8Lc – Magnetic Earth

Word	Pronunciation	Meaning
attract		Two things pulling towards each other.
compass		A magnetised piece of metal that can swing around. One end always points north.
field		The volume around something where a non-contact force can affect things. Examples are magnetic fields and gravitational fields.
field lines		Lines drawn to show which way a magnetic field acts.
magnetic field		The space around a magnet where it can affect magnetic materials or other magnets.
north-seeking pole		The end of a magnet that points north if the magnet can move freely. Often just called the north pole.
repel		Push away.
south-seeking pole		The end of a magnet that points south if the magnet can move freely. Often just called the south pole.

Science

8Lc – Gravity and the Solar System

Word	Pronunciation	Meaning
artificial satellite		A satellite made by humans.
gravitational field		The space around the Earth where the Earth's gravity affects things.
gravitational field strength		The force with which a gravitational field pulls on each kilogram of mass. The gravitational field strength ('*g*') on Earth is approximately 10 N/kg.
gravity		The force of attraction between any two objects. The Earth is very big and so has strong gravity that pulls everything down towards it.
natural satellite		A satellite that has not been made by humans. The Moon is a natural satellite of the Earth.
satellite		Anything that orbits a planet or a moon.
weight		The amount of force with which gravity pulls things. It is measured in newtons (N). Your weight would change if you went into space or to another planet.

8Ld WS – Making comparisons

Word	Pronunciation	Meaning
percentage		'Per cent' means 'out of 100'. A percentage is a way of comparing things to 100.

8Le – Beyond the Solar System

Word	Pronunciation	Meaning
constellation	*con-stell-**ay**-shun*	A pattern of stars. The stars in a constellation are not usually close together, they only appear to be close when seen from the Earth.
galaxy		Millions of stars grouped together.
light year		The distance that light travels in one year.
Milky Way		The galaxy that our Solar System is in.
Universe	***you**-nee-verse*	All the galaxies and the space between them.