Wadham School

A Church of England Community School

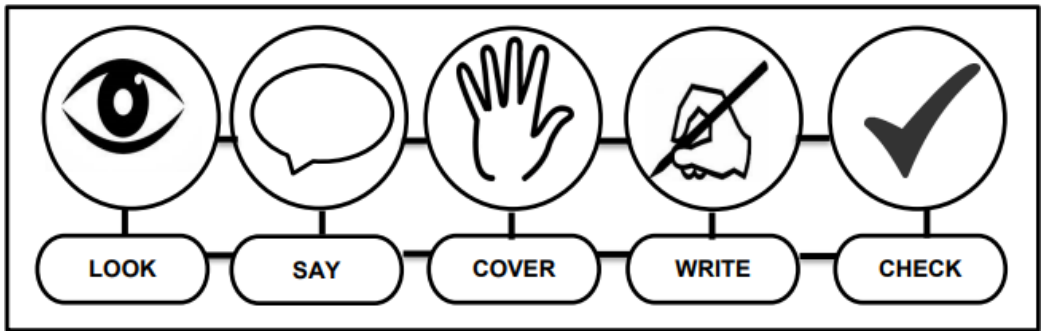
Knowledge Organisers
Year 10
Term 3 & 4
2024-2025

Name.....

Tutor group.....

"Life in all its fullness" John 10:10

Using Your Knowledge Organiser



Look-Say-Cover-Write-Check

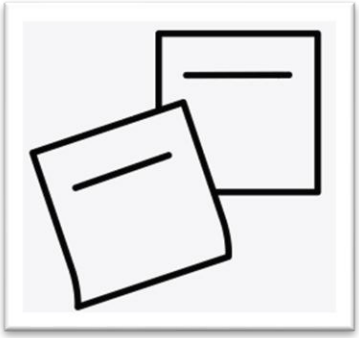
Retrieval practice using the look-say-cover-write-check technique, when done in regular small chunks, is one of the best ways you can learn relevant knowledge over time.

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.

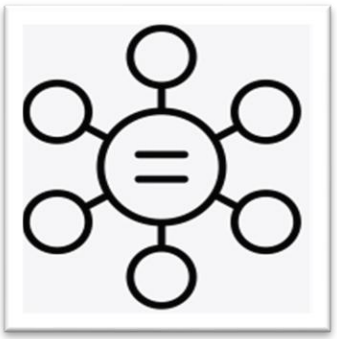


Self Quizing

Write quizzes with answers to test yourself in the future.

Mind maps

Create mindmaps linking key inforamtion you need to remember.



Drawing from Observation

Art

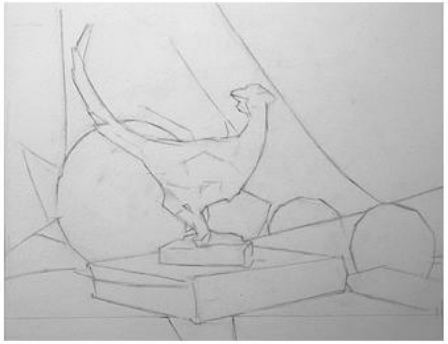
1. **Don't trace.** This shows minimal skill and teaches you very little.

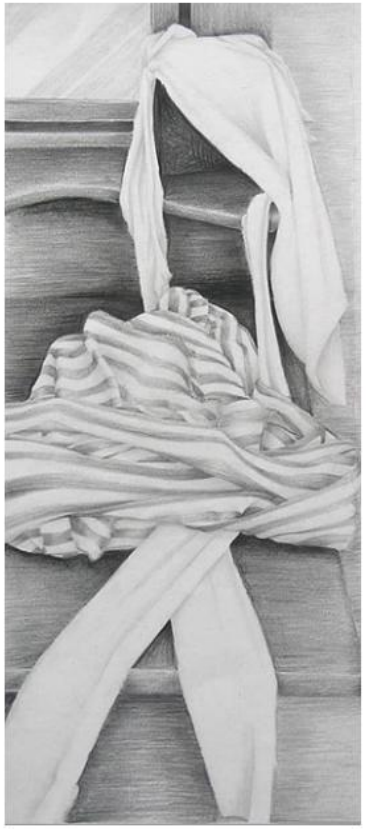
2. **Draw from real objects rather than photographs.** You cannot simulate the changing light conditions, rich textures views from different angles as well as information from other senses. It results in more authentic drawings.

3. **Use grids, guidelines or rough forms** to get the proportions right before you add details.

4. **Look at what you are drawing.** The only way to record shape, proportion and detail accurately is to look at the source of information. Human memory does not suffice!

5. **Understand perspective.** Objects get smaller as they get further away.





6. **Use mark-making to convey surface quality and texture.** Strike the paper in different ways to create a variety of effects.

8. **Include/omit detail as necessary.** It can be disheartening when drawing very complex subjects like trees but it is not necessary to replicate every leaf or stick. Sometimes a certain area of a drawing is rendered in full, with other parts trailing away.

9. **Be wary of ellipses** (the oval shapes that are visible at the top of cylindrical objects. Frequently a 'trip up' point.

10. **Keep the outlines light.** Real objects do not have dark lines running around every edge.

7. **Include a range of tones.** Observe where the light and dark areas are.

Assessment objectives
AO1 Develop ideas through investigations, demonstrating critical
understanding of sources

AO2 Refine work by exploring ideas, selecting and experimenting with
appropriate media, materials, techniques and processes

AO3 Record ideas, observations and insights relevant to intentions as
work progresses

AO4 Present a personal and meaningful response that realises
intentions and demonstrates understanding of visual language

A01
Critical studies:
Natural Forms
Andy Goldsworthy
Biomimicry

Andy Goldsworthy

Art, Craft and Design Knowledge organiser

AO1/A04 Analysis through critical studies

Context: When, where and why the work was created. Is the work characteristic of an artistic style, movement or time period?
Composition: Does the work communicate an action, narrative or story? Are there abstract elements? Has text been used? Does the title affect the way you interpret the work?
Shape and form: What is the overall size, shape and orientation of the artwork? Is there a dominant visual language within the shapes and forms? Are there any three-dimensional forms? How does this affect the work from different viewpoints?
Tone and contrast: Are there any reflective or transparent surfaces? Are shadows depicted in the work? What are the light sources within the artwork?
Colour: colour schemes? Contrasts? Colour palette?
Texture and pattern: Are there textural, tactile or surface qualities within the work? How are these created?
Materials and techniques: What materials have been used and why? Any specific properties? Whats sills or processes have been used?
Personal Response: What is your emotional response to the piece? How does it connect to your work and how are you going to be inspired by the artwork.

Areas of study:
- **Graphic communications**
- **Three Dimensional Design**
- **Textile Design**

Keywords:
Colour
Line
Form
Texture
Tone
Media
Processes
Materials
Techniques
Materials
Visual communication

Fariborz Sahba- Lotus Temple

AO2/AO3/AO4
Developing practical skills:
Exploring cardboard manipulation and mod roc castings.

Exploration of materials in response to students chosen area of study.

Building in drawing skills:
Weekly homework tasks to strengthen drawing skills

Beliefs and World Views

Topic 2: Ethical Issues in War and Conflict

18	**Conventional Warfare**	*Warfare fought with traditional weapons – Expensive and high casualties*
19	**Apocalyptic Warfare**	Warfare fought with Weapons of Mass destruction – Very high casualties
20	**Technological Warfare**	*Warfare fought with modern technologies – Can minimize casualties*

21	**Just War**	Criteria to determine if war is the right course of action
22	**Just Cause**	War can only be fought if there is a good reasons e.g. protect against invaders
23	**Legitimate Targets**	Non civilian targets cannot be impacted by war
24	**Reasonable Force**	Only use enough force to win – not to destroy in excess

25	**Pacifism**	Belief that war is not the right course of action

26	**Liberation Theology**	Belief Christianity's purpose should be freedom for the poor
27	**Oscar Romero**	Bishop in El-Salvador who preached Liberation Theology

26	**Israel**	Promised land of the Jews – Holy city of Jerusalem in its centre
27	**Palestine**	Arabic name for the land of Israel – They claim rights to the land also

Topic 3: Ethical Issues in Human Rights

	Human Rights	A right or freedom given to every person
	Examples:	Right to: education, privacy, free speech, a fair wage, religion,
	Universal Declaration	List of Human Rights created by the UN
	United Nations	Group of nations working together to improve life around the world
	Equality	Human rights are for all people, equally.

	Prejudice	Judging someone as inferior based on race, gender, religion etc.
	Discrimination	Treating someone differently due to prejudice
	Liberal Freedoms	How free and open a country is
	Capitalism	Social system focused on private wealth

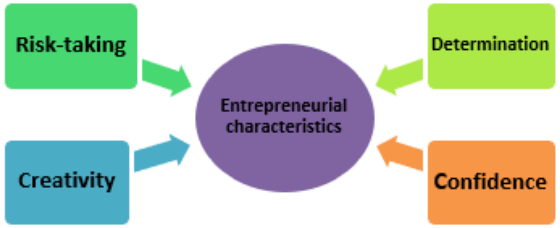
	Censorship	Government use of control over media
	Free Speech	Right to able to promote your views and beliefs without restriction

	Racism	Prejudice and Discrimination against people of different races or nationalities
	Black Lives Matter	Modern group aiming to bring greater equality and challenge racism

	Suffrage	Votes for all people – in this instance women
	Patriarchy	Society dominated by the needs of Males

1:1 Role of Business Enterprise and Entrepreneurship

Enterprise is: Seeing an opportunity to provide a product or service that people are willing to buy



Risk	Reward
▪ **Financial** Possibility of losing money ▪ **Health** The strain of being in charge can affect health ▪ **Strained relationships** Starting a business is time consuming	▪ **Financial** Some successful entrepreneurs can make a lot of money ▪ **Independence** Some people like to be their own boss ▪ **Self-satisfaction** Some people like to see and idea work

Entrepreneur
A person who takes the risk of starting and running a business

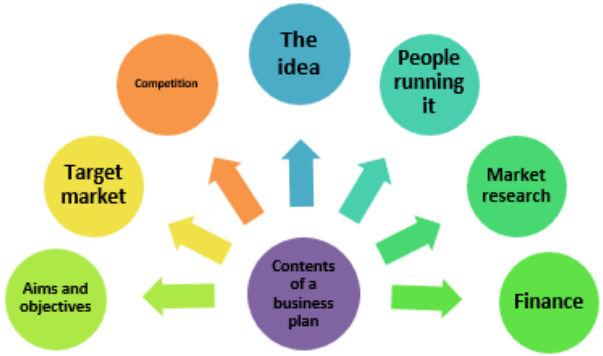
Enterprising characteristics
Features of an entrepreneur

1:2 Business Planning

Purpose of a business plan:

- To reduce the risk of starting a business
- To help a business succeed

A business plan: details how a business aims to achieve its objectives



Role of a business plan:

- Identify markets
- Helping with finance
- Identifying resources needed
- Achieving aims and objectives

Business plan
A simple plan which sets out the details of the business

Finance
The money needed to start the business

1:3 Business Ownership

Sole trader

Advantages	Disadvantages
▪ Easy to set up ▪ Little finance required ▪ Full control ▪ Keep all the profits ▪ Financial information is private	▪ Unlimited liability ▪ Business stops if ill or on holiday ▪ Long working hours ▪ Shortage of capital ▪ Skills shortage ▪ No continuity

Partnership

Advantages	Disadvantages
▪ More capital available ▪ Easy to set up ▪ More skills available ▪ Shared workload ▪ Financial information is private	▪ Shared profit ▪ Unlimited liability ▪ Shortage of capital ▪ Slower decision making ▪ No continuity

Private Limited Company (LTD)

Advantages	Disadvantages
▪ Limited liability ▪ Continuity ▪ Can raise capital more easily ▪ Control over share sale	▪ Financial information available to the public ▪ Complex and expensive to set up ▪ Sale of shares is restricted ▪ Dividends to be paid

Public Limited Company (PLC)

Advantages	Disadvantages
▪ Can raise large amounts of capital ▪ Easier to borrow money ▪ Limited liability for shareholders	▪ Possibility of a takeover ▪ Complex and expensive to set up ▪ Hard to manage as so large ▪ Financial information available to the public

Unlimited liability
Responsibility for the debts of the business rests with the owners

Capital
Money raised to start or develop a business

Deed of partnership
A document setting out the operations of the partnership

Sleeping partner
Someone who only invests in a partnership

Limited liability
Responsibility for the debts of the business is limited to the amount invested

Shareholders
Owners of a limited company

Dividend
Money paid to shareholders from business profits

Child Development

Topic area 4: Early Years PROVISION

Voluntary setting/ provision - A provision that is set up and funded by donations and contributions: charity or church run group.
Private setting - A provision that parents will need to pay for and is private: private nursery, childminders home
Statutory setting - A provision that is government funded and have to be available by law; schools.
Independent setting - A provision that is used by independent schools which are not government funded so parents will be charged for them; an independent school nursery.

Early years setting - where children's learning and development is nurtured by adults. 0-5 years, English settings only, sets standards for learning, taught through game and play, reviewed when they're between 2 and 3 (two year check), based on classroom observation, reception baseline assessment
**Childminder, school based nursey, reception class, children's centers, day nursery, out of school clubs and play centers, parent and toddler groups, playgroup/ preschool, workplace nursey, nanny/ home carer, creche

OFSTED - a government organisation that inspects different services that care for children and young people who provide educational opportunities
EYFS - Early Years Foundation Stage - this sets out the requirements for children's learning and development from birth to five years

Considerations when choosing childcare settings - location, cost, travel, opening times, facilities, policies
Barriers when choosing childcare settings - affordability, travel and accessibility, opinions, religion, lifestyle, language, mental health, area
Policies and procedures - Early years settings (EYFS) need to have policies and procedures in place to ensure the safety and well-being of children

Topic area 5:

Legislation - Set of laws passed by parliament
Framework - Standards that must be met
Policy - Action adopted by an organisation
Procedure - A way to carry out a policy

Health and Safety at work Act 1974 - Everyone working in an early years and childcare setting is responsible for maintaining a safe and healthy environment for all; ensuring that children and staff remain protected from any hazards of working or being in a nursery. eg,reporting any health and safety concerns and following health and safety policies and procedures
Data Protection 2018- Confidentiality.
GDPR - outlines how a school or setting will safely collect, store and dispose of the data you collect. GDPR's security/integrity principle means there needs to be measures in place to protect private information. Privacy would also mean to make sure to either leave them alone when they ask for it, and also to give them privacy.
United Nations Rights of the Child 1989. The UNCRC is an international agreement that protects the rights of the children and provides a child-centred framework for the development services for children. All

Child Development

children have basic needs, and it is their universal right to have these met to ensure each child in the world can develop to their full potential. A childcare provider must safeguard all children in the workplace and report any abuse, provide play, adapt activities to ensure equality and diversity.

Equality Act – This legislation protects the rights of individuals and promotes equality of opportunity. It applies to all childcare providers, including private nurseries, independent schools, and local authority establishments. The Equality Act requires early years providers to:

- Make reasonable adjustments for disabled children
- Promote equality of opportunity
- Remove physical barriers
- Treat all people equally and fairly

EYFS The EYFS is the governing body for equality and diversity in childcare. It sets standards for childcare providers to ensure children grow up in a diverse environment. The EYFS encourages staff, parents, carers, and stakeholders to:

- Be aware of and stand against racism
- Treat all people equally and fairly

To ensure equality and diversity in early years settings, practitioners can;

- Provide representation of different races, disabilities, ages, and family types
- Use role-play clothing that reflects diverse cultures
- Use household items that reflect various cultures and communities
- Have practitioners with some of the same identity features as children and families

Equality – everyone should be treated fairly and have the same opportunities, regardless of their differences.

Diversity - recognizing and valuing people's differences, including their backgrounds, knowledge, skills, and experiences

Inclusion - the policy or practice of making sure that everyone in society has access to resources and opportunities.

Confidentiality – the protection of personal information and is based on the idea that information should not be disclosed without the person's consent or legal authority. Safeguarding files at a nursery are confidential and must be kept in locked online or paper file

Safeguarding – Protecting others from harm. The act of protecting a person's health, wellbeing, and human rights, and ensuring they are free from harm, abuse, and neglect

Physical - any intentional act causing injury or trauma to another person through bodily contact.

Emotional – Psychological abuse, is the use of words and actions to manipulate, hurt, scare, or upset someone

Sexual – abusive sexual behaviour by one person upon another.

Neglect – the persistent failure to meet a child's basic physical and/or psychological needs, likely to result in the serious impairment of the child's health or development.

Whistleblowing – when someone raises the concern of about a dangerous or illegal activity or any wrongdoing within their organisation

Observation – the act of paying close attention to a child's behaviours, interactions, activities, and interests. It's a fundamental professional skill that helps childcare providers understand how children develop, learn, and progress

The three prime areas to observe in EYFS

1. Communication and language

Child Development

2. Physical development
3. Personal, social and emotional development

Fairness - the quality of treating people equally or in a way that is right or reasonable. It can also mean considering all factors that affect a situation to make a fair judgment

EAL - English as an Additional Language and refers to children who are learning English as a second language

Medical conditions/ need - A disease, illness or injury; any physiologic, mental or psychological condition or disorder; Diabetes, asthma, allergy, intolerance, might require regular medication

Disabilities - a condition that makes it more difficult for a person to do certain activities or interact with the world around them; Deafness, blindness

Special educational need – it might present itself as medical, behavioural, learning, disabilities
Children with an SEN need usually find it more difficult to learn compared to others the same age.
It can also be referred to as SEN/D – Special Educational Needs and Disabilities

SENCO - Special Educational Needs Coordinator. This person in your setting makes sure that the needs of children with SEN

EHCP - A legal document which describes a child's special educational, health and social needs. It provides childcare settings with guidance on how to meet that child's needs and how to promote development.

Design and Technology - Materials and their properties

Thermoforming polymer	Physical properties	Working properties
Acrylic (PMMA)	Hard, brittle, shiny, available in a wide range of colours	Resists weather well, can be cut, folded and polished well, scratches easily, used for car headlights, visors and baths
Polystyrene (PS)	Rigid, cheap, available in a lot of colours	Can be cut and vacuum formed easily, food safe but toxic when burned, used for CD cases and yoghurt pots
High density polyethylene (HDPE)	Stiff, strong, lightweight	Lightweight and flexible, can be recycled well, used for washing baskets, pipes and chairs
Polypropylene (PP)	Easily coloured, available in sheets	Tough and flexible, used for plastic chairs and casings
Polyvinyl chloride (PVC)	Cheap, can be matt or high gloss	Brittle but durable, can be extruded or in flat sheets, used in blister packs and window frames
Polyethylene terephthalate (PET)	Clear, smooth finish	Light, strong and tough, used for clothing and drinks bottles
Low density polyethylene (LDPE)	Low cost, processed through all common manufacturing processes.	Resistant to moisture and chemicals. Used in bottles, containers and packaging
Acrylonitrile butadiene styrene (ABS)	Strong, tough and lightweight, good surface finish	Durable material, resistant to chemicals and water, ideal for injection moulding, used on keyboards, toy bricks and casings of products such as drills
Thermoplastic elastomer (TPE)	Properties of natural rubber but processed like other plastics, flexible and stretchy	Excellent weather resistance and shock absorption, long-lasting, used on wires, grips on handles and seals

Thermosetting polymer	Physical properties	Working properties
Epoxy resin (ER)	Supplied as two parts, one resin and one hardener (see image) - the resin and hardener combine to create an extra-strong adhesive	Rigid and durable, strong, expensive and heat resistant, used to bond materials, waterproof coatings and lamination
Melamine formaldehyde (MF)	Hard, brittle	Food safe, printable surface, used for picnic wear
Silicone	Odourless and colourless material	Strong resistance to chemicals, heat and water, used in medical implants and kitchenware such as ice cube trays and cooking utensils
Polyester resin (PR)	A resin and a hardener, sets clear and smooth	Strong, heat resistant and good insulator, used as waterproofing and for encapsulating items
Urea formaldehyde (UF)	Smooth finish, available in limited colours	Heat resistant, hard, brittle and easily injection moulded, used for electrical fittings

Softwood	Physical properties	Working properties
Cedar	Reddish brown in colour, straight grain and coarse texture	Easily worked with tools and machines, glues and finishes well, used in joinery and cladding
Pine	Pale coloured with aesthetically pleasing grain	Lightweight, easy to form, used for construction and decking
Spruce	Pale cream with an even grain	Easy to form, takes stain colour well, used for construction and furniture

Design and Technology - Materials and their properties

Ferrous metal	Physical properties	Working properties
Mild steel (low-carbon steel)	An alloy that is grey and smooth, rusts if not protected	Ductile and tough, easy to form, braze and weld, versatile, useful for construction, nuts, bolts, bike frames
Cast iron	Dull grey, rusts easily	Brittle if thin, can be cast in a mould, used for manhole covers, pans and gates
Stainless steel	Ferrous metal that is silver when polished, resists rust	An alloy of chromium, nickel and manganese, hard and smooth, used for cutlery and sinks

Non-ferrous metal	Physical properties	Working properties
Aluminium	Light grey with a matt finish	Lightweight but strong and ductile, used for drink cans, kitchen utensils and some parts in transport
Copper	Rose coloured, polishes well but can oxidise to a green colour (verdigris)	Good electrical conductor, can be polished, welds easily, used for plumbing parts and electrical cable
Tin	Silver coloured	Soft and malleable, easy to form, used to make food cans
Zinc	Silvery blue with a matt finish	Brittle with average malleability and conductivity, often used to galvanise steel

Alloy	Physical properties	Working properties
Brass	Non-ferrous metal that is gold coloured and darkens when oxidised with age	An alloy of copper and zinc, can be cast and machined, used for musical instruments and ornamental hardware
Pewter	Non-ferrous metal that is dark grey in colour, when melted it appears a brighter shinier shade of grey	Made up of tin (approximately 90 per cent), antimony (7 per cent) and other metals such as copper or bismuth, it has a low melting point (approximately 200°C), often used to make jewellery, candlesticks, outside light fixtures or tankards
Solder	Grey in colour and typically comes in long reels 2 mm to 5 mm thick, although different sizes are available	An alloy of 60 per cent tin and 40 per cent lead, it has a low melting point (approximately 200°C), and is electrically conductive making it ideal for circuit manufacture

Hardwood	Physical properties	Working properties
Birch	Creamy white or yellow colour	Well worked by machines, can be steam bent and is resistant to preservatives, used in joinery and plywood
Beech	Slight pink tint, close grain	Tough, durable and smooth to finish, used on high-quality furniture
Teak	Coarse uneven texture with oily feel, usually straight grained	Produces own natural oils, can be cut well and glues well, used on outdoor furniture and boats
Oak	Moderate-brown colour with unique and attractive grain markings	Tough and durable, polishes well, used for quality furniture
Balsa	Pale and wide-spaced grain due to it being a fast-growing hardwood	Very soft and easy to form, often used to make models

AQA English Language – Paper 2

Question Guidance (do the paper backwards):
Q5 – use the Presently, Personally, Publicly, Predictably frame to structure your response:
[Form feature: IF Article: headline & subheading
IF Letter: Dear Mr ???,

I am writing to you about…
IF Speech: 'Today I am here to talk to you about…']
Presently, we are like mindless addicts; preferring the heady rush of flippant fools and funny failures. Today's society is so immersed in the blizzard of triviality that [link to topic].

Personally, my own children, Edward and Alice, [link to topic]. It is easy to dismiss this as unimportant but the noxious influence of [topic] is as pervasive as it is dangerous.

Publicly, they (like so many their age) have [link to topic]. According to figures from Exeter University, over 75% of people [link to topic]. Professor Hill, who co-authored the report, stated: 'The issue with [topic] is a different kind of epidemic; causing untold damage. It is arguably worse because there is no vaccine.'

We must stop this!

Predictably, some people will… [consider opposing view] but this only perpetuates the problem. We have two options: continue with this intolerable situation or move forward to a future where we [positive link to topic]. Which would you rather choose?
[Form feature:
IF Article: do not add anything - end on the rhetorical question.
IF Letter: Yours sincerely,
[Your Name]
IF Speech: Thank you for listening.]

Q4 (16 marks, 20m) - compare writer's perspectives
Make links
Neat evidence – use precise quotations
Additional – link quotations across both sources
Language – analyse imagery, word choice and other methods
Structure and form – analyse perspective, tone and other methods
Intentions of writer – consider why it has been written and the impact on the reader
Your evaluation – consider which text demonstrates more or less of something

Q3 (12 marks, 15m) - analyse language
Imagery – always analyse this.
Neat evidence – as precise as possible – focus on word choices etc.
Additional – get a wide range of quotations
Language – analyse word choices, imagery and other methods such as metaphor, simile, personification, oxymoron, emotive language and syntax.

Q2 (8 marks, 10m) - summarise an idea across both texts
Make links, use neat evidence (borrow from Q4) and infer considering impact on reader.

Q1 (4 marks, 5m) - identify 4 true statements from a list of 8.

AQA English Literature – An Inspector Calls

Prepared introduction (learn this):

Priestley presents _____ to criticise capitalist culture within Edwardian England. As a socialist, Priestley wanted to inspire the younger generation in his WW2 audience to progress to a fairer and more equal society. Priestley crafts this through the cyclical structure to subvert the murder mystery genre so that rather than believing 'a man has to mind his own business' we realise that 'we are all responsible for each other'.

Make sure that you replace _____ with the focus of the question.

Key quotations to learn – prioritise the first 3 pairs.

1.	**'Burnt** her inside out'	**'Fire** and blood and anguish'
2.	**'unsinkable**, absolutely unsinkable'	'we're all in it – up to the **neck'**
3.	'obscene fat **carcass'**	'We are members of one **body'**
4.	'A **chain** of events'	'He's giving us the **rope** - so that we'll hang ourselves'
5.	'I'd give **thousands** - yes, thousands'	**'Millions** and millions and millions of Eva Smiths'
6.	'Look – **mummy** – isn't it a beauty?' / 'I'm sorry, **daddy'**	'Don't interfere, please, **father'** / **'Mother** - stop - stop!'
7.	'(with sharp sarcasm)...You were the wonderful **Fairy Prince**.'	'young and **fresh** and charming''
8.	'Girls of that **class**-' / 'Girls of that **sort'**	'You mustn't try to build up a kind of **wall** between us and that girl'
9.	'she was pretty and a good **sport'**	'Just used her…as if she was an **animal**, a thing, not a person'
10.	'it's better to ask for the **earth** than to take it.'	'To ask some – **questions'**

English Literature

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.

An Inspector Calls

Key words	Definition
Capitalism	the idea of an economic system being based upon private wealth and ownership.
Socialism	a system of economic management and governance whereby everyone in society has a shared ownership or stake in the means of production, distribution and exchange.
Dramatic irony	When the audience know more than the characters, e.g. 'unsinkable' (The Titanic)
Cliffhanger	When the audience are left in suspense at the end of each act.
Lighting & props	The change of lighting at the beginning of the play; the use of the photography, the ring and the telephone.
Entrances & exits	Priestley crafts these so that characters enter or disappear / reappear at significant moments.
The Three Unities	The unity of time (the play happens in chronological order), the unity of action (one storyline), and the unity of place (one continuous setting).
Genre	The form of the play: it subverts the murder mystery and morality play genres
Stage directions	Instructions given to the actors, usually in brackets. These are worth analysing . Look particularly at how they change for some characters.

Film Studies

Film Studies – Timeline of key developments in film and film technology	
1895	First moving images (Lumiere Brothers).
THE RISE OF HOLLYWOOD	
1895 - 1927	Development of silent cinema from early short films to full-length feature films, during which period the foundations of filmmaking were established (e.g. cinematography, the principles of lighting and continuity editing and an extensive range of mise-en-scene, including location shooting).
1917	Technicolour: Technicolour Motions Picture Corp. was the first company to make a film using technicolour – 'The Gulf Between' (1917).
1920s	Gradual emergence of vertically integrated Hollywood film industry, established by 1930 into FIVE major studios (Paramount, Warner Bros., Loew's/MGM [Metro Goldwyn Mayer], Fox [20th Century Fox in 1935] and Radio Keith Orpheum [RKO]) and three minor studios (Columbia, Universal and United Artists) … These were known as the Big 5 and Little 3.
THE DEVELOPMENT OF SOUND	
1927	Alan Crosland's 'The Jazz Singer', starring Al Jolson, is known as the first 'talkie' although only 354 words are spoken in it. Within 3 years most feature films became talkies. It is also the first film to feature a soundtrack.
1935	Rouben Mamoulian's Becky Sharp, the Technicolor Corporation's first feature length, 'three strip' colour film.
1948	Paramount court case which prevented studios from owning all phases of the production, distribution and exhibition process ('vertical integration') which led, in the 1950s, to the emergence of independent film production and agents producing films for the Hollywood studios to distribute and exhibit.
THE EMERGENCE OF WIDESCREEN TECHNOLOGIES	
1950s	Emergence of widescreen and 3D technologies as a response to the growth of television and the corresponding decline in cinema attendance.
1952	Cinerama is unveiled by film bosses who decide that size really does matter. Unfortunately, they soon find that huge pictures mean huge costs. Cinerama eventually becomes obsolete.
Late 1952	The Golden era of 3D began with the release of the first colour stereoscopic feature, 'Bwana Devil' produced by Arch Oboler.
Late 1950s	Although not the first examples, lightweight, portable cameras were produced suitable for hand-held use (which had an immediate impact on documentary filmmaking and were used by a new generation of directors in France – French 'new wave' directors).
1970s	Steadicam technology developed by cinematographer Garrett Brown (a stabilising device for hand-held cameras to keep the image 'steady' whilst retaining fluid movement). First introduced in 1975 and was first used in the 1976 film 'Bound for Glory'.

Film Studies

1990s onwards	More widespread use of computer-generated imagery resulted in a move away from filmed 'special effects' to visual effects created digitally in post-production to the computer-generated imaging (CGI) of characters in films.
THE MOVE INTO MODERN CINEMA	
1995	First CG (computer generated) feature length cartoon – 'Toy Story' directed by Jon Lasseter for Pixar Animation Studios.
2000s	Technology available to ordinary people makes significant strides due to developments with lightweight cameras and mobile phone technology, seeing a rise in 'citizen filmmaking'.
2007	Netflix – the first legal streaming service for film and TV is launched.
2010s	Successful feature length films shot entirely on I-phones now released – notable releases include 'Tangerine' (Baker, 2015) and 'Unsane' (Soderberg, 2018).
2017	Film and TV streaming and download sites such as Netflix, Sky, Amazon and Apple overtake DVD sales for the first time increasing by 23% in one year.
2018	'Avengers: Infinity War' becomes the first Hollywood film to ever be shot entirely with IMAX cameras.

Food science

Functions of ingredients
Ingredients provide a variety of functions in recipes.

Carbohydrate, protein and fat
Carbohydrate, protein and fat all have a range of properties that make them useful in a variety of food products.

Carbohydrates perform different functions in food.
They can:
- help to cause the colour change of bread, toast and bakery products **(dextrinisation);**
- contribute to the chewiness, colour and sweet flavour of caramel;
- thicken products such as sauces and custards **(gelatinisation).**

Maillard reaction
Foods which are baked, grilled or roasted undergo colour, odour and flavour changes. This is primarily due to a group of reactions involving amino acids (from protein) and reducing

Dextrinisation
When foods containing starch are heated they can also produce brown compounds due to dextrinisation. Dextrinisation occurs when the heat breaks the large starch polysaccharides into smaller molecules known as dextrins which produce a

Caramelisation
When sucrose (table sugar) is heated above its melting point it undergoes physical and chemical changes to produce caramel.

Gelatinisation
When starch is mixed with water and heated, the starch granules swell and eventually rupture, absorbing liquid, which thickens the mixture. On cooling, if enough starch is used, a gel forms.

Proteins perform different functions in food products.
They:
- **aerate foods**, e.g. whisking egg whites;
- **thicken sauces**, e.g. egg custard;
- bind ingredients together, e.g. fishcakes;
- **form structures**, e.g. gluten formation in bread;
- **gel**, e.g. lime jelly.

Gluten formation
Two proteins, gliadin and glutenin, found in wheat flour, form gluten when mixed with water. Gluten is strong, elastic and forms a 3D network in dough. In the production of bread, kneading helps untangle the gluten strands and align them. Gluten helps give structure to the bread and keeps in the gases that expand during cooking.

Gelation
Gelatine is a protein which is extracted from collagen, present in animal connective tissue. When it is mixed with warm water, the gelatine protein molecules start to unwind. On cooling, a stable, solid network is formed, trapping the liquid.

Denaturation
Denaturation is the change in structure of protein molecules. The process results in the unfolding of the protein's structure. Factors which contribute to denaturation are heat, salts, pH and mechanical action.

Coagulation
Coagulation follows denaturation. For example, when egg white is cooked it changes colour and becomes firmer (sets). The heat causes egg proteins to unfold from their coiled state and form a solid, stable network.

Aeration
Products such as creamed cakes need air incorporated into the mixture in order to give a well-risen texture. This is achieved by creaming a fat, such as butter or baking spread, with sugar. Small bubbles of air are incorporated and form a stable

Fats performs different functions in food.
They help to:
- add 'shortness' or 'flakiness' to foods, e.g. shortbread, pastry;
- provide a range of textures and cooking mediums;
- glaze foods, e.g. butter on carrots;
- aerate mixtures, e.g. a creamed cake mix;

Plasticity
Fats do not melt at fixed temperatures, but over a range. This property is called plasticity.

Raising agents
Raising agents include anything that causes rising within foods, and are usually used in baked goods. Raising agents can be:
- biological, e.g. yeast;
- chemical, e.g. baking powder;
- mechanical, e.g. adding air through beating or folding.

Functional ingredients
These are ingredients that are specifically included in food for additional health benefits. They include:
- **probiotics** – 'good' bacteria that may have a positive impact on human health;
- **prebiotics** – food ingredients that promote the growth of beneficial microorganisms in the gut;
- **sterols/stanols** – compounds that can lower cholesterol;
- **healthy fats** (e.g. omega-3);
- **added vitamins and minerals** (more than in the original food).

Colloidal systems
Colloidal systems give structure, texture and mouthfeel to many different products.

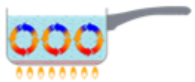
System	Disperse phase	Continuous phase	Food
Sol	Solid	Liquid	Unset jelly
Gel	Liquid	Solid	Jelly
Emulsion	Liquid	Liquid	Mayonnaise
Solid emulsion	Liquid	Solid	Butter
Foam	Gas	Liquid	Whipped cream

Why is food prepared and cooked?
Food is prepared and cooked to:
- make the food more palatable – improves flavour, texture and appearance;
- reduce the bulk of the food;
- provide variety and interest to meals.

Methods of cooking food
The methods of cooking are divided up into groups. These are based on the cooking medium used.
They are:
- moist/liquid methods, e.g. boiling;
- dry methods, e.g. grilling;
- fat-based, e.g. frying.

Selecting the most appropriate way of preparing and cooking certain foods is important to maintain or enhance their nutritional value.
- Vitamins can be lost due to oxidation during preparation or leaching into the cooking liquid.
- Fat-based methods of cooking increase the energy (calories) of the food.
- The use of different cooking methods affects the sensory qualities of the food.

There are three ways that heat is transferred to food.
- **Conduction** – the exchange of heat by direct contact with foods on a surface.
- **Radiation** – energy in the form of rays.
- **Convection** – currents of hot air or hot liquid transfer the heat energy to the food.



Key terms
Conduction: The exchange of heat by direct contact with foods on a surface.
Convection: Currents of hot air or hot liquid transfer the heat energy to the food.
Functional ingredients: Included in food for additional health benefits.
Heat transfer: Transference of heat energy between objects.
Radiation: Energy in the form of rays.

Tenderisation
- **Mechanical tenderisation** – a meat cleaver or meat hammer may be used to beat the meat. Cutting into small cubes or mincing can also help.
- **Chemical tenderisation** (marinating) –the addition of any liquid to flavour or soften meat before cooking.

Year 10 French Module 3: Ma vie scolaire (1).

Au collège chez nous	*At school where we live*
Décris les personnes	*Describe the people*
Sur la photo,	*In the photo,*
Il y a …	*There is/are…*
(un) garçon / (trois) filles.	*(a) boy / (three) girls.*
Il y a aussi …	*There is also …*
un professeur / *une professeure.	*a teacher.*
Un garçon / Une fille porte …	*A boy / A girl is wearing …*
une chemise blanche.	*a white shirt.*
un pantalon gris.	*grey trousers.*
un *short bleu.	*blue shorts.*
des baskets noires.	*black trainers.*
un uniforme scolaire.	*school uniform.*
C'est où?	*Where is it?*
Ils/Elles sont …	*They are …*
au collège.	*at school.*
à la *cantine.	*in the canteen.*
dans une salle de classe.	*in a classroom.*
sur le terrain de foot(ball).	*on the football pitch.*
Au premier plan, il y a …	*In the foreground, there is/are*
des élèves / livres.	*some pupils / books.*
de la **nourriture.**	*some food.*
À l'arrière-plan, il y a des …	*In the background, there are some …*
arbres / fenêtres.	*trees / windows.*
ordinateurs / tables.	*computers / tables.*
Que font-ils?	*What are they doing?*
Les élèves / enfants …	*The pupils / children …*
jouent.	*are playing.*
travaillent.	*are working.*
Le/La prof / Un garçon / Une fille …	*The teacher … / A boy … / A girl …*
discute.	*is talking.*
mange.	*is eating.*

Quelle est ta matière préférée?	*What is your favourite subject?*
Ma matière préférée est …	*My favourite subject is …*
J'aime …	*I like …*
J'adore …	*I love …*
Je n'aime pas …	*I don't like …*
Je déteste …	*I hate …*
parce que …	*because …*
je suis *créatif/creative.	*I'm creative.*
je suis sportif/sportive.	*I'm sporty.*
le/la prof est sympa / **sévère.**	*the teacher is nice / strict.*
on a trop de devoirs.	*we have too much homework.*
Je suis fort(e) / faible en …	*I'm good / bad at …*
anglais.	*English.*
*informatique.	*ICT.*
Je trouve (le français / la musique / les maths) …	*I find (French / music / maths) …*
facile(s).	*easy.*
difficile(s).	*difficult.*
utile(s).	*useful.*
amusant(e)(s).	*fun.*
intéressant(e)(s).	*interesting.*
passionnant(e)(s).	*exciting.*
ennuyeux/ennuyeuse(s).	*boring.*
Je pense que …	*I think that …*
(l'anglais) est plus/moins … que …	*(English) is more/less … than …*
(les maths) sont plus/moins … que …	*(maths) is more/less … than …*
*la biologie.	*biology.*
*la chimie.	*chemistry.*
*l'EPS.	*PE.*
*l'histoire-géo.	*history/geography.*
le théâtre.	*drama.*
Ici, …	*Here, …*
Au Canada / *Sénégal …	*In Canada / Senegal …*
En France, …	*In France …*
À la Martinique …	*In Martinique …*
la journée scolaire est plus courte …	*the school day is shorter …*
la pause-déjeuner est plus longue …	*the lunch break is longer …*
qu'ici.	than here.
qu'au Canada / *Sénégal.	*than in Canada / Senegal.*
qu'en France.	*than in France.*
qu'à la Martinique.	*than in Martinique.*
Les cours commencent à …	*Lessons start at …*
Le collège commence / finit à …	*School starts / finishes at …*
On n'a pas de cours le samedi …	*We don't have school on Saturdays …*
ils ont cours le samedi …	*they have school on Saturdays*
et je trouve ça …	*and I find that …*
important.	*important.*
intéressant / utile.	*interesting / useful.*

C'est injuste!	*It's unfair!*
Il faut …	*You have to …*
Il est essentiel / important de …	*It is essential / important to*
porter l'uniforme scolaire.	*wear the school uniform.*
faire ses devoirs.	*do your homework.*
s'asseoir à sa place.	*sit down in your seat.*
respecter les profs.	*respect the teachers.*
Il ne faut pas / jamais …	*You must not / never …*
Il est interdit de/d' …	*It is forbidden to …*
arriver en retard.	*arrive late.*
manger en classe.	*eat in class.*
*harceler d'autres élèves.	*bully other pupils.*
utiliser son portable en classe.	*use your mobile phone in class.*
Quel est ton avis sur les règles?	*What is your opinion of the rules?*
À mon avis, c'est …	*In my opinion, it's …*
un peu / assez	*a bit / quite*
très / trop	*very / too*
important.	*important.*
juste / injuste.	*fair / unfair.*
nul / *stupide.	*rubbish / stupid.*
strict / **sévère.**	*strict.*

Year 10 French Module 3: Ma vie scolaire (2).

C'est injuste! (cont.)	*It's unfair! (cont.)*
parce que/qu' / car …	*because / as …*
c'est important pour les examens	*it's important for exams*
c'est essentiel pour le travail scolaire	*it's essential for schoolwork*
il faut respecter les autres	*you must respect others*
l'uniforme scolaire (n')est (pas)	*the school uniform is (not)*
confortable / pratique	*comfortable / practical*
j'ai toujours faim en classe	*I'm always hungry in class*
Tu es d'accord?	*Do you agree?*
Oui, je suis d'accord.	*Yes, I agree.*
Non, je ne suis pas d'accord.	*No, I disagree.*
donc	*therefore*
on a organisé / nous avons organisé des **manifestations**	*we organised protests*
le directeur/la directrice	*the headteacher*
Il/Elle n'a pas changé les règles.	*He/She hasn't changed the rules.*

Souvenirs d'école	*Memories of school*
Quand tu étais petit(e), tu étais comment?	*When you were little, what were you like?*
Quand j'étais petit(e) …	*When I was little, …*
j'étais / je n'étais pas …	*I was … / I wasn't …*
(très) travailleur/travailleuse.	*(very) hard-working.*
(très) créatif/créative.	*(very) creative.*
l'enfant le plus sportif de la classe.	*the sportiest child in the class.*
J'aimais (beaucoup / bien) l'anglais / la musique.	*I liked English / music (a lot).*
Je jouais de *la clarinette dans un *orchestre.	*I played the clarinet in an orchestra.*
Je lisais *des magazines.	*I read magazines.*
Je trouvais (l'EPS) ennuyeux.	*I found (PE) boring.*
Tu allais à l'école comment?	*How did you go to school?*
J'allais à l'école …	*I went to school …*
à pied / à vélo.	*on foot / by bike.*
en bus / en voiture.	*by bus / by car.*
Qu'est-ce que tu aimais, comme matières?	*Which subjects did you like?*
Ma matière préférée était …	*My favourite subject was …*
J'aimais (beaucoup / bien) …	*I liked … (a lot)*
Qu'est-ce que tu faisais pendant *la pause-déjeuner?	*What did you do during the lunch break?*
Je mangeais à *la cantine.	*I ate in the canteen.*
Je jouais au foot(ball) avec mes amis / **copains**.	*I played football with my friends.*
Qu'est-ce que tu faisais après l'école?	*What did you do after school?*
J'aidais (mon frère / mon père) (sur son	*I helped (my father / my brother) (on his*
bateau / à la cuisine)	*boat / in the kitchen)*
Je faisais mes devoirs.	*I did my homework.*
Je regardais la télé.	*I watched TV.*
Je jouais avec (mon frère).	*I played with (my brother).*

As-tu fait des progrès?	*Did you make progress?*
J'ai / Il/Elle a …	*I have / He/she …*
appris beaucoup de choses.	*learned lots of things.*
bu du coca en classe.	*drank cola in class.*
couru dans *le couloir.	*ran in the corridor.*
écrit une histoire extraordinaire.	*wrote an extraordinary story.*
fait beaucoup de progrès.	*made a lot of progress.*
reçu de bonnes / mauvaises notes (en …).	*got good / bad grades (in …).*
lu beaucoup d'**articles.**	*read lots of articles.*
pris des photos **exceptionnelles**.	*took exceptional photos.*
Je n'ai jamais oublié (de faire) mes devoirs.	*I have never forgotten (to do) my homework.*
Je n'ai rien appris (en …).	*I have learned nothing (in …).*
Je n'ai pas …	*I have not …*
fait beaucoup d'efforts (en)	*made a lot of effort (in…).*
un(e) élève **moyen(ne)**	*an average student*
le/la prof le/la plus sympa	*the nicest teacher*
le garçon le moins travailleur	*the least hard-working boy*
l'acteur le plus fort	*the best actor*
le/la meilleur(e) élève	*the best student*
le/la pire prof …	*the worst teacher …*
de la classe / du collège	*in the class / in the school*
ma matière préférée, c'est	*my favourite subject is …*
*le dessin / l'histoire-géo/ la musique / l'EPS / la technologie	** Art / history-geography / music / PE / DT*
faible	*weak*
*gentil/gentille	*kind*
*intelligent(e)	*intelligent*
sympa	*nice*

Les langues à l'avenir	*Languages in the future*
À l'école primaire, est-ce que tu apprenais une langue **étrangère**?	*At primary school, did you learn a foreign language?*
Oui, j'apprenais …	*Yes, I learned …*
Oui, je **n**'apprenais **que** …	*Yes, I only learned …*
*l'allemande / l'espagnol / le français / l'italien / le mandarin / le roumain.	*German/ Spanish / French / Italian / Mandarin / Romanian.*
Non, je **n**'apprenais **aucune** langue **étrangère**.	*No, I didn't learn any foreign languages.*
Au collège, tu apprends quelles langues **étrangères**?	*At school, which foreign languages are you learning?*
Au collège, je **n**'apprends **que** …	*At school, I am only learning …*
En ce **moment**, j'apprends …, mais je n'apprends pas …	*At the moment, I am learning …, but I am not learning …*
Est-ce que tu aimes parler une autre langue?	*Do you like speaking another language?*
J'aime / Je n'aime pas apprendre…	*I like / don't like learning …*
À l'avenir, comment est-ce que tu vas améliorer ton français?	*In the future, how are you going to improve your French?*
À l'avenir, je vais …	*In the future, I'm going to …*
écouter des *podcasts.	*listen to podcasts.*
lire des *blogs en français.	*read blogs in French.*
regarder des films *sous-titrés.	*watch subtitled films.*
utiliser une appli sur mon portable.	*use an app on my mobile.*

Year 10 French Module 4: En plein forme (1).

Sain ou malsain?	*Healthy or unhealthy?*
Ce **plat** / Ce dessert **contient** …	*This dish / This dessert contains …*
Ces gâteaux **contiennent** …	*These cakes contain …*
du chocolat / fromage / riz	*chocolate / cheese / rice*
poisson / *poulet / sucre	*fish / chicken / sugar*
de la glace / *sauce / viande	*ice cream / sauce / meat*
des frites / fruits / légumes	*chips / fruit / vegetables*
À ton avis, le **plat**, c'est sain?	*In your opinion, is the dish healthy?*
C'est sain / malsain.	*It is healthy / unhealthy.*
C'est bon / mauvais pour la santé.	*It is good / bad for your health.*
Le **plat** a bon goût.	*The dish tastes good.*
Je n'aime pas le goût.	*I don't like the taste.*
C'est parfait pour les végétariens.	*It's perfect for vegetarians.*
Ce n'est pas bon pour les végans.	*It's not good for vegans.*
le goût	*the taste*
délicieux	*delicious*
végan/végane	*vegan*
végétarien/végétarienne	*vegetarian*
Allez plus souvent au centre sportif!	*Go to the sports centre more often!*
Faites de la natation une fois **par semaine**!	*Go swimming once a week!*
Mangez moins de frites et de chocolat!	*Eat fewer chips and less chocolate!*
Dormez au moins huit heures **par nuit**!	*Sleep at least eight hours per night!*
Essayez de faire plus d'exercice!	*Try to do more exercise!*
Allez au collège à pied ou à vélo!	*Go to school on foot or by bike!*

Bon appetit!	*Bon appetit!*
Qu'est-ce que tu manges (normalement)?	*What do you (usually) eat?*
Qu'est-ce que tu prends pour le petit-déjeuner?	*What do you have for breakfast?*
Qu'est-ce que tu manges et bois à midi?	*What do you eat and drink at lunchtime?*
Est-ce que tu manges quelque chose après les cours?	*Do you eat something after school?*
Normalement, le soir, qu'est-ce que tu manges?	*What do you usually eat in the evening?*
Pour le petit-déjeuner / À midi	*For breakfast / At lunchtime*
Après les cours	*After school*
Normalement, le soir, …	*Usually, in the evening, …*
je bois / je mange / je prends …	*I drink / I eat / I have …*
du café / pain / *poulet	*coffee / bread / chicken*
du poisson / *vin rouge	*fish / red wine*
du lait / *thé (à la *menthe)	*milk / (mint) tea*
du *bœuf / lait de *coco	*beef / coconut milk*
de la glace	*ice-ceam*
des fruits / légumes / œufs	*fruit / vegetables / eggs*
des *olives / pâtes	*olives / pasta*
de l'eau	*water*
un sandwich / un **verre** de lait	*a sandwich / a glass of milk*
Je mange souvent des œufs.	*I often eat eggs.*
Quand j'ai soif, je bois du thé.	*When I am thirsty, I drink tea.*
Hier, j'ai acheté du fromage au marché.	*Yesterday, I bought cheese at the market.*
J'en mange beaucoup, parce que c'est délicieux.	*I eat lots of it, because it's delicious.*
Toute ma famille mange de la viande, **sauf** ma mère.	*All my family eat meat, except my mother.*

Bien dans ma peau!	*Comfortable in my skin!*
Comment tu <u>te sens</u> (aujourd'hui)?	*How do you feel (today)?*
Comment ça va aujourd'hui?	*How are you today?*
Ça va très bien.	*I am very well.*
Ça ne va pas bien.	*I am not well/not good.*
Qu'est-ce qui ne va pas?	*What's wrong?*
Quel est le problème?	*What's the problem?*
Je **me sens** …	*I feel …*
Je suis …	*I am …*
un peu / assez / très / vraiment …	*a bit / quite / very / really …*
calme / en **colère**	*calm / angry*
*fatigué(e)	*tired*
heureux/heureuse	*happy*
inquiet/inquiète	*worried*
triste	*sad*
stressé(e)	*stressed*
Écoute un peu de musique.	*Listen to some music.*
Fais de la cuisine.	*Do some cooking.*
Parle avec moi.	*Speak to me.*
Sois calme / patient.	*Be calm / patient.*
Va au lit / à un cours de *yoga.	*Go to bed / to a yoga class.*
Va faire une petite *promenade.	*Go for a walk.*
Ne **crie** / pleure / **t'inquiète** pas.	*Don't shout / cry / worry.*
N'oublie pas tes devoirs.	*Don't forget your homework.*
Ne **sois** pas triste.	*Don't be sad.*
Tu dois parler avec quelqu'un.	*You must speak to someone.*
Tu dois **expliquer** le problème à …	*You have to explain the problem to …*
Essaye d'en parler avec …	*Try to speak about it with …*
Cherche en ligne.	*Search online.*
Tu dois **éviter** de passer trop de temps devant des **écrans**.	*You have to avoid spending too much time in front of screens.*
Ils peuvent te **conseiller**.	*They can advise you.*

Year 10 French Module 4: En plein forme (2).

Ça ne va pas?	*Are you not well?*
le corps **humain**	*the human body*
le bras / le cœur / le dos	*arm / heart / back*
le nez / le pied / le ventre	*nose / foot / stomach*
la bouche / la gorge / la jambe	*mouth / throat / leg*
la main / l'oreille / la tête	*hand / ear / head*
les yeux	*eyes*
*Allô? Je peux vous aider?	*Hello? Can I help you?*
Bonjour. Je voudrais prendre rendez-vous, s'il vous plaît.	*Hello. I would like to make an appointment, please.*
Bien sûr. Quel est le problème?	*Of course. What is the problem?*
J'ai très / vraiment mal au bras et mal à la main / tête.	*I have a very / really sore arm and a sore hand / headache.*
J'ai mal à l'oreille et j'ai de la **fièvre** aussi.	*I have an ear ache and I also have a fever.*
Vous voulez un rendez-vous pour quand?	*When would you like an appointment?*
Demain après-midi. / Aujourd'hui.	*Tomorrow afternoon. / Today.*
Mercredi, s'il vous plaît.	*Wednesday, please.*
Pas de problème.	*No problem.*
Le rendez-vous est à quelle heure, s'il vous plaît?	*What time is the appointment, please?*
C'est à deux / trois / dix heures.	*It is at two / three / ten o'clock.*
C'est à deux / trois / dix heures trente / et demie.	*It is at half past two / three / ten.*
Quelle est l'adresse, s'il vous plaît?	*What is the address, please?*
C'est dans la rue (du Marché),	*It is in (Market) Street,*
au numéro dix / quinze / vingt-cinq.	*at number ten / fifteen / twenty-five.*
Merci. Au revoir.	*Thank you. Goodbye.*
J'ai eu un accident.	*I had an accident.*
Je me suis *cassé le/la …	*I broke my …*
Ça s'est passé …	*It happened …*

Mieux vivre	*Live better*
Quand tu étais plus jeune, ta vie était comment?	*When you were younger, how was your life?*
Je suis né(e) en *Côte d'Ivoire / France.	*I was born in Côte d'Ivoire / France.*
Ma famille était *modeste.	*My family was modest.*
Quand j'étais jeune, …	*When I was young, …*
j'habitais …	I used to live…
je jouais au tennis / au basket.	*I played tennis / basketball.*
je travaillais dans un hôtel.	*I worked in a hotel.*
Maintenant, est-ce que ta vie est meilleure?	*Now, is your life better?*
Maintenant, …	*Now, …*
je suis *politicien(ne).	*I am a politician.*
Je suis acteur/actrice.	*I am an actor.*
j'écris des chansons / des *poèmes.	*I write songs / poems.*
je lutte pour les droits des travailleurs.	*I fight for the rights of workers.*
Qu'est-ce que tu <u>feras</u> à l'avenir?	*What will you do in the **future**?*
À l'avenir …	*In the future, …*
je **continuerai** à lutter pour la **justice** et l'égalité.	*I will continue to fight for justice and equality*
je **chanterai**.	*I will sing.*
je **jouerai** dans des films.	*I will act in films.*

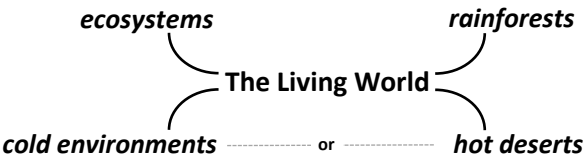
Je change ma vie.	*I am changing my life.*
À l'avenir, qu'est-ce que tu <u>feras</u>,	*In the future, what will you do*
pour améliorer ta vie?	*to improve your life?*
J'**achèterai** …	*I will buy …*
J'**aiderai** les autres / ma mère et mes grands-parents.	*I will help others / my mother and my grandparents.*
J'**aurai** …	*I will have …*
plus de *patience avec ma petite sœur.	*more patience with my little sister.*
une meilleure attitude à la maison.	*a better attitude at home.*
J'**écouterai** la prof quand elle parle.	*I will listen to the teacher when she is speaking.*
Je **ferai** plus d'exercice / de vélo.	*I will do more exercise / cycling.*
Je **ferai** plus d'efforts en maths.	*I will make more effort in maths.*
J'**irai** (plus souvent) au centre sportif / à des	*I will go (more often) to the sports centre / to*
cours de cuisine / à des cours de danse.	*cookery classes / to dance classes.*
J'**irai** à la piscine au moins deux fois **par semaine**.	*I will go to the swimming pool at least twice a week.*
Je **jouerai** au tennis.	*I will play tennis.*
Je **mangerai** mieux.	*I will eat better.*
Je **mangerai** …	*I will eat …*
moins de choses **sucrées** / chocolat.	*fewer sweet things / less chocolate.*
plus de fruits / légumes.	*more fruit / vegetables.*
Je **passerai** moins de temps sur les réseaux sociaux.	*I will spend less time on social media.*
Je **penserai** moins à moi.	*I will think less about myself.*
Je **serai** plus actif/active.	*I will be more active.*
Je **serai** plus *gentil(le) / sympa avec ma petite sœur / mon demi-frère.	*I will be kinder / nicer to my little sister /my half-brother.*
Je **travaillerai** plus sérieusement au collège.	*I will work harder at school.*
Je ne **ferai** pas mes devoirs à la dernière minute!	*I will not do my homework at the last minute!*
Je ne **parlerai** pas en même temps **que** la prof.	*I will not speak at the same time as the teacher.*
Pour / **Afin de/d'** …	*In order to …*
être plus en forme / moins *fatigué(e), …	*be in better shape / less tired, …*
réduire le *stress, …	*reduce stress, …*
*Au lieu de/d' …	*Instead of …*
choisir des frites / écrire des e-mails, …	*choosing chips / writing emails …*
Avant d'aller au lit, …	*Before going to bed, …*

THE LIVING WORLD
Ecosystems

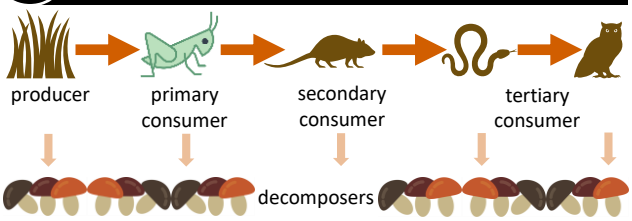
read

quiz

The Big Picture



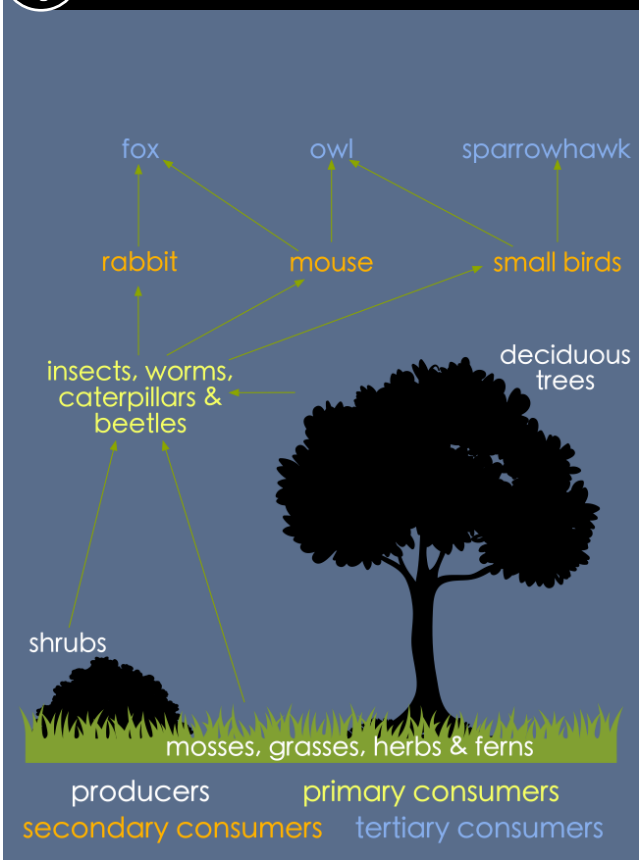
Food Chain



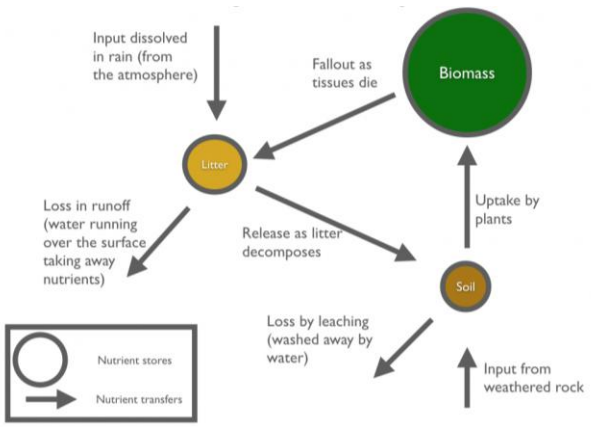
Key Terms

- ***Abiotic*** – The non-living elements of an ecosystem e.g. climate, soil and water.
- **Biotic** – Organisms found in an ecosystem e.g. plants, insects & animals.
- **Ecosystem** – a community of plants and animals sharing an environment with non-living things.
- **Producer** – A type of organism produce their own food usually by photosynthesis.
- **Consumer** – Organisms that consume other organisms to obtain their energy.
- **Decomposer** – Organisms that break down dead plants and animals.
- **Food chain** – The flow of energy from producer to tertiary consumer.
- **Food web** – A diagram showing lots of food chains and how they overlap.
- **Nutrient cycle** – The transfer of nutrients through an ecosystem.

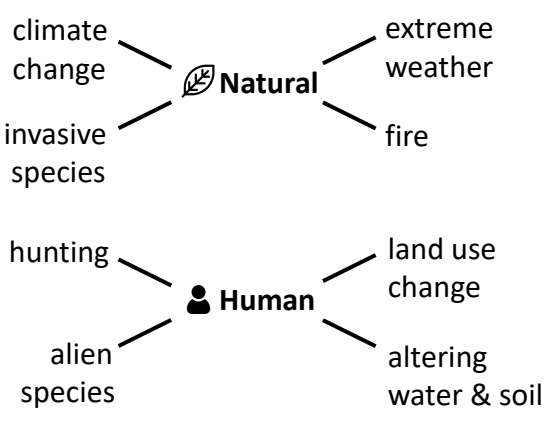
Food Web



The Nutrient Cycle



Ecosystem Change



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THE LIVING WORLD
Rainforests

quiz

The Big Picture

ecosystems — *rainforests**

The Living World

cold environments ---------- or ---------- *hot deserts*

Key Terms

Biome – Areas of the planet with a similar climate and landscape, where similar animals and plants live.

Biodiversity – The variety of life in the world or a particular habitat.

Commercial farming – Farming to sell produce for a profit.

Debt reduction – National debt relief in return for protecting rainforests.

Deforestation – The chopping down and removal of trees.

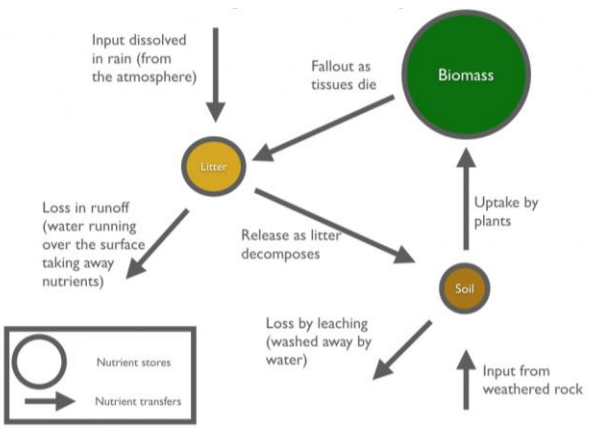
Ecotourism – Responsible travel to natural areas that conserves the environment and benefits locals.

Logging – Cutting down trees and selling the timber.

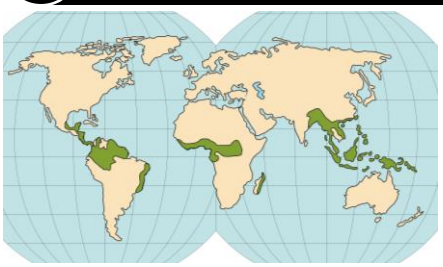
Soil erosion – Removal of topsoil faster than it can be replaced.

Sustainability – Progress meting todays needs with affecting future generations.

The Nutrient Cycle



Location



10°N and 10°S of the Equator

South America (Amazon), the DRC (Africa), Indonesia & Malaysia (Asia)

Characteristics

Climate - High temperatures (27°C) and high rainfall (2000mm +)

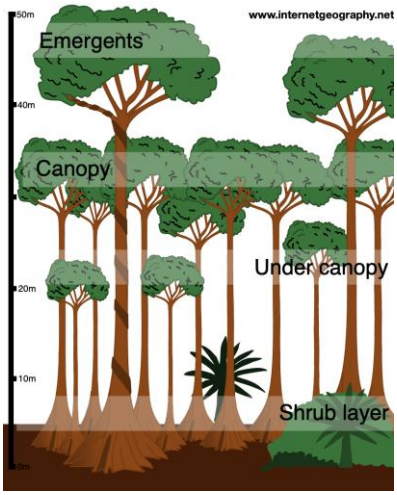
Water – Distinct wet season lasting several months. Leaching during this time.

Soil – Not very fertile. Nutrients concentrated in the topsoil & quickly absorbed.

Biotic – Highest biodiversity in the world. Thousands of species of plants and animals.

People – Traditional tribes live sustainably. Exploitation for $$ gain by non-indigenous.

Adaptations



Emergents and lianas grow to reach the sunlight.

Buttress roots anchor the trees in the shallow soil.

Smooth bark to deter epiphytes.

Plants have thick, waxy leaves & drip tips to channel water.

Poison Dart Frog - bright colours deter predators.

Sloths - long, sharp claws that help them cling onto branches.

Spider Monkey - prehensile tail to be able to grasp the branches of trees.

Jaguars - large claws, which enable them to climb small trees and catch their prey.

THE LIVING WORLD
Rainforests

read

quiz

The Big Picture

ecosystems — *rainforests**

The Living World

cold environments ---------- or ---------- *hot deserts*

Value

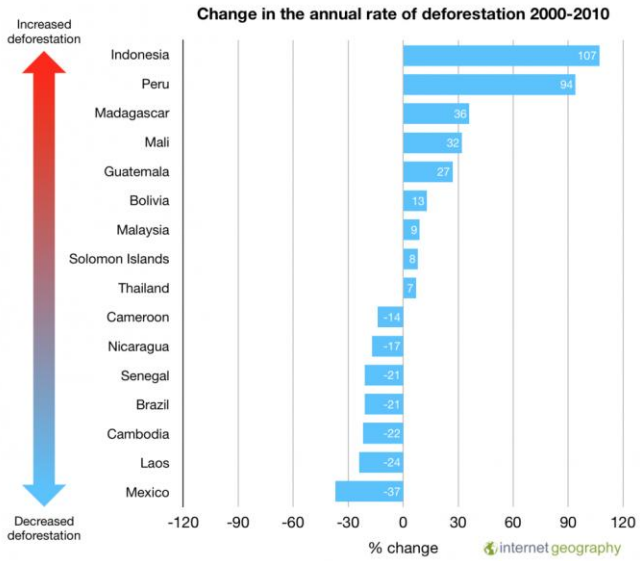
Services

- **Carbon sink**
- **Water and nutrient cycling**
- **Protection against soil erosion**
- **Wildlife habitats**
- **Biodiversity**
- **Employment opportunities**

Goods

- **Native food crops (fruit and nuts)**
- **Wild meat and fish**
- **Building materials (timber)**
- **Energy from hydro electric power**
- **Water**
- **Medicines**

Deforestation Rates



Causes of Deforestation

Logging – Hard wood (mahogany & teak) valued for furniture. Small trees pulped/charcoal.

Road building – Increased accessibility encourages development e.g. Trans-Amazonian.

Mineral extraction – Minerals (gold, bauxite, and copper) mined extensively.

Energy development – High rainfall creates ideal conditions for HEP.

Settlement and population growth – Settlements developed to service developments.

Impacts of Deforestation

Economic Development

- Commercial farming and mining generate employment and tax income
- Education, health care and social conditions are improved from tax revenue.
- Raw materials used by processing industries increasing the value of exported products.
- Cheap, renewable energy = development.
- Long-term economic losses due to forests being destroyed and rivers polluted.
- Loss of biodiversity affects tourism.

Soil Erosion

- Exposed land increases soil vulnerability to soil erosion reducing fertility.

Climate Change

- Local environment becomes hotter and drier.
- Reduction in carbon sink due to deforestation.
- Burning trees releases carbon dioxide.

Sustainable Management

International hardwood agreements

Ecotourism

debt reduction

Strategies

conservation and education

Selective logging and replanting

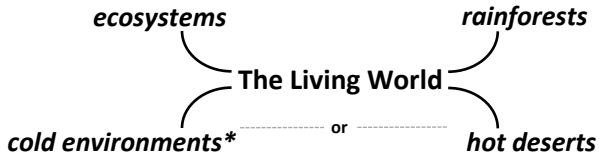
THE LIVING WORLD

Cold Environments

read

quiz

The Big Picture



Key Terms

Biodiversity – The variety of life in the world or a particular habitat.

Fragile environment – An environment that is both easily disturbed and difficult to restore if disturbed.

Infrastructure – Basic equipment and structures for a location to function.

Mineral extraction – The removal of solid mineral resources from the earth.

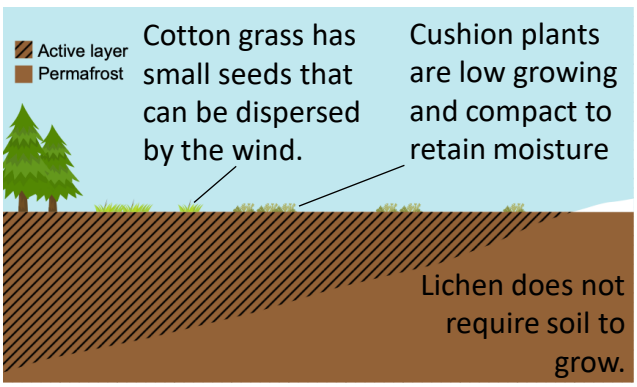
Permafrost – Permanently frozen ground.

Polar – Most extreme cold environment inc. Antarctica and much of Greenland.

Tundra – The flat, treeless Arctic regions where the ground is permanently frozen.

Wilderness area – A natural environment that has not been significantly modified by human activity.

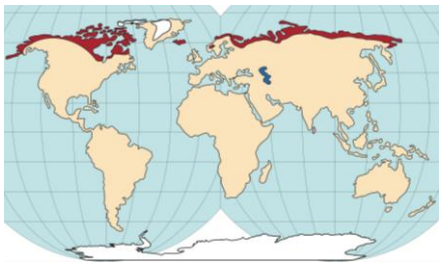
Adaptations



Arctic Foxes and Arctic Hares

- have thick fur on their bodies and feet to keep them warm
- in winter their fur becomes white providing camouflage from predators

Location



Polar – Antarctica and much of Greenland.

Tundra – Includes parts of Canada, Alaska, Northern Europe and Russia.

Characteristics

Climate – P = Temp below freezing all year and precipitation low. T = High temp range. Snowy winter, rain in summer. Dark winter.

Permafrost – T = active layer freezes in winter and thaws in summer. Permafrost below.

Soil – P = mainly bare rock. T = Thin and lack fertility. Waterlogged in summer. Depth and fertility increase from Poles.

Biotic – Low level of biodiversity. Food chain and webs are very basic. Adaptations required.

People – No permanent settlements in polar. Indigenous people live in tundra esp. near coast.

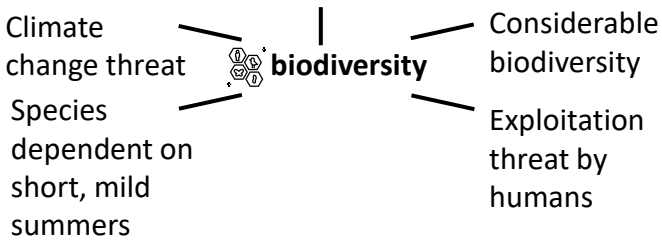
Interdependence

Interdependence includes:

- simple food webs
- sustainable coexistence of people, plants and animals in cold environments
- adaptations of plants and animals to soil and climate characteristics
- potential damage to the ecosystem inflicted by resource exploitation.

Biodiversity

Thousands of species of lichens, plants and insects.



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THE LIVING WORLD
Svalbard

quiz

The Big Picture

ecosystems — *rainforests*

The Living World

*cold environments** or *hot deserts*

Location

About

Svalbard is an archipelago (a large group of islands) located in northern Europe, halfway between Norway and the North Pole. It is one of the world's northernmost inhabited areas and is administered by Norway. It has a permanent population of 2700, of which 2300 live in Longyearbyen, the administrative centre of the islands.

Opportunities

Mineral resources – Svalbard has a significant amount of coal and coal mining is the main economic activity on the islands, once employing over 300 people.

Energy – A coal-fired power station meets Svalbard's energy needs. This and the need to fly frequently results in Svalbard residents having Europe's highest carbon footprint.

Tourism – Svalbard is a popular tourist destination and is visited regularly by cruise ships. Some 70,000 tourists visited in 2011, of which 30,000 arrived on cruise ships.

Fishing – The Barents Sea that surrounds Svalbard is home to some of the best fishing grounds in the world. Fishing is controlled, which means it is sustainable.

Challenges

Buildings and infrastructure – Permafrost is difficult to build on. Roads are constructed on gravel beds so the permafrost does not thaw. Raised, insulated utility pipes protect services.

Inaccessibility – Svalbard is a very remote region, relying on transport such as planes and ships for access. Locals rely on snowmobiles and 4x4s in the winter.

Temperature – Winter temperatures can drop below -30°C in Svalbard. This, along with limited sunlight in the winter, makes working outside very challenging. In the winter the sea freezes and roads become very dangerous.

Key Terms

Ecotourism – Travel that conserves the environment and benefits locals.

Inaccessibility – Very difficult to travel or impossible to travel to or reach.

Infrastructure – Basic equipment and structures for a location to function.

Non-renewable energy – Energy from sources that will run out e.g. oil.

Permafrost – Land that is permanently frozen.

Sparsely populated – Few people live in an area.

THE LIVING WORLD

read

Protecting Cold Environments

quiz

The Big Picture

ecosystems — ***rainforests***

The Living World

cold environments* — **or** — ***hot deserts***

What is a wilderness area?

Wilderness areas are remote, unspoilt parts of the world including deserts, mountains and cold environments. Wilderness areas are typically unspoilt by human development and remain natural. Many of the world's cold environments are considered wilderness areas due to their remoteness and physical conditions.

Protecting wilderness areas

Cold environments need to be protected for a range of reasons, including:

- Tundra and polar environments are fragile environments. Recovery from human impact can take significant time.
- Indigenous culture depends on the preservation of the natural environment.
- Cold environments are home to a range of species, many are unique.
- There is a global moral responsibility to protect wilderness areas.
- Scientists need to study global processes in unspoilt areas e.g. climate change.

Strategies to maintain cold environments

Stilts raise the insulated Trans-Alaskan oil pipeline above the ground to reduce the risk of thawing permafrost and disrupting animal migration.

Pumping stations enable the oil to flow over mountainous areas in the region.

Only allows the use of Antarctica for peaceful purposes, and military activities are forbidden.

Promotes co-operation among international scientists.

Strict controls on tourism and landing sites to reduce the impact of tourists.

Technology can provide environmentally friendly solutions to some of the challenges faced by developing cold environments.

Antarctica is often described as 'the last wilderness on Earth'. It has remained undeveloped since the 1959 Antarctic Treaty.

Technology — **International Agreements**

Maintaining Cold Environments

Action by Governments — **Conservation Groups**

Since oil was found in Alaska in the 1960s, the US government has been involved in protecting the environment.

Conservation groups (e.g. WWF), work with governments, communities and businesses to protect Arctic biodiversity.

Alaska's marine habitats and fishing have been monitored by the National Oceanographic and Atmospheric Administration (NOAA).

The Western Arctic Reserve has been set up in the north of Alaska, protecting the area from oil and gas extraction.

The WWF Arctic Programme was launched in 1992 to work with governments on issues such as climate change, polar bears, shipping and oil and gas including project such as:

- *Scientific research into endangered species*
- *Promoting sustainable development*
- *Monitoring and protecting ecosystems*

Year 10 German Module 1: Zurück zur Schule (1).

Schulsachen	*School things*
Ich habe … gekauft	*I bought …*
Ich habe …	*I have …*
Ich brauche …	*I need …*
einen Computer	*a computer*
einen Kuli	*a pen*
eine Schultasche	*a school bag*
eine Wasserflasche	*a water bottle*
ein Buch	*a textbook/book*
ein Heft	*an exercise book*

Schulfächer	*School subjects*
Was hast du (am Montag) *in* der (ersten/zweiten/dritten) Stunde?	*What do you have (on Monday) in the (first/second/third) lesson?*
Am (Montag) in der (ersten) Stunde habe ich…	*On (Monday) my (first) lesson is …*
*Biologie	*biology*
* Chemie	*chemistry*
Deutsch	*German*
*Englisch	*English*
*Erdkunde	*geography*
*Französisch	*French*
Geschichte	*history*
*Informatik	*computing*
Kunst	*art*
Mathe	*maths*
Musik	*music*
*Physik	*physics*
Religion	*religious education*
*Spanisch	*Spanish*
Sport	*sport*
Sprachen	*languages*
Theater	*theatre/drama*
(Natur)wissenschaften	*(natural) sciences*

Tage	*Days*
Montag	*Monday*
Dienstag	*Tuesday*
Mittwoch	*Wednesday*
Donnerstag	*Thursday*
Freitag	*Friday*
Wie oft hast du (Mathe)?	*How often do you have (maths)?*
Ich habe (Mathe) (einmal/ zweimal/dreimal) pro Woche / pro Tag.	*I have (maths) (once/twice/ three times) a week / a day.*
Wie viele Stunden hast du (am Nachmittag / nach der Pause)?	*How many lessons do you have (in the afternoon / after the break)?*
Was ist dein Lieblingsfach?	*What is your favourite subject?*
Mein Lieblingsfach ist (Deutsch).	*My favourite subject is (German).*
Wann hast du (am Dienstag) (Englisch)?	*When do you have (English) (on Tuesday)?*

Fragen	*Questions*
Wann …?	*When …?*
Was …?	*What …?*
Wie …?	*How …?*
Wie viel(e) …?	*How much / how many …?*
Wie oft …?	*How often …?*
Warum …?	*Why …?*
Welche/r/s …?	*Which …?*
Welches Fach magst du (nicht) und warum?	*Which subject do you (not) like and why?*
Wie findest du …?	*What do you think about …?*
Ich mag … (nicht), weil es …ist.	*I (don't) like … because it is …*
Ich liebe … weil ich es … finde.	*I love … because I find it …*
einfach	*easy*
ermüdend	*tiring*
interessant	*interesting*
kompliziert	*complicated*
langweilig	*boring*
leicht	*easy*
nützlich	*useful*
praktisch	*practical*
schwer	*difficult/hard/tough*
schwierig	*difficult/hard/tough*
wichtig	*important*
… weil ich schwach (in Musik) bin.	*because I'm weak at (music).*
… weil ich sportlich bin.	*because I'm sporty.*
… weil ich Sprachen liebe.	*because I love languages.*
In der Pause …	*At break …*
spreche ich mit meinen Freunden/Freundinnen.	*I talk to my friends.*
esse ich …	*I eat …*
trinke ich …	*I drink …*
spiele ich …	*I play …*

Schultage: die beste Zeit deines Lebens?	*School days: the best time of your life?*
Ich habe / Wir haben …	*I/We …*
gegessen	*ate*
gespielt	*played*
gemacht	*did*
gezeigt	*showed*
gehört	*heard/listened*
gekauft	*bought*
geschlafen	*slept*
Ich bin / Wir sind …	*I/We …*
gegangen	*went*
gefahren	*drove/travelled*
geflogen	*flew*
gekommen	*came*
geschwommen	*swam*
geblieben	*stayed*
Ich war / Wir waren	*I was / We were*
Ich hatte / Wir hatten	*I had / We had*
Es gab	*There was / were*

Year 10 German Module 1: Zurück zur Schule (2).

Schuluniform	*School uniform*
Was trägst du in der Schule?	*What do you wear to school?*
Ich trage …	*I wear …*
einen Pullover	*a sweater*
*einen Rock	*a skirt*
eine Hose	*trousers*
eine Jacke	*a jacket*
(eine) Jeans	*(a pair of) jeans*
eine Krawatte	*a tie*
eine Schuluniform	*a school uniform*
ein Hemd	*a shirt*
ein Kleid	*a dress*
ein T-Shirt	*a t-shirt*
Schuhe	*shoes*
Shorts	*shorts*
Sportschuhe	*trainers*
Farben	*Colours*
blau	*blue*
braun	*brown*
dunkelblau	*dark blue*
gelb	*yellow*
grau	*grey*
grün	*green*
hellblau	*light blue*
*lila	*purple*
orange	*orange*
rosa (rosarot)	*pink*
rot	*red*
schwarz	*black*
weiß	*white*
Wie findest du Schuluniformen?	*What do think of school uniforms?*
Ich finde (Schuluniformen) …	*I find (school uniforms) …*
(sehr) praktisch	*(very) practical*
Auf der anderen Seite sind sie	*On the other hand they are*
langweilig	*boring*
teuer	*expensive*
unbequem	*uncomfortable*
Was sieht man auf dem Foto?	*What can you see on the photo?*
Auf dem Foto sieht man (drei) Jugendliche:	*On the photo you can see (three) young people*
(zwei) Jungen und ein Mädchen.	*(two) boys and a girl.*
Sie sind ungefähr (15) Jahre alt.	*They are about (15).*
Es sind Schüler und Schülerinnen	*They are students/pupils*
, weil sie eine Schuluniform tragen.	*because they are wearing school uniforms.*
Der Junge im Vordergrund trägt …	*The boy in the foreground is wearing …*
Die Jungen tragen…	*The boys are wearing …*
Das Mädchen im Hintergrund trägt …	*The girl in the background is wearing …*
Die Mädchen tragen …	*The girls are wearing …*
Sie sind (in einem Park) (**draußen**) und sie (sprechen miteinander).	*They are (in a park) (outside) and they (are talking to each other).*
Der Vorteil/Nachteil ist …	*The advantage/ disadvantage is*

Schulregeln und Meinungen	*School rules and opinions*
Man muss …	*You have to / must …*
Man soll …	*You should/ought to …*
Man darf …	*You are allowed to …*
Man darf … nicht	*You must not …*
im Klassenzimmer	*in the classroom*
im Computerraum	*in the computer room*
im Gang	*in the corridor*
im Unterricht	*during lessons*
in der Bibliothek	*in the library*
in der Schule	*at school*
draußen	*outside*
ruhig sein	*be quiet*
leise sein	*be quiet*
laufen	*run*
langsam gehen	*walk slowly*
plaudern	*chat*
eine Uniform tragen	*wear a uniform*
Respekt zeigen	*show respect*
seine Hausaufgaben vergessen	*forget your homework*
Ich denke, dass	*I think*
Ich glaube, dass	*I believe*
Ich bin der Meinung, dass …	*I am of the opinion that …*
...es / diese Regel...	*it/this rule (is)*
(un)fair	*(un)fair*
falsch	*wrong*
notwendig/nötig	*necessary*
(nicht) praktisch	*(not) practical*
richtig	*right*
wichtig	*important*
weil ich nicht genug Freizeit habe.	*Because I don't have enough free time.*
weil es in der *Kantine nicht genug Platz gibt.	*Because there isn't enough room in the canteen.*

Der Schultag	*The school day*
Was machst du normalerweise in der (Mittags)pause?	*What do you normally do at lunch?*
In der Mittagspause …	*In my lunch break …*
esse ich (normalerweise) mein Pausenbrot / in der *Kantine.	*I (normally) eat my snack / in the canteen.*
plaudere ich mit meinen Freunden.	*I chat with my friends.*
verbringe ich Zeit mit Freunden.	*I spend time with friends.*
mache ich Sport / meine Hausaufgaben.	*I do sports / my homework.*
gehe ich in einen Klub / in die *Kantine.	*I go to a club / to the canteen.*
Ich habe keine (Mittags)pause.	*I don't have a (lunch) break.*
Was hast du gestern in der Mittagspause gemacht?	*What did you do in your lunch break yesterday?*
Gestern in der (Mittags)pause habe ich …	*Yesterday at lunch I…*
Was hast du gestern nach der Schule gemacht	*What did you do after school yesterday?*
Gestern nach der Schule habe ich…	*After school I …*
mit meinen Freunden **geplaudert**	*chatted with friends*
Zeit mit Freunden verbracht	*spent time with friends*
Sport gemacht	*did sports*
bin ich in die Stadt gegangen.	*I went into town.*
Wir haben jeden Tag … Stunden und … Pausen.	*Every day we have … lessons and breaks.*
In der Schule lerne ich…	*At school I'm learning…*
Letztes Jahr hatten wir …	*Last year we had …*
Es war …, weil …	*It was … because …*

Year 10 German Module 4: Bleib gesund (1).

Gesundheit und Fitness	*Health and fitness*
Ich …	*I …*
treibe … Sport.	*do sport …*
spiele … (Fußball/Tennis/Handball).	*play (football/tennis/ handball) …*
mache … (Leichtathletik).	*do (athletics, track and field) …*
fahre … (Rad/Ski).	*ride (a bike/ski) …*
gehe … (laufen/schwimmen/wandern).	*go (running/swimming/hiking) …*
regelmäßig	*regularly*
häufig	*frequently*
ab und zu	*now and again*
selten	*rarely*
Mein Lieblingssport ist …, aber	*My favourite sport is …, but I also*
ich … auch gern …	*like …*
Ich … nicht gern …, weil …	*I don't like …, because …*
Im Sommer/Winter … ich lieber / **am liebsten** …	*In summer / winter I prefer / like … the best.*
das Schwimmbad	*swimming pool*
das *Freibad	*outdoor swimming pool*
das *Hallenbad	*indoor swimming pool*

Essen und Trinken	*Eating and drinking*
der **Löffel**	*spoon*
der **Teller**	*plate*
die Flasche	*bottle*
die **Gabel**	*fork*
das Glas	*glass*
das **Messer**	*knife*
Mein Glas / Der **Teller** ist schmutzig.	*My glass / The plate is dirty.*
Ich habe (keinen **Löffel** / keine **Gabel** / kein **Messer**).	*I don't have a (spoon/fork/knife).*
Können Sie mir bitte (einen **Löffel**) bringen?	*Can you bring me (a spoon), please?*
Kann ich bitte ein sauberes **Messer** haben?	*Can I have a clean knife, please?*
Das **Messer** ist (schmutzig / nicht scharf).	*The knife is (dirty / not sharp).*
Das Essen ist (zu heiß / zu kalt).	*The food is (too hot / too cold).*
Wo ist die Toilette?	*Where is the toilet?*
Kann ich … haben?	*Can I have …?*
ein Glas	*a glass*
eine Flasche Wasser	*a bottle of water*
die Rechnung	*the bill*
Kann ich bitte bezahlen?	*Can I have the bill, please?*
Ich möchte mit Karte zahlen.	*I would like to pay by card.*

Unfälle und Krankheiten	*Accidents and illnesses*
der Arm	*arm*
der Bauch	*stomach, belly*
der Finger	*finger*
der Fuß	*foot*
der Hals	*neck, throat*
der Kopf	*head*
der Mund	*mouth*
der Rücken	*back*
der Zahn	*tooth*
die Hand	*hand*
die **Haut**	*skin*
die Nase	*nose*
die Schulter	*shoulder*
das Auge	*eye*
das Bein	*leg*
das Gesicht	*face*
das **Herz**	*heart*
das Knie	*knee*
das Ohr	*ear*
Ich habe mir (die Nase) gebrochen/**verletzt.**	*I have broken/injured (my nose).*
Meine Hand tut weh. / Meine Beine **tun** weh.	*My hand hurts. / My legs hurt.*
Seit wann haben Sie / hast du das?	*How long have you had it?*
Seit gestern.	*Since yesterday.*
Seit drei Tagen.	*For three days.*
Seit einer Woche.	*For a week.*
Wann ist das passiert?	*When did it happen?*
Gestern.	*Yesterday.*
Vor zwei Tagen / Vor einer Woche.	*Two days ago / A week ago.*
Wie ist das passiert?	*How did it happen?*
Beim Laufen.	*While running.*
Ich bin schwimmen gegangen.	*I went swimming.*
Sie müssen / Du musst …	*You have to / must …*
viel Wasser trinken.	*drink a lot of water.*
im Bett bleiben.	*stay in bed.*
ins Krankenhaus gehen.	*go to the hospital.*
zum Zahnarzt gehen.	*go to the dentist.*
Wie geht es dir?	*How are you?*
Was ist *los?	*What's the matter?*
Was tut dir/Ihnen weh?	*What hurts?*
Was hast du?	*What's the matter?*
Ich habe (Zahn)schmerzen.	*I have (tooth)ache.*
Ich habe (Bauch)weh.	*I have (stomach)ache.*
Mein Ohr tut weh.	*My ear hurts.*
Meine Augen **tun** weh.	*My eyes hurt.*
Können Sie / Kannst du mir bitte helfen?	*Can you help me, please?*
Wo tut es denn weh?	*Where does it hurt?*
Ich habe …schmerzen/…weh.	*I have … ache.*
Sie müssen / Du musst …	*You have to / must …*
dreimal täglich	*three times a day*
alle vier Stunden …	*every four hours*
dieses **Arzneimittel** / diese Medizin /eine *Tablette nehmen.	*take this medicine / a tablet.*
Wann kann ich wieder Fußball spielen?	*When can I play football again?*
Wann kann ich wieder in die Schule gehen?	*When can I go back to school?*
Morgen / In zwei Tagen / Nächste Woche.	*Tomorrow / In two days / Next week.*

Year 10 German Module 4: Bleib gesund (2).

Probleme und Lösungen	*Problems and solutions*
ändern	*change, alter*
aufgeben	*give up*
essen	*eat*
(sich) fühlen	*feel*
gehen	*go, walk*
hoffen	*hope*
laufen	*run*
lösen	*solve*
planen	*plan*
reduzieren	*reduce*
schlafen	*sleep*
schwimmen	*swim*
verbringen	*spend (time)*
versuchen	*try*
werden	*become*
der Bildschirm	*screen, monitor*
der Freund	*friend, ally, boyfriend*
die Freundin	*female friend, girlfriend*
die *Portion	*portion, helping, serving*
die Schule	*school*
die Woche	*week*
die Zeit	*time*
das Bett	*bed*
das Fitnesszentrum	*gym*
das Gemüse	*vegetable*
das Handy	*mobile phone*
das Obst	*fruit*
das Problem	*problem*
das Stück	*piece*

Das Wohlbefinden	*Wellbeing*
Wenn ich … **hätte, würde** ich …	*If I had …, I would …*
Wenn ich … **wäre, würde** ich …	*If I were …, I would …*
mehr Sport **treiben**.	*do more sport.*
ein Instrument lernen.	*learn (to play) an instrument.*
öfter ins Kino gehen.	*go to the cinema more often.*
mit meinen Eltern (**darüber**) sprechen.	*talk to my parents (about it).*
besser schlafen.	*sleep better.*
weniger gestresst sein.	*be less stressed.*
mich besser konzentrieren können.	*be able to concentrate better.*
glücklicher sein.	*be happier.*
mich besser **fühlen**.	*feel better.*
mehr Energie haben.	*have more energy.*
spazieren gehen.	*go for a walk/stroll.*

Das Wichtigste im Leben	*The most important thing in life*
Für mich ist/sind … sehr wichtig / das **Wichtigste**.	*For me … is/are very important / the most important.*
(die) Gesundheit	*health*
(die) Freizeit	*free time*
(die) Karriere	*career*
persönliche **Werte**	*personal values*
Beziehungen	*relationships*
Neulich habe ich …	*Recently I have …*
beschlossen, …	*decided …*
mich entschieden, …	*decided …*
versucht, …	*tried …*
In der Zukunft **habe** ich **vor,** … / plane ich, …	*In the future I intend / plan to …*
gesünder zu essen.	*eat more healthily.*
öfter Sport zu machen.	*do sport more often.*
früher ins Bett zu gehen.	*go to bed earlier.*
Ich hoffe, …	*I hope …*
mehr Energie zu haben.	*to have more energy.*
mehr Zeit mit meiner Familie zu verbringen.	*to spend more time with my family.*
weniger Stress im Leben zu haben.	*to have less stress in my life.*

History

Knowledge Organiser – Topic Four: Medicine in modern Britain, 1900-Present

Modern Britain	
1	From 1900-Present, there have been massive changes in medicine and treatment
Key events	
2	**1900** – life expectancy was still below 50 years of age
3	**1911** – National Insurance Bill introduced – gave help if workers were sick or unemployed
4	**1914-1918** World War One leads to developments in surgery and treatment
5	**1928** – Fleming discovered penicillin
6	**1938** – Florey and Chain developed use of penicillin
7	**1948** – The NHS begins following the Beveridge report (1942)
8	**1953** – Crick and Watson discovered the structure of DNA
Key Concepts	
9	**War** – World War One and World War Two forced developments in treatment and surgery – e.g. plastic surgery and the use of antibiotics in WW2.
10	**Technology** – huge improvements in technology greatly improved the understanding and treatment of disease – e.g. X-ray, DNA, Pacemakers, dialysis and keyhole surgery
11	**National Health Service** - After WW2, the government introduced the NHS in 1948. This offered free healthcare at the point of delivery. The expansion of who could vote and the shared experience of suffering in WW2 bought about this development.

Key Words		
12	**X-Ray**	Technology using particular light rays. Used in WW1 to locate bullets in the body.
13	**Transplant**	When a faulty or damaged organ (e.g. liver) is swapped with a healthy one through surgery
14	**Radiotheraphy /Chemotherapy**	Treatment of a disease, such as cancer, by the use of chemicals
15	**Superbugs**	Bacteria that are not affected/destroyed by antibiotics or cleaning
16	**Gene therapy**	Medical treatment using normal genes to replace defective ones.
17	**Dialysis**	Technology that replicates the function of the kidneys
18	**Polio**	A contagious disease that can cause paralysis and death
19	**Penicillin**	The first antibiotic drug produced from the mould of penicillin to treat infections
20	**Pacemaker**	Implanted technology that regulates heartbeat
21	**Antibiotics**	A drug made from bacteria that kill other bacteria and so cure an infection or illness
22	**Magic bullets**	A chemical that kills a particular bacterium and nothing else
23	**Electron microscope**	Developed 1931. Allows doctors to see cells in fine detail.
24	**DNA**	Deoxyribonucleic acid, the molecule that genes are made of
25	**Cancer**	A group of related diseases. Cells divide and spread into the surrounding tissue.

Knowledge Organiser Elizabeth Topic 1: Queen, Government and Religion 1558-69
There was much religious change under the Tudors and Elizabeth had to find a way of dealing with these issues. Many people objected to Elizabeth's coronation in 1558, and she faced questions over her legitimacy, with many preferring Mary Queen of Scots, and whether a woman could rule effectively.
Key events

History

1	**1532** Start of the English Reformation.
2	**1556-58** Dutch Revolt against Spanish.
3	**1558** Elizabeth's becomes queen.
4	**1559** Mary Queen of Scots became queen of France.
5	**1559** Treaty of Cateau-Cambresis – England had to return Calais to France. – financial loss, England looks weak.
6	**1559** Religious Settlement.
7	**1556** Pope issued an instruction that English Catholics should not attend Church of England services.
8	**1560** Elizabeth helped Scotland Protestant lords defeat Mary of Guise. Treaty of Edinburgh (Elizabeth tries to get Mary, Queen of Scots, to give up her claim as heir to the English throne).
9	**1562** Religious war in France.
10	**1563** Philip II banned import of English cloth into Netherlands.
11	**1567** Elizabeth allows Dutch Sea Beggars (they were fighting the Dutch) to shelter in English harbours.
12	**1568** Genoese Loan (a loan taken by Phillip II of Spain to fight his war against the Dutch – seized by Elizabeth).
13	**1568** Mary Queen of Scots fled from Scotland and arrives in England.
14	**1569** Revolt of the Northern Earls (uprising, either due to religion or power.... either way, they intended to remove Elizabeth from power). **A serious threat.**
Key Concepts	
1	**Society and Government** was very structured and hierarchical. The monarch had much power.
2	**Elizabeth's accession** caused controversy as her gender, legitimacy (right to rule) and religion were questioned.
3	**Religion** – Elizabeth imposed her Religious Settlement, but this upset many English and foreign Catholics, and some wanted Mary Queen of Scots to replace Elizabeth.
4	**Financial problems** – When Elizabeth took the throne the Crown was £300,000 in debt.
5	**Foreign powers** opposed to Protestantism remained an issue for Elizabeth, especially Scotland, France and Spain.

History

Knowledge Organiser Topic 2: Challenges to Elizabeth at Home and Abroad 1569-88	
1	Elizabeth faced many serious threats both within England and from aboard. Many still wanted Mary Queen of Scots on the throne. Philip II of Spain also wanted to remove Elizabeth from the throne. Spain and England were religious and political rivals. There was particular tension when Drake tried to challenge Spanish dominance in the New World.
Key events	
2	1492 Discovery of the New World
3	1567 Spanish travel to Netherlands to crush Protestant revolt.
4	1568 Mary Queen of Sots arrives in England
5	1569 Revolt of the Northern Earls
6	1570 Elizabeth excommunicated
7	1571 The Ridolfi Plot
8	1572 Elizabeth hired Drake as a privateer
9	1576 Spanish Fury and Pacification of Ghent
10	1577-80 Drake circumnavigated the globe.
11	1583 Throckmorton Plot
12	1584 Treaty of Joinville
13	1585 Act of Preservation of the Queen's Safety/Treaty of Nonsuch
14	1586 Babington Plot
15	1587 Mary Queen of Scots executed
16	1587 Attack on Cadiz
17	1588 Spanish Armada

Key Words and people.		
18	**New World**	North and South America.
19	**Revolt of the Northern Earls**	When northern earls encouraged Catholics to rebel.
20	**Mary Queen of Scots**	Supported the plan to marry the Duke of Norfolk.
21	**Thomas Howard, Duke of Norfolk**	One of England's most senior nobles and a Protestant.
22	**Charles Neville, Earl of Westmorland**	Duke of Norfolk's brother-in-law and from an important Catholic family.
23	**Thomas Percy, Earl of Northumberland**	Had been important under previous monarchs, but as a Catholic he had been side-lined.
24	**Civil War**	A war between people in the same country.
25	**Conspiracy**	A secret plan with the aim of doing something illegal.
26	**Papal Bull**	A written order by the Pope.
27	**Council of the North**	Used to implement Elizabeth's laws and authority in the North of England.
28	**Ridolfi Plot**	Plan to murder Elizabeth, launch a Spanish attack and put Mary Queen of Scots on the throne.
29	**Throckmorton Plot**	Planned for the French Duke of Guise to invade England, free Mary, overthrow Elizabeth and restore Catholicism in England.
30	**Babington Plot**	The Duke of Guise (France) would invade England and put Mary on the throne.

History

Key Words and people		
31	**Sir Francis Walsingham**	Elizabeth's Secretary of State.
32	**Act of Preservation of the Queen's Safety**	In the event of Elizabeth's assassination, Mary would be banned from the succession.
33	**Foreign Policy**	The aims of objectives that guide a nation's relations with other states.
34	**Privateer**	Individuals with their own armed ships that capture other ships for their cargo, often with the support and authorisation of the government.
35	**Francis Drake**	Elizabeth hired him as a privateer.
36	**Circumnavigate**	To travel all the way around the world.
37	**Spanish Fury**	The Spanish rampaged through Dutch provinces as they left.
38	**Pacification of Ghent**	Spanish troops expelled from Netherlands, political autonomy to be returned and end of religious persecution.
39	**Mercenary**	A soldier who fights for money rather than a nation or a cause.
40	**Treaty of Joinville**	The King of France and the King of Spain became allies against Protestantism.
41	**Treaty of Nonsuch**	Effectively put England and Spain at war.
42	**Singeing of the King of Spain's beard**	Drake sailed into Cadiz harbour, Spain's most important Atlantic port, and over 3 days destroyed 30 ships.
43	**Tilbury Speech**	Elizabeth's famous speech to her troops before the Armada.
Key Concepts		
44	**Anglo-Spanish relations** are tense due to the situation in the Netherlands, the execution of Mary Queen of Scots and Philip's decision to send the Armada in 1588.	
45	**Religion** continues to pose problems for Elizabeth as internal and external Catholics want her removed.	
46	**The New World** brought untold riches to Spain and Elizabeth wanted some of this for England. Drake can be seen as a hero or a villain.	

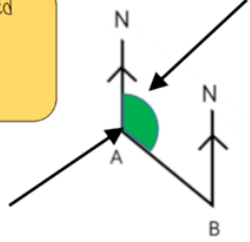
Maths: 10.05B Angles and bearings.....

Key words	
Cardinal directions	the directions of North, South, East, West
Angle	the amount of tum between two lines around their common point
Bearing	the angle in degrees measured clockwise from North
Perpendicular	where two lines meet at 90°
Parallel	straight lines always the same distance apart and never touch. They have the same gradient
Clockwise	moving in the direction of the hands on a clock
Construct	to draw accurately using a compass, protractor and or ruler or straight edge
Scale	the ratio of the length of a drawing to the length of the real thing
Protractor	an instrument used in measuring or drawing angles

Sparx codes for this topic	
M331, M780, U447	Measure & draw angles
M112	Scale drawings
M910	Directions
M416	Understand and represent bearings
M260	Measure and read bearings
U107	Bearings with angles

Understand and represent bearings

- A bearing is always measured from **NORTH**
- It is always given as three figures



The angle indicated starts from the North line at A and joins the path connecting A to B.

This angle shows the bearing of B from A

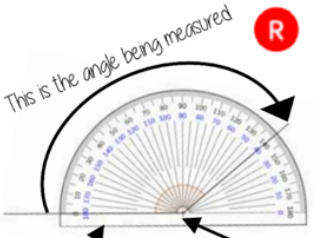
The bearing of B from A is calculated by measuring the highlighted angle

The sentence... "Bearing of ____ from _____" is really important in identifying the bearing being represented

Using **estimation** it is clear this angle is between 090° and 180°

Measure angles to 180°

R



The base line follows the line segment

Make sure the cross is at the point the two lines meet

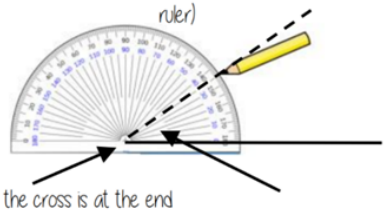
Read from 0° on the base line
Remember to use estimation. This is an obtuse angle so between 90 ° and 180 °

Draw angles up to 180°

R

Draw a 35° angle

Make a mark at 35° with a pencil and join to the angle point (use a ruler)



Make sure the cross is at the end of the line (where you want the angle)

The angle

Scale drawings

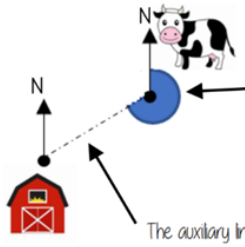
R

1 : 20

For every 1cm on the model there are 20cm in real life

Remember: Scale drawings ONLY change lengths and distances. Angles remain the same

Measure and read bearings



The bearing of the cow to the barn

This angle is measured from **NORTH**
It is measured in a clockwise direction
Estimation indicates this angle is between 180° and 270°
Use a protractor to measure accurately
Remember: bearings are written as three figures

The auxiliary line is drawn to help you measure and draw the angle that is measured to represent the bearing

Scale drawings using bearings

Remember – angles **DO NOT** change size in scaled drawings

The bearing measurements do not change from "real life" to images

The units in the ratio scale are the same

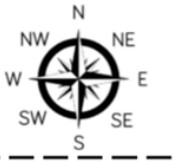
6cm = 30km
6:3,000,000

The scale may need to be calculated from the image
This represents 30km from P to Q

Directions

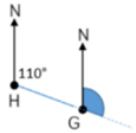
Clockwise

Anti-Clockwise

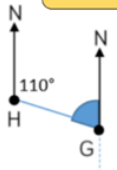


Bearings with angle rules

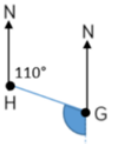
Because two North lines are **PARALLEL**....



They form **corresponding** angles and therefore are the same size



They form **co-interior** angles and add up to 180°

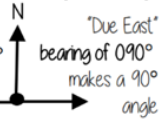


They form **alternate** angles and therefore are the same size

Bearings with right-angled geometry

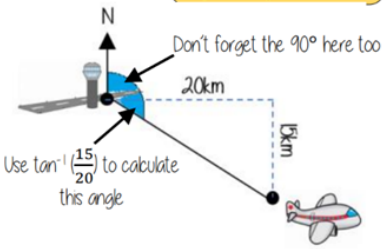
Look for Right-angles:
Pythagoras
Trigonometry (Sin, Cos, Tan)

"Due West" bearing of 270° makes a 90° angle



"Due East" bearing of 090° makes a 90° angle

A plane flies East for 20km then turns South for 15km. Find the bearing of the plane from where it took off.

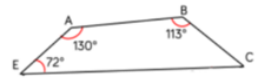


Use $\tan^{-1}\left(\frac{15}{20}\right)$ to calculate this angle

Angle notation

R

The letter in the middle is the angle
The arc represents the part of the angle



Angle Notation: three letters $A\hat{B}C$ This is the angle at B = 113 °

$\angle ABC$ is also used to represent the angle at B

Maths: 10.06 Working with circles.....

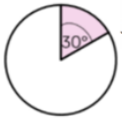
Key words	
Circumference	the length around the outside of the circle - the perimeter Area: the size of the 2D surface
Diameter	the distance from one side of a circle to another through the centre
Radius	the distance from the centre to the circumference of the circle
Tangent	a straight line that touches the circumference of a circle
Chord	a line segment connecting two points on the curve Frustrum: a pyramid or cone with the top cut off
Hemisphere	half a sphere
Surface area	the total area of the surface of a 3D shape

Sparx codes for this topic	
U767	Parts of a circle
M231, U950	Fractional parts of a circle
U221	Arc length
U373	Sector area
U617	Volume of a sphere
U116, U915	Volume of a cone and cylinder
U771	Surface are of a sphere
U771, U464	Surface are of cones and cylinders

Fractional parts of a circle

A circle is made up of 360°

Formula to remember:
Area of a circle = πr^2
Circumference of a circle = πd or $2\pi r$



30° represents $\frac{30}{360}$ of a full circle

$\frac{30}{360} = \frac{1}{12}$

$\frac{270}{360}$ of a full circle (in degrees)

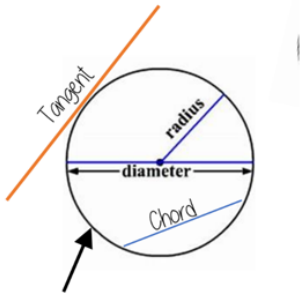
$\frac{6}{8}$ of a full circle (in equal parts)

$\frac{3}{4}$ of a full circle

The fraction of the circle is as $\frac{\theta}{360}$

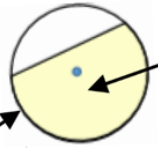
θ represents the degrees in the sector

Parts of a circle R



Circumference

Sector (part of the circle made from two radii)

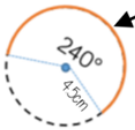


Segment (part of the circle made from a chord)

An arc is a part of the circumference

Arc length

Remember an arc is part of the circumference
Circumference of the whole circle = $\pi d = \pi \times 9 = 9\pi$



Arc length = $\frac{\theta}{360} \times$ circumference

$= \frac{240}{360} \times 9\pi$

$= \frac{2}{3} \times 9\pi = \underline{6\pi}$

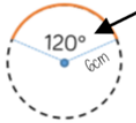
Perimeter

Perimeter is the length around the outside of the shape
This includes the arc length and the radii that encloses the shape

Perimeter = $\frac{\theta}{360} \times$ circumference $+ 2r$ $= \underline{6\pi + 9}$

Sector area

Remember a sector is part of a circle
Area of the whole circle = $\pi r^2 = \pi \times 6^2 = 36\pi$



Sector area = $\frac{\theta}{360} \times$ area of circle

$= \frac{120}{360} \times 36\pi$

$= \frac{1}{3} \times 36\pi = \underline{12\pi}$

Volume of a sphere

Volume Sphere = $\frac{4}{3}\pi r^3$

NOTE: This is now a **cubed** value

Volume Sphere = $\frac{4}{3}\pi r^3$

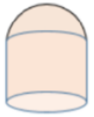
$= \frac{4}{3} \times \pi \times 3^3$

$= \frac{4}{3} \times \pi \times 27 = \underline{36\pi}$

A hemisphere is half the volume of the overall sphere $= 36\pi \div 2$

$= 18\pi$

Look out for hemispheres being placed on other 3D shapes, e.g cones and cylinders



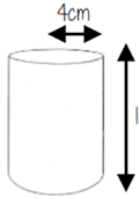
Volume of a cone and a cylinder

Volume Cylinder = $\pi r^2 h$

A cylinder is a prism – cross section is a circle

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

A cone is a pyramid with a circular base



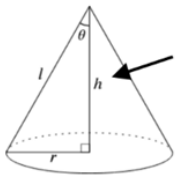
$V = \pi r^2 h$

$= \pi \times 4^2 \times 10$

$= \pi \times 160$

$= \underline{160\pi}$ cm^2

Give your answer in terms of π' means NOT in terms of pi $= \underline{502.7}$cm^2

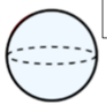


The height of a cone is the perpendicular height from the vertex to the base

Look out for trigonometry or Pythagoras theorem – the radius forms the base of a right-angled triangle

Surface area of a sphere

Surface area = $4\pi r^2$



Radius = 5cm

Surface area = $4\pi r^2$

$= 4 \times \pi \times 5^2$

$= 4 \times \pi \times 25$

The curved surface area of a sphere $= \underline{100\pi}$

A hemisphere has the curved surface AND a flat circular face

$= 100\pi \div 2 = 50\pi$

$= 50\pi + \pi \times 5^2$

Hemisphere $= \underline{75\pi}$

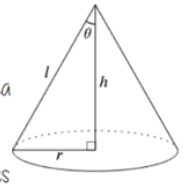
Surface area of cones and cylinders

Surface area cylinder = $2\pi r^2 + \pi dh$

The area of two circles (top and bottom face) + the area of the curved face

The length of shape B is the circumference of the circles

Curved surface area Cone = πrl



Look out for the use of Pythagoras to calculate the length l

Total surface area = curved face + circle face (area of base)

Maths: 10.07 Vectors.....

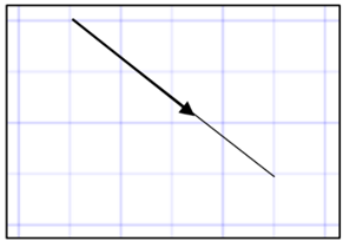
Key words	
Direction	the line our course something is going Magnitude: the magnitude of a vector is its length
Scalar	a single number used to represent the multiplier when working with vectors
Column vector	a matrix of one column describing the movement from a point
Resultant	the vector that is the sum of two or more other vectors
Parallel	straight lines that never meet

Sparx codes for this topic	
U632	Understand and represent vectors
U564, U660	Vectors multiplied by scalar
U903	Addition and subtraction of vectors
U781, U560	Extension

Understand and represent vectors

Column vectors have been seen in translations to describe the movement of one image onto another

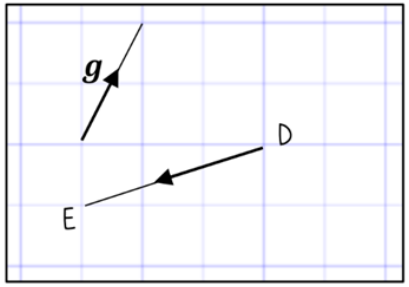
Movement along the x-axis → $\begin{pmatrix} 4 \\ -3 \end{pmatrix}$ ← Movement along the y-axis



Vectors show both direction and magnitude

The arrow is pointing in the direction from starting point to end point of the vector	The direction is important to correctly write the vector	The magnitude is the length of the vector (This is calculated using Pythagoras theorem and forming a right-angled triangle with auxiliary lines)	The magnitude stays the same even if the direction changes

Understand and represent vectors



Vector notation $\overrightarrow{DE}$ is another way to represent the vector joining the point D to the point E

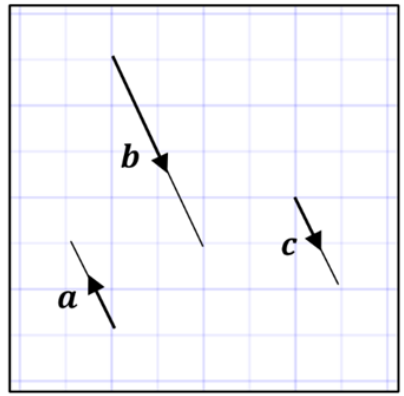
$$\overrightarrow{DE} = \begin{pmatrix} -3 \\ -1 \end{pmatrix}$$

The arrow also indicates the direction from point D to point E

Vectors can also be written in bold lower case so $\boldsymbol{g}$ represents the vector $\boldsymbol{g} = \begin{pmatrix} 1 \\ 2 \end{pmatrix}$

Vectors multiplied by a scalar

Parallel vectors are scalar multiples of each other



$\boldsymbol{b} = 2 \times \boldsymbol{c} = 2\boldsymbol{c}$

Multiply $\boldsymbol{c}$ by 2 this becomes $\boldsymbol{b}$. The two lines are parallel

$\boldsymbol{a} = -1 \times \boldsymbol{c} = -\boldsymbol{c}$

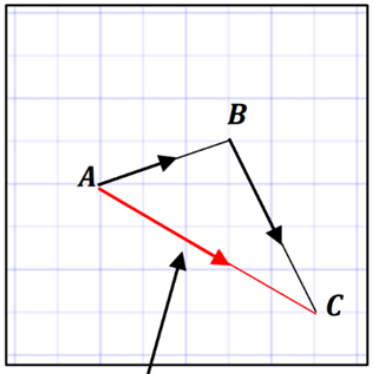
The vectors $\boldsymbol{a}$ and $\boldsymbol{c}$ are also parallel. A negative scalar causes the vector to reverse direction

$\boldsymbol{b} = -2 \times \boldsymbol{a} = -2\boldsymbol{a}$

$\boldsymbol{a} = \begin{pmatrix} -1 \\ 2 \end{pmatrix}$ $\boldsymbol{b} = \begin{pmatrix} 2 \\ -4 \end{pmatrix}$ $\boldsymbol{c} = \begin{pmatrix} 1 \\ -2 \end{pmatrix}$

Addition of vectors

$\overrightarrow{AB} = \begin{pmatrix} 3 \\ 1 \end{pmatrix}$ $\overrightarrow{BC} = \begin{pmatrix} 2 \\ -4 \end{pmatrix}$



The resultant

$$\overrightarrow{AB} + \overrightarrow{BC}$$

$$= \begin{pmatrix} 3 \\ 1 \end{pmatrix} + \begin{pmatrix} 2 \\ -4 \end{pmatrix}$$

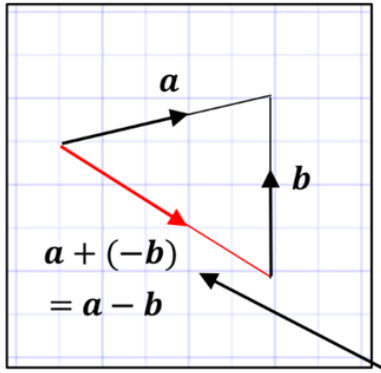
$$= \begin{pmatrix} 3+2 \\ 1+-4 \end{pmatrix}$$

$$\overrightarrow{AC} = \begin{pmatrix} 5 \\ -3 \end{pmatrix}$$

Look how this addition compares to the vector $\overrightarrow{AC}$

$$\overrightarrow{AB} + \overrightarrow{BC} = \overrightarrow{AC} = \begin{pmatrix} 5 \\ -3 \end{pmatrix}$$

Addition and subtraction of vectors



$\boldsymbol{a} = \begin{pmatrix} 5 \\ 1 \end{pmatrix}$ $\boldsymbol{b} = \begin{pmatrix} 0 \\ 4 \end{pmatrix}$

$$\boldsymbol{a} + (-\boldsymbol{b}) = \begin{pmatrix} 5 + & -0 \\ 1 + & -4 \end{pmatrix} = \begin{pmatrix} 5 \\ -4 \end{pmatrix}$$

The resultant is $\boldsymbol{a} - \boldsymbol{b}$ because the vector is in the opposite direction to b which needs a scalar of -1

Maths: 10.08 Ratio and fractions.....

Key words	
Ratio	a statement of how two numbers compare Equivalent: of equal value
Proportion	a statement that links two ratios
Integer	whole number, can be positive, negative or zero
Fraction	represents how many parts of a whole
Denominator	the number below the line on a fraction. The number represent the total number of parts
Numerator	the number above the line on a fraction. The top number. Represents how many parts are taken
Origin	(0,0) on a graph. The point the two axes cross
Gradient	The steepness of a line

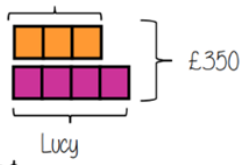
Sparx codes for this topic	
M525	Sharing a whole into a given ratio
M267	Ratios and fractions
M885	Compare with a ratio
U610	Conversion between currencies
M543	Ratios in 1:n
M112	Ratios and scale
M681	Best buys

Sharing a whole into a given ratio

James and Lucy share £350 in the ratio 3:4
Work out how much each person earns

Model the Question

James: Lucy
3 : 4



Find the value of one part

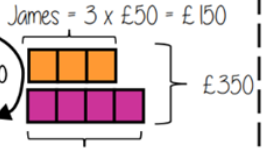
Whole: £350
7 parts to share between
(3 James, 4 Lucy)

£350 ÷ 7 = £50

□ = one part
= £50

Put back into the question

James: Lucy
x 50 3 : 4 x 50
£150:£200



Lucy = 4 x £50 = £200

Compare with ratio

"For every dog there are 2 cats"

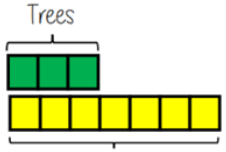
Dogs: Cats
1:2

The ratio has to be written in the same order as the information is given
e.g. 2:1 would represent 2 dogs for every 1 cat

Units have the be of the same value to compare ratios

Ratios and fraction

Trees: Flowers
3 : 7



Ratio

Fraction of trees

Number of parts of in group / Total number of parts

3/10

Fraction

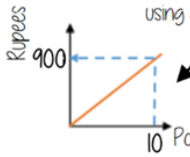
Conversion between currencies

For every £1 I have 90 Rupees

£1 = 90 Rupees ← Currency is directly proportional

£1 = 90 Rupees (x 10 / x 10)
£10 = 900 Rupees

Currency can be converted using a conversion graph



Convert 630 Rupees into Pounds

£1 = 90 Rupees (x 7 / x 7)
£7 = 630 Rupees

630 ÷ 90 = 7

Ratios in 1:n and n:1

This is asking you to cancel down until the part indicated represents 1

Show the ratio 4:20 in the ratio of 1:n

The question states that this part has to be 1 unit
Therefore Divide by 4

4 : 20
1 : 5

This side has to be divided by 4 too – to keep in proportion

the n part does not have to be an integer for this type of question

Ratio and scale

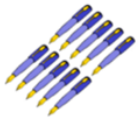
A picture of a car is drawn with a scale of 1:30

The car image is 10cm

Image : Real life
1cm : 30cm (x 10)
10cm : 300cm (x 10)

Best buys

4 pens costs £2.60



10 pens costs £6.00

"1 pen costs..." £2.60 ÷ 4 = £0.65 | £6.00 ÷ 10 = £0.60

"1-pound buys..." 4 ÷ 2.60 = 1.54 pens | 10 ÷ 6 = 1.67 pens

You could work out how much 40 pens are and then compare

Compare the solution in the context of the question

The best value has the lowest cost "per pen"

The best value means £1 buys you more pens

Combining ratios

The ratio of Blue counters to Red counters is 5:3

The ratio of Red counters to Green counters is 2:1

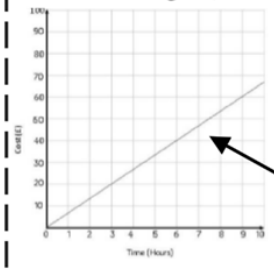
Ratio of Blue to Red to Green

10 : 6 : 3

Use equivalent ratios to allow comparison of the group that is common to both statements

Lowest common multiple of the ratio both statements share

Ratio and graphs



The gradient is the constant ratio

Graphs with a constant ratio are directly proportional

- Form a straight line
- Pass through (0,0)

Maths: 10.09 Percentages & interest.....

Key words	
Exponent	how many times we use a number in multiplication. It is written as a power
Compound interest	calculating interest on both the amount plus previous interest
Depreciation	a decrease in the value of something over time
Growth	where a value increases in proportion to its current value such as doubling
Decay	the process of reducing an amount by a consistent percentage rate over time
Multiplier	the number you are multiplying by
Equivalent	of equal value

Sparx codes for this topic	
M264	M264 Compare FDP
M437, M905	Fraction/percentage of an amount
M235	Express as a percentage
M476, M533	Percentage increase/decrease
U332	Simple compound interest
U988	Growth and decay
M528	Find the original amount

Compare FDP

Comparisons are easier in the same format

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

Using a calculator: $\frac{\square}{\square}$ → 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

Find $\frac{3}{5}$ of £60

£60 = £12 £12 £12 £12 £12

£36

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

Express as a percentage

27 per every 50 shaded → $\frac{27}{50}$

54 per every 100 shaded → $\frac{54}{100}$

54%

$\frac{13}{30}$ → $\frac{\square}{\square}$ → $\frac{13}{30}$ → × 100

43.3333...%

43%

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

Decimal percentages are still a percentage.

Percentage increase/decrease

100% − 42% = Decrease by 58%

100% − 58% = 42%

100 − 058 = 042

Multiplier: Less than 1

100% + 12% = Increase by 12%

100% + 12% = 112%

100 + 012 = 112

Multiplier: More than 1

Simple and compound interest

Simple Interest

James invests £2000 at 5% simple interest

100% = £2000, 5% = £100

The original value increases by this amount every year

Compound Interest

Tess invests £100 at 10% compound interest for 3 years

£100 Original amount £100

10% → £10 → Y1: £110

10% → £11 → Y2: £121

10% → £12.10 → Y3: £132.10

The multiplier 1.10 repeats each year

Repeated percentage change

Compound Interest

Tess invests £100 at 10% compound interest for 3 years

£100 × 1.10 × 1.10 × 1.10

£100 × 1.10 (3)

Original amount; Repeated multiplier; Number of occurrences

Depreciation

Depreciation calculations use multipliers **less than** 1

Multipliers are commutative – an overall multiplier effect can be calculated by combining the multipliers separately

e.g. Increase of 10% then a reduction of 10%

× 1.10 × 0.9 = × 0.99 The multiplier

Growth and decay

Compound growth

Compound decay

Compound growth and compound decay are exponential graphs

Decay – the values get closer to 0

The constant multiplier is less than one

Growth – the values increase exponentially

The constant multiplier is more than one

Find the original value

Percentage calculations

Original amount × Multiplier = Final Value

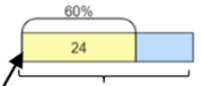
In a test Lucy scored 60% of her questions correctly. Her score was 24. How many questions were on the test.

Original × 0.6 = 24

24 ÷ 0.6 = 40 marks

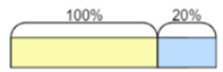
10% = 6

100% = 40



Total questions on test

A car sold for a profit £3000 with a profit of 20%. How much was the car originally?



£3000

Original × 1.2 = 3000

120% = £3000

10% = £250

100% = £2500

Maths: 10.10 Probability.....

Key words	
Event	one or more outcomes from an experiment
Outcome	the result of an experiment
Intersection	elements (parts) that are common to both sets
Union	the combination of elements in two sets
Expected Value	the value/ outcome that a prediction would suggest you will get
Universal Set	the set that has all the elements
Systematic	ordering values or outcomes with a strategy and sequence
Product	the answer when two or more values are multiplied together

Sparx codes for this topic	
M941, M755, M938	Probability
M332, M206	Experimental data
	Sample Space
M835	Fractions
M899, M419	Tables, Venn diagrams, Frequency trees
M299	Independent events
M572	Dependent events

Likeliness of a probability

Impossible 0 or 0% | Even chance 0.5, $\frac{1}{2}$ or 50% | Certain 1 or 100%

The more likely an event the further up the probability it will be in comparison to another event. (It will have a probability closer to 1)

Sum to 1

Probability is always a value between 0 and 1

The probability of getting a blue ball is $\frac{1}{5}$

$\therefore$ The probability of NOT getting a blue ball is $\frac{4}{5}$

The sum of the probabilities is 1

Experimental data

Theoretical probability — What we expect to happen

Experimental probability — What actually happens when we try it out

The more trials that are completed the closer experimental probability and theoretical probability become

The probability becomes more accurate with more trials.
Theoretical probability is proportional

Sample space

The possible outcomes from rolling a dice

The possible outcomes from tossing a coin

	1	2	3	4	5	6
H	1,H	2,H	3,H	4,H	5,H	6,H
T	1,T	2,T	3,T	4,T	5,T	6,T

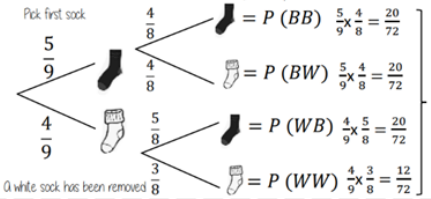
P (Even number and tails) = $\frac{3}{12}$

Dependent events

Tree diagram for dependent event

The outcome of the first event has an impact on the second event

A sock drawer has 5 black and 4 white socks, Jamie picks 2 socks from the drawer

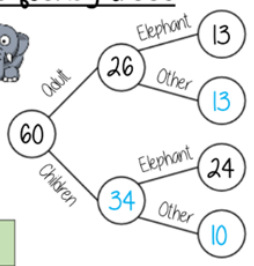


NOTE: as "socks" are removed from the drawer the number of items in that drawer is also reduced ∴ the denominator is also reduced for the second pick.

Tables, Venn diagrams, Frequency trees

Frequency trees

60 people visited the zoo one Saturday morning. 26 of them were adults. 13 of the adult's favourite animal was an elephant. 24 of the children's favourite animal was an elephant.



Two-way table

	Adult	Child	Total
Elephant	13	24	37
Other	13	10	23
Total	26	34	60

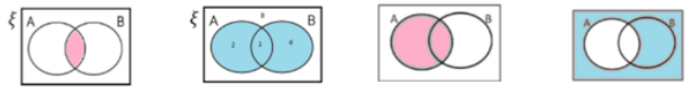
Frequency trees and two-way tables can show the same information

The total columns on two-way tables show the possible denominators

P(adult) = $\frac{26}{60}$

P(Child with favourite animal as elephant) = $\frac{13}{37}$

Venn diagram



in set A AND set B — $P(A \cap B)$

in set A OR set B — $P(A \cup B)$

in set A — $P(A)$

NOT in set A — $P(A')$

Independent events

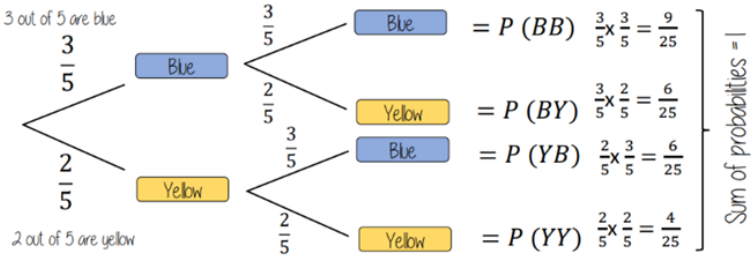
The outcome of two events happening. The outcome of the first event has no bearing on the outcome of the other

$P(A \text{ and } B) = P(A) \times P(B)$

Tree diagram for independent event

Isobel has a bag with 3 blue counters and 2 yellow. She picks a counter and replaces it before the second pick.

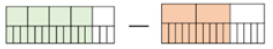
Because they are replaced the second pick has the same probability



Add, Subtract and multiply fractions

Addition and Subtraction

$\frac{4}{5}-\frac{2}{3}$



$\frac{12}{15}-\frac{10}{15}=\frac{2}{15}$

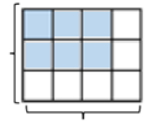
Use equivalent fractions to find a common multiple for both denominators

Multiplication

$\frac{3}{4}\times\frac{2}{3}$

$\frac{3}{4}\times\frac{2}{3}=\frac{6}{12}$ ← Parts shaded

Modelled:



Total number of parts in the diagram

Maths: 10.11 Collecting, representing & interpreting data.....

Key words	
Population	the whole group that is being studied
Sample	a selection taken from the population that will let you find out information about the larger group
Representative	a sample group that accurately represents the population
Random sample	a group completely chosen by change. No predictability to who it will include
Bias	a built-in error that makes all values wrong by a certain amount
Primary data	data collected from an original source for a purpose
Secondary data	data taken from an external location. Not collected directly
Outlier	a value that stands apart from the data set

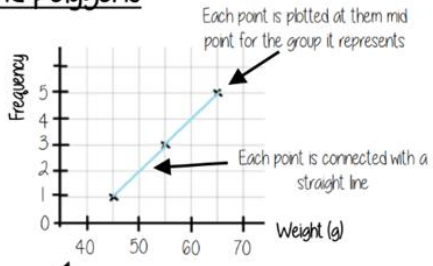
Sparx codes for this topic	
U840	Frequency tables & polygons
U363, U557	Bar & line charts
U508, U172	Draw & interpret pie charts
U981	Two-way tables
U291, U456, U260, U526, U7171	Averages from a list
U569, U877	Averages from a table
U200, U909	Stem & leaf
U199, U277, U128	Scatter graphs

Frequency tables and polygons

x Weight(g)	Frequency
$40 < x \leq 50$	1
$50 < x \leq 60$	3
$60 < x \leq 70$	5

We do not know from grouped data where each value is placed so have to use an estimate for calculations

MID POINTS
Mid-points are used as estimated values for grouped data. The middle of each group



Mid-point
Start point + End point
2

Draw and interpret Pie Charts R

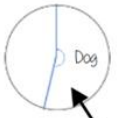
Type of pet	Dog	Cat	Hamster
Frequency	32	25	3

There were 60 people asked in this survey (Total frequency)

$\frac{32}{60}$ "32 out of 60 people had a dog"

This fraction of the 360 degrees represents dogs

$\frac{32}{60} \times 360 = 192°$



Use a protractor to draw This is 192°

Multiple method
Os 60 goes into 360 – 6 times
Each frequency can be multiplied by 6 to find the degrees (proportion of 360)

Comparing Pie Charts
You NEED the overall frequency to make any comparisons

Averages from a table R

Non-grouped data

The data in a list: 0,0,0,0,0,1,1,1,1,1,1,2,2,2,2,2

Mean: total number of siblings ÷ Total frequency

Number of Siblings	Frequency	Subtotal
0	6	0
1	8	8
2	6	12

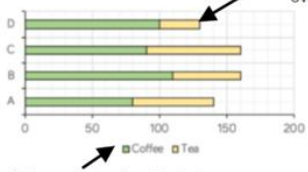
Total number of siblings 20

Overall Frequency 20

Bar and line charts

Compare the bars green compared to yellow. The size of each bar is the frequency. Overall total easily comparable.

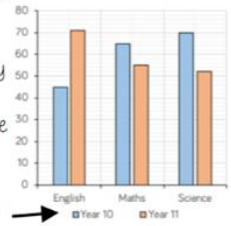
Composite bar charts



Categories clearly indicated

Dual bar charts

Bars are compared side by side
Easier to compare subgroups



Categories clearly indicated

Two way tables R

60 people visited the zoo one Saturday morning.
26 of them were adults. 13 of the adult's favourite animal was an elephant. 24 of the children's favourite animal was an elephant.

Extract information to input to the two-way table.

Subgroups each have their own heading

	Adult	Child	Total
Elephant	13	24	37
Other	13	10	23
Total	26	34	60

Needs subgroup totals

Overall total

Averages from a table R

Grouped data

x Weight(g)	Frequency	Mid Point	MP x Freq
$40 < x \leq 50$	1	45	45
$50 < x \leq 60$	3	65	195
$60 < x \leq 70$	5	65	325

Overall Frequency: 9

Overall Total : 565

Mean: 62.8g

The data in a list: 45, 55, 55, 55, 65, 65, 65, 65, 65

Averages from lists R

The Mean

A measure of average to find the central tendency... a typical value that represents the data

24, 8, 4, 11, 8,

Find the sum of the data (add the values)

55

Divide the overall total by how many pieces of data you have

55 ÷ 5

Mean = 11

The Mode (The modal value)

This is the number OR the item that occurs the most (it does not have to be numerical)

24, 8, 4, 11, 8,

This can still be easier if it the data is ordered first

Mode = 8

The Median

The value in the center (in the middle) of the data

24, 8, 4, 11, 8,

Put the data in order 4, 8, 8, 11, 24

Find the value in the middle 4, 8, 8, 11, 24

Median = 8

NOTE: If there is no single middle value find the mean of the two numbers left

For Grouped Data

The modal group – which group has the highest frequency

THE HECTIC TEACHER
RESOURCE

CONSENT

Personal Development

Define: *Sexual Consent*

The giving of permission by a person to engage in any form of sexual activity including penetrative and oral sex.

Define: *Affirmative Consent*

Consent is only given when a person agrees verbally to engage in sexual activities including penetrative and oral sex.

Define: *Coercion*

The action or practice of persuading someone to do something they wouldn't normally do or something they don't want to do by using force or threats.

Define: *A person who is a minor*

A person who is under the age of 18 and legally considered a child.

Consent is:

1	**Freely given.** It's not okay to pressure, trick, or threaten someone into saying yes.
2	**Reversible.** It's okay to say yes and then change your mind — at any time!
3	**Informed.** You can only consent to something if you have all the facts.
4	**Enthusiastic.** You should do stuff you WANT to do, not things people expect you to do. If someone doesn't seem enthusiastic stop and check in.
5	**Specific.** Saying yes to one thing (like going to the bedroom to make out) doesn't mean you're saying yes to other things (like having sex).

When can consent not be given?

1	**When a person is drunk or high,** to the point that they are unable to speak or look after themselves.
2	**Asleep or Passed Out** – if they are not conscious they are unable to agree to any sexual activity. If someone passes out whilst engaging in sexual activity – STOP!
3	**They are Underage –** Legally a person under the age of 16 cannot give consent to any sexual activity.
4	**Mental disability or learning difficulties** which mean they are unable to fully understand what they are consenting to.

What does the Law say?

Act	Definition	Consequence
Rape	A rape is when a person uses their penis without consent to penetrate the vagina, mouth, or anus of another person.	**Rape** is punished by a maximum of fifteen years' in prison. **Aggravated Rape** is punished by a maximum of twenty years' in prison Both offences would result in placement on the sex offenders register.
Sexual Assault	Sexual assault is when a person is coerced or physically forced to engage against their will, or when a person, touches another person sexually without their consent. Touching can be done with any part of the body or with an object.	Up to 10 years in prison and placement on the sex offenders register
Sex Between Minors	When both parties involved the sexual activity are under 16 but have consented to the activity.	Technically the law is that **if two** 13 – 15 year old's engage in consensual sexual activity and each knows that the other is under 16, they will both be guilty of an offence carrying a maximum penalty of five years' imprisonment, however it is unlikely the CPS will prosecute. If one party is under 13 and the other under 18 it is statutory Rape which is punishable by Life imprisonment, but the average is 6-7 years when prosecuted.

Who Can you turn to for help and Support

Parents or trusted family members	The Police / Community support officers
School Safe Guarding Team or any member of staff.	
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
Rape Crisis	Helpline: 0808 802 9999 (12-2:30 and 7-9:30) rapecrisis.org.uk
Survivors UK – Male Rape and Sexual Abuse Support	survivorsuk.org
RASAC (Rape and Sexual Abuse Support Centre)	National Helpline: 0808 802 9999 (12-2.30 & 7-9.30) rasasc.org.uk

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MENTAL WELLBEING

Personal Development

Define: *Mental Wellbeing*

Mental wellbeing describes your mental state - how you are feeling and how well you can cope with day-to-day life. Our mental wellbeing is dynamic. It can change from moment to moment, day to day, month to month or year to year.

Define: *Emotional Literacy*

The ability to understand and express feelings.
Emotional Literacy involves having self-awareness and recognition of one's own feelings and knowing how to manage them.

Define: *Primary Emotions*

There are 5 primary emotions but over 600 words in the English language for different emotions. The primary emotion groups are:

1. Joy
2. Anger
3. Sadness
4. Disgust
5. Fear

Define: *Mental Illness*

Mental illnesses comprise of a broad range of problems, with different symptoms. However, they are generally characterized by some combination of abnormal thoughts, emotions, behaviour and relationships with others.

They can only be diagnosed by a Doctor or Mental Health Professional

Signs of good mental wellbeing

- Feeling relatively confident in yourself and have positive self-esteem
- Feeling and express a range of emotions
- Building and maintaining good relationships with others
- Feel engaged with the world around you
- Live and work productively
- Cope with the stresses of daily life
- Adapt and manage in times of change and uncertainty

Things that can affect our mental wellbeing

Everyone is different and what affects someone's mental wellbeing won't necessarily affect others in the same way. Everyone will have times when they have low mental wellbeing, where they feel stressed, upset or find it difficult to cope.
Common life events that can affect your mental wellbeing include:

- loss or bereavement
- loneliness
- relationship problems
- issues at work
- worry about money

However there are times when there is no discernable reason for the way a person feels which can be extremely frustrating.

There are some factors that may make people more vulnerable to experiencing a period of poor mental wellbeing. These may have happened in the past or might still be happening now:

- Childhood abuse, trauma, violence or neglect
- Social isolation or discrimination
- Homelessness or poor housing
- A long-term physical health condition
- Social disadvantage, poverty or debt
- Unemployment
- Caring for a family member or friend
- Significant trauma as an adult, such as military combat, being involved in a serious accident or violent crime

Signs of poor mental wellbeing

- Erratic changes in mood and behavior
- Distancing from friends and family.
- Loss of interest in things that they used to be interested in.
- Excessive sleeping or not sleeping.
- Increased alcohol consumption.
- Poor concentration and being easily distracted
- Finding it hard to make decisions
- Feeling overwhelmed by things & tearfulness
- Finding it difficult to control your emotions
- Irritability and short temper or aggression

The Importance of Positive Relationships

Connecting with others can help us to feel a greater sense of belonging and can help to challenge feelings of loneliness.

- **Make time for the people you love.** Keeping regular contact with friends and family, whether it's face-to-face, on the phone or by text, can strengthen your relationships.
- **Join a group.** Think of the things you like to do, such as drawing, gardening or sport and look for local groups. Meeting others with a shared interest can increase your confidence and build your support network.
- **Talk about the way you feel.** Opening up to a trusted friend or family member can help you to feel listened to and supported. Just acknowledging your feelings by saying them out loud can help.
- **Use peer support.** If you're finding things difficult, talking to people who have similar feelings or experiences can help you to feel accepted.

The Importance of Self Care

At times people may feel guilty for spending time on themselves. But it's essential for mental wellbeing and can help people to be more resilient.

Some self care techniques include

- Mindfulness
- Doing something you enjoy
- Relaxation techniques
- Get outdoors and fresh air
- Exercise

If someone is living with a mental health problem, taking steps to look after their mental health can help you improve your wellbeing.
Strategies can include:

- Talking to someone
- Knowing triggers and warning signs
- Keeping a mood diary
- Building your self esteem.

Where to get more help and support

- Parents and trusted family.
- School Staff and Wellbeing Team
- Your Doctor or Practice Nurse
- MIND - https://www.mind.org.uk Help line - **0300 123 3393** open 9am to 7pm, Monday to Friday or Text: 86463
- Young Minds - https://youngminds.org.uk Text: 85258 or Parents Helpline: 0808 802 5544
- Stem4 - https://stem4.org.uk/

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Body Image and Eating Disorders

Personal Development

Define: *Body Image*

The perception that a person has of their physical self and the thoughts and feelings that result from that perception.

Define: *Eating Disorder*

Any of a range of psychological disorders characterized by abnormal or disturbed eating habits

Define: *Anorexia*

An emotional disorder characterized by an obsessive desire to lose weight by refusing to eat.

Define: *Bulimia*

An emotional disorder characterized by a distorted body image and an obsessive desire to lose weight, in which bouts of extreme overeating are followed by fasting or self-induced vomiting or purging.

Define: *Binge Eating*

The consumption of large quantities of food in a short period of time, typically as part of an eating disorder.

Factors affecting body image

- Puberty and the changing body.
- The Media
- Peers and Family

Ways to promote positive body image

- Accept Your Body.
- Remember Nobody's perfect.
- Don't body-shame yourself.
- Build a better habits.
- Like Your Body - Find things to like about your looks.
- Take Care of Your Body
- Eat healthy foods.
- Get a good nights sleep.
- Be active every day.
- Keep to a healthy weight.

Statistics on Eating Disorders

- Between 1.25 and 3.4 million people in the UK are affected by an eating disorder
- Around 25% of those affected by an eating disorder are male
- Eating disorder are most common in individuals between the ages of 16 and 40 years old

Causes of Eating Disorders

Eating disorders are not simply about food; the behaviours that accompany them may often serve as a coping mechanism or a way to feel in control. Eating disorders have many causes which are individual to the person however some common causes are:

- Distorted Body Image
- Bullying
- Depression and/or Anxiety

Symptoms of Eating Disorders

Symptoms of eating disorders will vary between individuals and type of eating disorder. Not matching the symptoms exactly does not mean that someone does not have an eating disorder, however, some common symptoms include:

- Eating very little food or eating large amounts of food in a short time in an uncontrolled way
- Having very strict habits, rituals, or routines around food
- Spending a lot of time worrying about your body weight and shape
- Changes in mood
- Deliberately making yourself ill after eating
- Avoiding socialising when food may be involved
- Withdrawing from social groups, hobbies you used to enjoy or from family life
- Physical signs such as digestive problems or weight being very high or very low for someone of your age and height.

Treatments for Eating Disorders

Although there is no easy treatment for eating disorders, they are treatable and manageable. The treatment will often be linked to the underlying causes of the eating disorder.
Common treatments include:

- Cognitive behavior therapy
- Talk Therapy
- Group support
- Medication – Anti-Depressants

The best course of treatments will be decided by a Doctor and team of specialists. In sever cases in-patient treatment might be necessary.

Where to get more help and support

- Parents and trusted family
- School Staff, school nurse and Wellbeing Team
- Your GP or Practice Nurse
- Youth Access - www.youthaccess.org.uk
- The Mix - www.themix.org.uk
  Freephone: 0808 808 4994 (13:00-23:00 daily)
- B-eat - www.b-eat.co.uk
  Helpline: 0808 801 0711 (Daily 3pm-10pm)
- Men Get Eating Disorders Too - .mengetedstoo.co.uk
- Anorexia & Bulimia Care - exiabulimiacare.org.uk
  Helpline 03000 11 12 13 (option 1: support line, option 2: family and friends)

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PORNOGRAPHY

Personal Development

Define: *Pornography*

Printed or visual material containing the explicit description or display of sexual organs or activity, intended to stimulate sexual excitement.

Define: *Soft Porn*

Films, magazines, photographs etc. that show sexual images such as nudity but not sexual acts

Define: *Hardcore Porn*

Films, magazines, photographs etc. that shows sex in a very detailed way, or shows very violent or unpleasant sex.

Define: *Child Pornography*

Sexually explicit material depicting anyone under the age of 18.

Define: *Revenge Porn*

Revealing or sexually explicit images or videos of a person posted on the Internet, typically by a former sexual partner, without the consent of the subject and in order to cause them distress or embarrassment.

Define: *Sexting*

Sending sexually explicit messages or pictures via mobile phones, instant messaging or email.

Pornography Laws in the UK

- It is legal to watch pornography in the UK as long as it doesn't feature under 18's, sex with animals, torture, scenes of rape or sexual assault, scenes which are violent to the point of life threatening or likely to cause serious harm.
- Pornographic material can be shown on TV after 9pm as long as it doesn't show erect penises or close ups of genitals.
- The legal age to buy pornographic material is 18, be this magazine, DVD's or internet access. The internet tries to prevent under-age access using credit cards or disclaimers.
- Under 18's who film or take sexual pictures of themselves or others can be charged with child pornography offences which can lead to prison sentences of up to 10 years. Even if all involved agreed.
- It is illegal to watch pornography with an under 18, this is considered a form of abuse.
- It is illegal to make and/or distribute pornographic photographs or films without all participants knowledge and consent. This can lead to up to 2 years in prison.

Ways in which Pornography can distort views of relationships and Sex

- Sex ends when the man ejaculates and orgasms.
- Women orgasm every time they have sex.
- People use insults and abusive language when having sex.
- Everyone wants to have sex all the time.
- Sex is an aggressive act of dominance of one partner over another.
- Women are portrayed as bored and sexually frustrated.
- People want to have sex with more than one person at a time.
- External ejaculation is expected and common.
- Anal Sex is common and popular amongst heterosexual couples.
- Sex is good every time.
- Penises are large (over 6inches)
- Sex is all about what men want and men are in control.
- Women are expected to dress up and wear make up for sex.
- Sex is loud.
- Consent to sex means all sex acts.
- You must look and dress a certain way to be considered sexy.

Where to get more help and support

- Parents and trusted family members
- Teachers and School Staff including School Nurse and Wellbeing Team
- Report any inappropriate images to the website.
- NSPCC - https://www.nspcc.org.uk
- Childline - Helpline: 0800 1111(24 hours, every day) / https://www.childline.org.uk
- CEOPS - https://www.ceop.police.uk/safety-centre/

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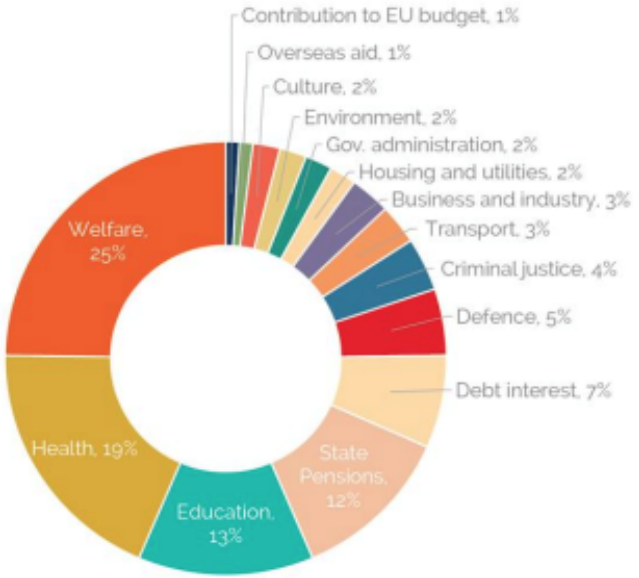
Taxation and Deductions

Personal Development

How is taxation spent by the government



What do National Insurance Contributions go towards

- State retirement pension;
- Bereavement benefits for spouse/civil partner;
- Contribution-based Jobseeker's allowance;
- Contribution-based Employment and Support Allowance.
- The NHS

National Insurance payments cannot be used directly to fund general government **spending**.

What happens if I don't pay Income Tax

Most people pay Income Tax through PAYE. This is the system your employer or pension provider uses to take Income Tax before they pay your wages or pension.

If your employer makes a mistake and under pays your tax, you could be made to repay that amount through the next years PAYE if the amount is under £3,000 and you earn under £30,000 per year.

In some very limited circumstances, it may be possible for HMRC to write off the debt, or, if your employer or pension payer is at fault, to collect the tax from them instead.

If you are a self-employed person, you are responsible for filing your tax returns each year with the HMRC.
Failure to do so or filing late or inaccurate returns can result in a HMRC Enquiry.

If the enquiry find you are guilty of deliberately misleading or falsify your tax record you can be prosecuted for fraud.

In most cases you will be given a bill for the unpaid tax and a set time frame to pay it back.

What happens if I don't pay National Insurance contributions

Most people pay National Insurance through PAYE. This is the system your employer or pension provider uses to take National Insurance contributions before they pay your wages or pension.

If your employer makes a mistake and under pays your national insurance, they can be fined and expected to make up the payments. You are not responsible if this is not paid.

If you do not pay any national insurance, then you may not be entitled to benefit pays mends which are considered "contributory Benefits" such as:

- Unemployment benefits, in the form of Jobseeker's Allowance (JSA) and Employment and Support Allowance (ESA)
- Maternity Allowance, if you don't qualify for statutory maternity pay
- Bereavement benefits (Bereavement Allowance, Bereavement Payment and Widowed Parent's Allowance)
- Incapacity Benefit, if you face long term unemployment because of illness or disability.

It does not affect your ability to apply for Universal Credit, PIP, Pensions or access to the NHS.

THE HECTIC TEACHER
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TAXATION AND DEDUCTIONS

Personal Development

Define: *Taxation*

A means by which governments finance their expenditure by imposing charges on citizens and corporate entities.

Define: *Deductions*

Any item or expenditure subtracted from gross income to reduce the amount of income.

Define: *National Insurance*

The system of compulsory payments by employees and employers to provide state assistance for people who are sick, unemployed, or retired.

Define: *Direct Taxation*

Are usually obvious amounts such as income tax which you can see being taken from your pay or have to pay direct to HMRC. Other direct taxes include corporation tax, capital gains tax and inheritance tax.

Define: *Indirect Taxation*

This is less obvious than a direct tax as it is included in the price of things that you buy. E.G. VAT

Define: *Gross Income*

Total amount of income earned before any deductions.

Define: *Net Income*

Total amount of income you receive after all deductions

Types of Taxations in the UK

Income Tax	This is the tax levied directly on personal income. The amount of **income tax** you pay depends on two things: How much of your income is above your **Personal Allowance** How much of your income falls within each tax band
National Insurance Contributions	You pay this in order to qualify for certain benefits and State Pension. **Anyone over 16**, earning £157 or more each week, or is self-employed and has a profit of more than £6,025 a year is expected to pay **National Insurance**.
Consumption Tax (VAT)	It is found on most goods and services, with the standard **VAT rate being 20%**. In this category, you'll find goods such as alcoholic drinks, chocolate, prams and pushchairs, and taxi fares. There's a **reduced rate of 5%** levied on children's car seats, electricity, gas, heating oil and solid fuel, and mobility aids for the elderly, among other things. The **zero rated products** include books, meat and poultry, fruit and vegetables, and household water, etc.
Excise Duty	These are charged on things such as alcohol, tobacco, betting, and vehicles as well as the producer of these goods being charged. **Excise duties** are usually imposed in addition to an indirect tax such as VAT. The excise tax is included in the final sale price of the product, meaning that the consumer pays indirectly. Excise is used as a deterrent towards three broad categories of harm: • Health risks from abusing toxic substances e.g. tobacco or alcohol • Environmental damage e.g. fossil fuels • Socially damaging/morally objectionable activity e.g. gambling or soliciting
Corporation Tax	This is tax on company profit so you'll have to pay if you're doing business as: • A limited company • A foreign company with a UK branch or office • A club, co-operation, or other unincorporated association e.g. a sports club From 1st April 2017, the normal rate of **corporation tax is 19%**, this tax can be confusing as it must be paid before you file your company tax return, which leaves many businesses with two accounting periods, making it harder to keep an overview.
Stamp Duty	The **Stamp Duty Land Tax** (SDLT) has to be paid if you buy a property or land over **£125,000 for residential properties** and £150,000 for non-residential land and properties. The amount paid is dependent on the value of the property, but first time buyers maybe exempt from this tax.

How is income tax calculated.

As an employee:

- You pay 0% on earnings up to £12,500* for 2019-20
- Then you pay 20% on anything you earn between £12,501 and £50,000
- You'll pay 40% income tax on earnings between £50,001 to £150,000
- If you earn £150,001 and over you pay 45% tax.

For example, if you earn £52,000 a year, you pay:

- Nothing on the first £12,500
- 20% (£7,500.00) on the next £37,500
- 40% (£800) on the next £2,000.

Therefore you would expect to pay

- £8,300 per year / £691.66 per month

How is National Insurance calculated.

As an employee:
You pay National Insurance contributions if you earn more than £166 a week before tax you pay 12% of your earnings above this limit and up to £962 a week the rate drops to 2% of your earnings over £962 a week.

For example, if you earn £1,000 a week before tax, you pay:

- Nothing on the first £166
- 12% (£95.52) on the next £796
- 2% (£0.76) on the next £38.

Therefore you would expect to pay

- £96.28 per week / £417.21 per month

Employers pay 0% on employee's pay up to £156 a week (£8,112 a year); 13.8% on pay above this

GCSE PE

1.1.d. Respiratory System Key Terms		
1	**Aerobic capacity**	The maximum amount of oxygen your body can take in and use, measured with the V02 max test
2	**Aerobic Exercise/ Activity**	When oxygen is used for the duration of exercise to make energy, usually at moderate intensity at a continuous rate.
3	**Alveoli**	Small air sacks in the lungs which are the site of gas exchange.
4	**Anaerobic Exercise/ Activity**	'Without oxygen'. High intensity exercise for short periods of time where oxygen is <u>not</u> predominantly used to produce energy
5	**Breathing rate**	Number of breaths taken per minute
6	**Gas exchange**	The movement of O2 and CO2 between the alveoli and capillaries and the working muscles and capillaries.
7	**Minute ventilation**	(minute volume) Then volume of gas inhaled OR exhaled from the lungs in 1 minute
8	**Mitochondria**	the place in each muscle cell where energy is produced
9	**Respiratory Muscles**	Muscles which help air move in and out of the lungs (diaphragm and intercostals)
10	**Respiration system**	gets oxygen into the body and removes carbon dioxide. It's made up of the mouth/nose – bronchi- bronchioles and alveoli
11	**Tidal volume**	The amount of air breathed in or out in one breath. Measured in ml
12	**Trachea (windpipe)**	The pipe which connects the nose/mouth to the bronchi

1.2.c. Preventing Injury in Physical Activity and Training		
1	**Cool Down**	Low intensity exercise and stretching after strenuous exercise to slowly decrease, breathing rate and heart rate and muscle temperature to resting levels
2	**Hazards**	something which presents a risk that could cause and injury
3	**Personal Protective Equipment (PPE)**	All equipment/clothing which is intended to be worn/held to reduce the chance of injury
4	**Risk**	The chance that someone will be harmed by a hazard
5	**Risk Assessment**	When you measure the risk of something happening, anticipate what the consequences could be and plan actions to prevent it
6	**Warm Up**	Physical activity to prepare the body physically and mentally for exercise to prevent injury

GCSE PE

1.2.a. Components of Fitness Key Terms

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

Fitness The ability to meet the demands of your environment. It can be tested and improved.

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

A Great Photographic Composition

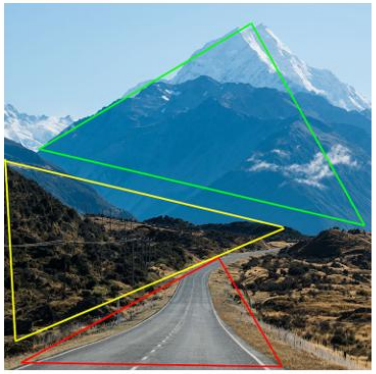
RULE OF THIRDS

FIBONACCI SPIRAL

FRAMING DEPTH

SYMMETRY

GOLDEN TRIANGLES



VANISHING POINT

LANDSCAPE DEPTH

PHI GRID

LEADING LINES

LINES AND PATTERNS

Physical Education

1.2.c. Preventing Injury in Physical Activity and Training		
1	**Cool Down**	Low intensity exercise and stretching after strenuous exercise to slowly decrease, breathing rate and heart rate and muscle temperature to resting levels
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6	**Warm Up**	Physical activity to prepare the body physically and mentally for exercise to prevent injury

1.1.d. Respiratory System Key Terms		
1	**Aerobic capacity**	The maximum amount of oxygen your body can take in and use, measured with the V02 max test
2	**Aerobic Exercise/ Activity**	When oxygen is used for the duration of exercise to make energy, usually at moderate intensity at a continuous rate.
3	**Alveoli**	Small air sacks in the lungs which are the site of gas exchange.
4	**Anaerobic Exercise/ Activity**	'Without oxygen'. High intensity exercise for short periods of time where oxygen is <u>not</u> predominantly used to produce energy
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Physical Education

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Religion & Philosophy GCSE 10. 2 Christian Practices—CORE

Topic 1: Worship & Prayer	
Worship	Celebration of love and thankfulness to God
Liturgical	Worship follows a set structure (Traditional)
Informal	Worship is free & improvised
Individual	Private worship
Prayer: with	Communicating with God
Set Prayers	Prayers that follow a set structure
Informal Prayer	Free and improvised prayer. More personal and less restrictive
Quaker Worship	Silent Meetings - Calming No Leader, anyone can minister
Evangelical Worship	Modern music, Intense Emotions Pastor Led, Attractive

Topic 2: Sacraments and Pilgrimage	
Sacrament	Outward sign of an inward blessing
Baptism	Ceremony of admission to the Church
Original Sin:	Stain of sin inherited by all from Adam and
Eucharist	Sacrament commemorating the Last Supper, With consecrated bread & wine.
Transubstantiation	The bread and wine literally become the body and blood of Christ (Catholic)
Pilgrimage	Journey to place of religious interest
Taize	Ecumenical. For the healing of divisions in the church. Young People.
Lourdes	(Catholic) A place of miraculous healing

Topic 3: Festivals	
Christmas Celebrated by	Midnight Mass, Nativity Plays, Religious Cards, Carols, Presents
Advent	Four Sundays leading to Christmas. Advent Candles—Hope, peace, Joy & love
Holy Week	Remembers the week before the Resurrection
Palm Sunday	Wave Palm crosses to remember Jesus as King
Maundy Thursday	Priest washes congregations feet. Share the Eucharist
Good Friday	Solemn day of reflection & confession
Easter Sunday	Celebration Songs. Sunrise service

Topic 5: The Church—Uk & Global	
Secular	Not defined by religious values e.g Modern UK law, culture and '*religious*' festivals
UK Census 2001	Christianity 72 % Non-Religious 15%
UK Census 2011	Christianity 59 % Non-Religious 26%
UK Census 2021	Christianity 46 % Non-Religious 37%
House of Lords	26 bishops influence UK law making
Evangelism	Telling others about Christianity with intention of converting.
Tearfund	Christian charity, aid relief and education
Persecution	Hostile and ill-treatment based on religion
Reconciliation	Restoring of friendly relations
World Wide Council	Ecumenical group working for peace & reconciliation

Religion and Philosophy

Religion & Philosophy GCSE 10. 2 Christian Practices –EXTENSION KNOWLEDGE

Topic 1: Worship & Prayer	
Charismatic	Emphasises the presence of the Holy Spirit in worship. *Signs* and *Wonders*
Tongues	Speaking in a heavenly language
'Baptism' of the spirit	Holy Spirit comes upon a person powerfully
'ACTS'	Adoration, Confession, Supplication, Confession
LORDS Prayer	Set Prayer taught by Jesus, Guides C on how to pray and is a trusted tradition

Topic 2: Sacraments and Pilgrimage	
Infant Baptism	Catholic & CoE - (child) water sprinkled on their head three ties (trinity). Light Candles, Oil of Chism, Holy Water, Font, Godparents.
Believers Baptism	Protestant/Evangelical - Full immersion, Testimony, Invite friends, symbolising death and resurrection
Eucharist	Trad: Consumed at Alter, Shared Cup, Modern: Consumed in seat, own cups
Memorialism	The bread and wine are symbolic acts of re-membrance and commitment (Protestant)
Consecrated	Set apart through priestly blessing
Ecumenical	Christians working together across denominations

Topic 3: Festivals	
Lent	Fast for 40 days to prove faith and test self-discipline. Remembers Jesus in the wilderness

Topic 4: The Church—Uk & Global	
Sources of Authority	Bible - Ultimate guide on Christian belief Tradition - Trusted ways of being through history Church Leaders - Responsible and trusted guides
Good Works	Serving the community
Fellowship	Mutually supportive community of believers
Diversity	'***Differences***' UK has many different faiths
Cultural Furniture	Influenced by Christianity 'behind the scenes'
Global Census	Christianity 32% Islam 24% Non-Rel: 16%
2050 Prediction	Christianity & Islam grow total share, in part due to birthrates in developing countries.
Mission	Evangelism & Good works (often abroad)
Open Doors	Charity working for the persecuted church

Science

SB4a – Evidence for human evolution

Word	Pronunciation	Meaning
Ardi		Nickname for a 4.4-million-year-old fossilised specimen of *Ardipithecus ramidus*.
binomial system	*by-**nO**-mee-al **sis**-tem*	System of naming organisms using two Latin words.
evolution	*e-vol-**oo**-shun*	A change in one or more characteristics of a population over a long period of time.
Lucy		Nickname for a 3.2-million-year-old fossilised specimen of *Australopithecus afarensis*.
species	***spee**-shees or **spee**-sees*	A group of organisms that can reproduce with each other to produce offspring that will also be able to reproduce. Organism names have two Latin words – the first is its genus and the second is its species.

SB4b – Darwin's theory

Word	Pronunciation	Meaning
ancestor	***an**-ses-ter*	An organism from which more recent organisms are descended.
antibiotic		Medicine that helps people recover from a bacterial infection by killing the pathogen.
competition	*com-pet-**ish**-un*	There is competition between organisms that need the same things as each other (such as food). We say that they 'compete' for those things.
genetic variation	*jen-**et**-ick vair-ee-**ay**-shun*	Differences between organisms caused by differences in genes and passed on to offspring by their parents through reproduction. Also called inherited variation.
natural selection		A process in which certain organisms are more likely to survive and reproduce than other members of the same species, because they possess certain genetic variations.
resistant		Unaffected or less affected by something.

SB4c Development of evolution theory

Word	Pronunciation	Meaning
pentadactyl limb	*pen-ta-**dak**-til **lim***	A limb that has five digits (fingers and thumbs). Amphibians, reptiles, birds and mammals share this characteristic.

SB4d – Classification

Word	Pronunciation	Meaning
classification		Sorting things into groups.
domain		The three main groups that organisms are now sorted into: Archaea, Bacteria and Eukarya.
genus		A group of similar organisms. The genus name is the first word in the scientific name for a species (the second word is the 'species name'). Different closely related species belong to the same genus.

Science

Word	Pronunciation	Meaning
kingdom		There are five kingdoms into which organisms are divided: plants, animals, fungi, protists and prokaryotes.
species	***spee**-shees or **spee**-sees*	A group of organisms that can reproduce with each other to produce offspring that will also be able to reproduce. Organism names have two Latin words – the first is its genus and the second is its species.

SB4e – Breeds and varieties

Word	Pronunciation	Meaning
artificial selection		When people choose organisms with certain characteristics and use only those ones for breeding.
breed		Group of animals of the same species that have characteristics that make them different to other members of the species.
disease resistance		Unaffected or less affected by a certain disease.
gene	***jeen***	Section of the long strand of DNA found in a chromosome, which often contains instructions for a protein.
genetic engineering		Altering the genome of an organism, often by adding genes from another species. Also called genetic modification.
genetically modified organism (GMO)		Organism that has been produced using genetic engineering.
genome	***jee**-nOhm*	All the DNA in an organism. Each body cell contains a copy of the genome.
GMO		Short for 'genetically modified organism'.
selective breeding		When humans choose an organism that has a certain characteristic and then breed more of these organisms, making that chosen characteristic more and more obvious.
variety		Group of plants of the same species that have characteristics that make them different to other members of the species.
yield		The amount of useful product that you can get from something.

SB4f Tissue culture

Word	Pronunciation	Meaning
callus		Small clump of unspecialised plant cells.
clone		Offspring that is genetically identical to its parent.
differentiate	*diff-er-**en**-she-ate*	When a cell becomes specialised for a particular function.
extinction	*ex-**tink**-shun*	When a species dies out.
reject (biology)		When the immune system attacks tissue and cells that it does not recognise.
stem cell		An unspecialised cell that continues to divide by mitosis to produce more stem cells and other cells that differentiate into specialised cells.

Science

Word	Pronunciation	Meaning
tissue culture		Growing tiny pieces of tissue or cells in or on a medium containing nutrients.
virus		A particle that can infect cells and cause the cells to make copies of the virus.

SB4g – Genes in agriculture and medicine

Word	Pronunciation	Meaning
allele	*a-**leel***	Most genes come in different versions, called alleles. So a gene for eye colour may have a version (allele) that can cause dark eyes and an allele that can cause pale eyes.
base		There are four substances called bases that help make up DNA, often shown by the letters A, C, G and T. Pairs of bases form 'links' between two 'spines' formed of phosphate groups and a type of sugar.
diabetes		Disease in which the body cannot control the blood glucose concentration at the correct level.
insulin	***in**-syu-lin*	The hormone that decreases blood glucose concentration. Used in the treatment of type 1 diabetes.
ligase	***lie**-gaze*	An enzyme that joins two DNA molecules together.
plasmid	***plaz**-mid*	A small loop of DNA found in the cytoplasm of bacteria.
recombinant DNA		DNA made by joining two sections of DNA together.
restriction enzyme		An enzyme that cuts DNA molecules into pieces.
sticky end		A short section of single-stranded DNA found at the end of a section of DNA that has been cut by a restriction enzyme.
type 1 diabetes		Type of diabetes in which the pancreas does not produce insulin.
vector		Anything that transfers material from one organism to another.

SB4h GM and agriculture

Word	Pronunciation	Meaning
Bt toxin		A natural insecticide made by the bacterium *Bacillus thuringiensis* that kills some kinds of caterpillar.
insecticide	*in-**sect**-iss-I'd*	A chemical substance used to kill insect pests of crops.
monoculture		A large area of one kind of crop.
pest		An animal that causes problems, such as by damaging crops.
resistance (biology)		Being unaffected or less affected by something.
strain		Bacteria of a species that are slightly different to other strains of the species.
yield	***yeeld***	The amount of useful product obtained from an organism.

Science

SB4i Biological control and fertilisers

Word	Pronunciation	Meaning
biological control		Using living organisms to kill problem organisms such as pests or weeds.
fertiliser		Substances that add plant nutrients to soil, such as artificial fertilisers containing nitrogen compounds, or manure (a natural fertiliser made from animal waste).
pollution	*poll-**oo**-shun*	Harm caused to the environment, for example by the addition of poisonous substances or by abnormally high amounts of a substance.
weeds		Plants that are growing where they are not wanted, and where they cause problems such as competing with crop plants for light, water and nutrients.

Science

SB5a Health and disease

Word	Pronunciation	Meaning
cause		A factor that, when it changes, makes something else change.
communicable disease		A disease caused by a pathogen that can be passed from an infected individual to others. Also called an infectious disease.
correlation		When two factors change in a similar pattern, we say they are correlated.
disease		Something that causes the body not to work properly.
health		A state of complete physical, social and mental well-being.
immune system	*im-**youn** **sis**-tem*	The system that helps protect the body from harm by diseases, especially communicable diseases.
lifestyle		The way we live, such as our diet, whether we smoke tobacco, and how much exercise we take. Lifestyle can affect whether we develop some diseases.
non-communicable disease		A disease that cannot be passed from individuals to those around them. Examples include inherited diseases and some diseases caused by lifestyle.
pathogen	***path**-o-jen*	A microorganism that causes a communicable disease.

SB5b Non-communicable diseases

Word	Pronunciation	Meaning
cirrhosis	*si-**rO**-sis*	A disease of the liver, often caused by drinking a large amount of ethanol (alcohol) over a long period of time.
deficiency disease	*def-**ish**-un-see*	A disease caused by a lack of a particular nutrient in the body, such as anaemia caused by a lack of iron.
drug		A substance that we take into the body, which affects how the body works.
genetic disorder		A disease caused by faulty alleles of our genes.
malnutrition	*mal-new-**trish**-un*	Health problems caused by a diet that contains too little or too much of one or more nutrients.

SB5c Cardiovascular disease

Word	Pronunciation	Meaning
body mass index (BMI)		An estimate of how healthy a person's mass is for their height.
cardiovascular disease	*car-dee-O-**vas**-kyoo-lar*	A disease in which the heart or circulatory system does not function properly.
heart attack		When the heart stops pumping properly due to a lack of oxygen reaching part of it.
obesity	*o-**bee**-sit-ee*	A condition in which someone is overweight for their height and has a BMI above 30.

Science

stent		A small mesh tube used to widen narrowed blood vessels and allow blood to flow more easily.
stroke		Death of brain cells caused by a lack of blood, due to a blockage in a blood vessel in the brain.
waist : hip (waist-to-hip) ratio		A measure of the amount of fat in the body, calculated by dividing the waist measurement by the hip measurement.

SB5d Pathogens

Word	Pronunciation	Meaning
AIDS (acquired immune deficiency syndrome)		When HIV has damaged a person's immune system, so they are more likely to get secondary infections.
chalara dieback	*cal-**ar**-ra*	A communicable disease of ash trees caused by a fungus. It produces lesions of the trunk and branches, and dieback of the top of the tree.
cholera	***col**-e-ra*	A communicable disease caused by a bacterium, which causes extreme diarrhoea.
diarrhoea	*dye-a-**ree**-a*	Loose or watery faeces.
haemorrhagic fever	*hem-or-**raj**-ik*	A disease that includes a fever (high body temperature) and internal bleeding, such as caused by the Ebola virus.
host		An individual or species that can be infected by a certain pathogen.
HIV (human immunodeficiency virus)		A virus that attacks white blood cells in the human immune system, often leading to AIDS.
malaria	*mal-**air**-ee-a*	A dangerous disease, caused by a protist, that causes serious fever, headaches and vomiting and can lead to death.
protist		A kingdom of eukaryotic and mainly single-celled organisms (also called 'protoctists').
secondary infection		An infection due to the immune system being weakened previously by a different pathogen.
tuberculosis (TB)	*tyoo-ber-cyoo-**lOw**-sis*	A communicable bacterial disease that infects the lungs.
ulcer	***ull**-ser*	A sore area in the stomach lining which can be caused by a bacterium.
virus		A microbe that multiplies by infecting a cell and taking over the cell's DNA copying processes. Virus particles have no cellular structure and so are not true organisms.
white blood cell		A type of blood cell that forms part of the body's defence system against disease.

Science

SB5e Spreading pathogens

Word	Pronunciation	Meaning
epidemic		When many people over a large area are infected with the same pathogen at the same time.
hygiene	***hy**-jean*	Keeping things clean, by removing or killing pathogens.
oral route		When something enters the body through the mouth.
vector	***vek**-tor*	Something that transfers things from one place to another.

SB5f Virus life cycles

Word	Pronunciation	Meaning
bacterial lawn plate		A nutrient agar plate covered in a thin film of bacteria.
capsid		The protein coat of a virus.
cross-sectional area (of a cylinder)		The area of a circle cut at right angles through a cylinder. It is calculated as πr^2, where r is the radius of the circle.
lysis	***lie**-sis*	When the cell membrane of a cell breaks open, releasing everything inside the cell.
lysogenic pathway	*lie-so-**jen**-ick*	The pathway in a virus life cycle where the virus genetic material inserts into the cell's genetic material and is replicated each time the cell divides.
lytic pathway	***lit**-tick*	The pathway where a virus enters a cell, takes over the cell's replication process to produce more viruses, and causes lysis of the cell as the new viruses are released.
nutrient agar		Agar containing nutrients; used for growing cells, such as in bacterial lawn plates.

SB5g Plant defences

Word	Pronunciation	Meaning
aseptic techniques		Techniques used to keep out unwanted microorganisms, such as out of cultures.
autoclave		Machine used to sterilise equipment and culture media using pressure and heat.
chemical defence		Use of chemical compounds to defend against attacks by pathogens, such as lysozyme and hydrochloric acid in humans, and poisons and insect repellents in plants.
cuticle		An outer covering that is not made of cells. Plants have a cuticle covering the leaves.
pest		Any unwanted organism, such as animals that damage crop plants.

Science

physical barrier		A barrier that makes it difficult for pathogens to get into the body, such as skin, mucus and cilia in animals, and cuticles and cell walls in plants.
symptom	***simp**-tom*	Something that is suffered when an organism is ill, such as pain, or is a sign of illness, such as a high temperature.

SB5h Plant diseases

Word	Pronunciation	Meaning
diagnosis		The identification of the cause of a problem.
distribution analysis		Looking at where damaged plants occur, to help identify the cause of damage.
lesion	***lee**-zshun*	An area of damage, such as the cracks in bark caused by chalara dieback fungus in ash trees.
yield (crop)	***yeeld***	The amount of the harvested part of a crop, such as grain from wheat.

SB5i Physical and chemical barriers

Word	Pronunciation	Meaning
chemical defence		The use of chemical compounds to defend against attacks. Examples include lysozyme and hydrochloric acid.
Chlamydia	*clam-**id**-ee-a*	A bacterium that causes a sexually transmitted infection.
ciliated cells		A cell that lines certain tubes in the body and has cilia on its surface.
hydrochloric acid		Acid produced by cells lining the stomach, of about pH 2, which destroys many pathogens in food and drink.
lysozyme		An enzyme produced in tears, saliva and mucus, which damages pathogens.
mucus	***myou**-kus*	A sticky substance secreted by cells that line many openings to the body.
physical barrier		A structure that stops something from entering a certain area. For example, the body has physical barriers, such as the skin, that stop microbes from getting inside the body.
screening		Tests on samples of body fluids to check if people have a certain condition, e.g. an STI.
sexually transmitted infection (STI)		A communicable disease that is passed from an infected person to an uninfected person during sexual activity.

Science - Combined

SB5j Immune system

Word	Pronunciation	Meaning
activate		To make active, such as when a lymphocyte is triggered by a pathogen to start dividing rapidly.
antibody		A protein produced by lymphocytes. It attaches to a specific antigen on a microorganism and helps to destroy it.
antigen		A protein on the surface of a cell. White blood cells are able to recognise pathogens because of their antigens.
herd immunity		When the majority of people in a group are immunised, which provides protection to the few who are not by reducing their chance of meeting an infected person.
immune	*im-**youn***	When a person does not fall ill after infection, because their immune system attacks and destroys the pathogen quickly.
immunisation	*im-youn-l-**zay**-shun*	Giving a vaccine that causes an immune response without the person becoming ill, and which will make the person immune to the pathogen.
lymphocyte	***lim**-fO-site*	A type of white blood cell that produces antibodies.
memory lymphocyte		A lymphocyte that remains in the blood for a long time after an infection or vaccination.
MMR		Stands for measles, mumps and rubella. The vaccine given to develop immunity to these diseases.
secondary response		A much more rapid, and larger, production of antibodies to a pathogen when it infects the body again.
vaccine	***vack**-seen*	A mixture containing weakened or inactive pathogens, or antigens from the pathogen. When put into the body it causes an immune response.

SB5k Antibiotics

Word	Pronunciation	Meaning
antibiotic	*an-ti-by-**ot**-ick*	A substance that, when inside the body, either kills bacteria or stops them growing.
clinical trial		Testing of a medicine on people.
colony		A cluster of microorganisms living closely together.
dose		The total amount of something received, such as of a medicine.
inhibit		To stop or slow down a process.
penicillin	*pen-i-**sill**-in*	The first kind of antibiotic. It was extracted from a mould (fungus).
pre-clinical testing		Testing a drug before it is tried on humans, including testing on cells or tissues and on other animals.

Science

resistance (to an antibiotic)		When a bacterium is no longer damaged by an antibiotic.
side effect		Unintended effect of a medicine, which may be harmful.

SB5l Monoclonal antibodies

Word	Pronunciation	Meaning
cancer cell		A cell that continues dividing uncontrollably, causing disease inside the body.
chemotherapy		Use of drugs to treat a disease, such as in the treatment of cancer.
clone		Offspring from asexual reproduction. All the cells in a clone are genetically identical to each other and to the parent's cells.
diagnosis		The identification of the cause of a problem.
hybridoma cell		A cell made by fusing a lymphocyte and a cancer cell.
monoclonal antibodies		Many identical antibodies.
PET scanner		A scanner used to identify the position of radioactive substances inside the body.
platelet		Cell fragments that are important in the clotting mechanism of the blood.
radiotherapy		Use of ionising radiation to treat diseases, such as to kill cancer cells.

Science

SC5a Ionic bonds

Word	Pronunciation	Meaning
anion	***an**-i-on*	Negatively charged ion.
bond		A force that holds some atoms tightly together.
cation	***cat**-i-on*	Positively charged ion.
electrostatic force		Force of attraction between oppositely charged particles, and force of repulsion between particles with the same charge.
ion		Atom or group of atoms with an electrical charge. Atoms become positively charged ions if they lose electrons and negatively charged if they gain electrons.
ionic bond		Strong electrostatic force of attraction between oppositely charged ions.

SC5b Ionic lattices

Word	Pronunciation	Meaning
crystals	***kris**-tals*	Solids that are made up of a regular repeated pattern of atoms, molecules or ions, which form fixed shapes with flat surfaces and sharp edges.
ionic compound		Substance containing ions, formed by the loss and gain of electrons between two or more elements.
lattice structure		Regular grid-like repeating arrangement of particles such as atoms, molecules or ions.
polyatomic ions		A group of atoms that have a positive or negative charge due to the loss or gain of electrons.

SC5c Properties of ionic compounds

Word	Pronunciation	Meaning
anode	*an-**ode***	The positive electrode.
aqueous solution	***a**-kwi-ous sol-**ution***	A solution in which water is the solvent.
cathode	*cath-**ode***	The negative electrode.

SC6a Covalent bonds

Word	Pronunciation	Meaning
covalent bond	*co-**vay**-lent*	The bond formed when a pair of electrons is shared between two atoms.
dot and cross diagram		Diagram, to explain what happens when a bond is formed, which uses dots and crosses to represent the electrons of different atoms.
double bond		The bond formed when two pairs of electrons are shared between the same two atoms.

Science

Word	Pronunciation	Meaning
electrostatic forces		Forces of attraction between oppositely charged particles, and forces of repulsion between particles with the same charge.
molecular		Referring to substances that are made up of molecules.
molecular formula		This shows the actual number of atoms of each element that combine to make a molecule of a substance.
molecule		A group of two or more atoms joined together by covalent bonds.
outer electron shell		The electron shell (or energy level that contains electrons) which is furthest away from the nucleus.
valency	***vay**-len-see*	The number of covalent bonds formed by an atom (or the charge number of the ion formed by an atom).

SC7a Molecular compounds

Word	Pronunciation	Meaning
bond		A force that holds some atoms tightly together.
compound		Contains atoms of more than one element chemically joined together with bonds.
covalent bond	*co-**vay**-lent*	The bond formed when a pair of electrons is shared between two atoms.
covalent, simple molecular structure		Two or more atoms covalently bonded together to form a distinct unit.
element		A simple substance, made up of only one type of atom.
intermolecular force		A weak force of attraction between molecules.
monomer		A small, simple molecule that can be joined in a chain to form a polymer.
poly(ethene)		A common polymer made of ethane monomers.
polymer		A long-chain molecule made by joining many smaller molecules (monomers) together.

SC7b Allotropes of carbon

Word	Pronunciation	Meaning
allotropes		Different structural forms of the same element.
covalent, giant molecular structure		Three dimensional lattice of carbon atoms linked by covalent bonds.
delocalised electron		An electron that is free to move and can carry an electrical current.
fullerene		A simple molecule in which each carbon atom is covalently bonded to three other carbon atoms, forming spheres or tube shapes.

Science

Word	Pronunciation	Meaning
graphene		An allotrope of carbon consisting of a sheet that is one atom thick, with atoms arranged in a honeycomb shape.
lubricant		A substance placed between two moving surfaces to reduce the friction between them.

SC7c Properties of metals

Word	Pronunciation	Meaning
electrical conductivity		Allowing electricity to pass through.
lattice	***latt**-iss*	An arrangement of many atoms or other particles that are bonded together in a fixed regular (grid-like) pattern.
malleable	***mal**-ee-uh-buhl*	A substance that can be hammered or rolled into shape without shattering.
metallic bonding		The type of bonding found in metals. We can think of it as positively charged ions in a 'sea' of negatively charged electrons.
metals		Any element that is shiny when polished, conducts heat and electricity well, is malleable and flexible and often has a high melting point.
non-metals		Any element that is not shiny, and does not conduct heat and electricity well.

Science

SC8a Acids, alkalis and indicators

Word	Pronunciation	Meaning
acid	***ass**-id*	A solution with a pH of less than 7 and that contains an excess of hydrogen (H^+) ions. Acids turn litmus red.
acidic		Containing or having the properties of an acid. (adjective)
acidity		The amount of acid in a solution.
alkali	***alk**-al-lie*	A solution with a pH of more than 7 and that contains an excess of hydroxide (OH^-) ions. Alkalis turn litmus blue.
alkaline		Having a pH of more than 7.
alkalinity		The amount of alkali in a solution.
aqueous solution	***a**-kwee-us*	A solution with water as the solvent.
concentration	*con-sen-**tray**-shun*	A measure of how much solute is dissolved in a solvent such as water. (Units g dm^{-3} or mol dm^{-3})
indicator		A substance that changes colour depending on the pH of a solution.
neutral	***new**-tral*	A substance that is neither an acid nor an alkali. Neutral solutions have a pH of 7 and the same concentrations of hydrogen (H^+) and (OH^-) ions.
pH scale		A numerical scale up to 14 that measures the acidity or alkalinity of a solution based on the concentrations of hydrogen (H^+) and (OH^-) ions.
universal indicator		An indicator, containing a mixture of different pH indicators, designed to produce a range of colours depending on the pH.

SC8b Looking at acids

Word	Pronunciation	Meaning
concentrated	***con**-sen-tray-ted*	Containing a large amount of solute dissolved in a small volume of solvent.
dilute	*dYe-**loot***	Containing a small amount of solute dissolved in a large volume of solvent.
dissociate	*dih-**sOh**-shee-ayt* *OR dih-**sOh**-see-ayt*	To split up or separate into different parts. For example, acid molecules dissociate into H^+ ions and negative ions when they dissolve in water.
pH meter		Electronic device used to measure the pH of a solution.
strong acid		An acidic solute that dissociates completely into ions when it dissolves.
weak acid		An acidic solute that does not dissociate completely into ions when it dissolves.

Science

SC8c Bases and salts

Word	Pronunciation	Meaning
base		Any substance, soluble or insoluble, that neutralises an acid, forming a salt and water only.
crystallisation	*cris-tal-l-**zay**-shun*	The process of forming crystals.
filter (verb)		To remove or separate a solid from a liquid by passing the mixture through a porous material.
neutralise (verb)	***new**-trall-eyes*	To make a solution neither acidic nor alkaline. During neutralisation a base reacts with an acid, forming a salt and water.
salt		An ionic compound produced by a neutralisation reaction.
state symbols		Standard set of symbols written after chemical formulae to indicate the state of a substance. These are: solid (s), liquid (l), gas (g) and dissolved in water (aq)

SC8d Alkalis and balancing equations

Word	Pronunciation	Meaning
alkali	***alk**-al-lie*	A solution with a pH of more than 7 and that contains an excess of hydroxide (OH^-) ions. Alkalis turn litmus blue. A soluble base.
balanced equation	*eck-**way**-shun*	A way of writing out what happens in a chemical reaction using symbols to represent the substances involved.

SC8e Alkalis and neutralisation

Word	Pronunciation	Meaning
burette	*b'your-**ett***	Apparatus used to accurately measure the volume of solution that has been added during a titration.
end-point		In a titration, when just enough solution has been added from the burette to react with all the solution in the flask.
pipette	*pip-**ett***	Apparatus used to accurately measure a set volume of a solution, which can be used in a titration.
titration	*tie-**tray**-shun*	Method used to mix acids and alkalis in the correct proportions to produce a solution containing only salt and water. It can be used to find the concentration of an acid or an alkali.

Science

SC8f Reactions of acids with metals and carbonates

Word	Pronunciation	Meaning
effervescence	*eff-er-**ves**-ens*	Fizzing or a stream of bubbles produced during a reaction.
half equation		A balanced equation, including electrons, that shows what happens to one substance during a redox reaction.
ionic equation		A balanced equation that only shows the ions that react together. The spectator ions are not included in the equation.
oxidation	*ox-id-**ay**-shun*	A reaction in which a substance gains oxygen or in which an atom or ion loses electrons.
reactivity series		A list of metals in order of reactivity with the most reactive at the top.
reduction	*re-**duk**-shun*	A reaction in which a substance loses oxygen or in which an atom or ion gains electrons.
spectator ions		These are ions that do not change during a reaction.

SC8g Solubility

Word	Pronunciation	Meaning
precipitate	*pre-**sip**-et-tate*	An insoluble product formed when solutions of two soluble reactants are mixed.
precipitation	*pre-sip-et-**tay**-shun*	A reaction in which an insoluble product is formed from two soluble reactants in solution.

SC9a Masses and empirical formulae

Word	Pronunciation	Meaning
empirical formula	*em-**pir**-ical formula*	The formula showing the simplest whole number ratio of atoms of each element in a compound.
molecular formula	*mol-**ec**-ular formula*	The formula showing the actual number of atoms of each element in a molecule of a compound.
relative formula mass		The sum of the relative atomic masses of all the atoms in a formula.

Science

SC9b Conservation of mass

Word	Pronunciation	Meaning
concentration	*con-cen-**tray**-shion*	The amount of a solute dissolved in a certain volume of solvent.
solute	***sol**-ute*	A substance that dissolves in a liquid to make a solution.
solvent	***sol**-vent*	Describes the liquid in which a substance dissolves to make a solution.
precipitate		An insoluble substance that is formed when two soluble substances react together in solution.
closed system		When substances cannot enter or leave an observed environment, e.g. a stoppered test tube.
law of conservation of mass		The idea that mass is never lost or gained during a chemical reaction or physical change.
non-enclosed system		When substances can enter or leave an observed environment e.g. stoppered test tube

SC9c Moles

Word	Pronunciation	Meaning
Avogadro constant	*Avo-**gadro***	This is the number of particles in one mole of a substance (6.02×10^{23} mol^{-1}).
limiting reactant		The reactant that determines the amount of product formed in a chemical reaction. Any other reactants will be present in excess.
mole		The mass of a mole of a substance is the relative formula mass expressed in grams.
stoichiometry	*stoi-key-**om**-etry*	The molar ratio of the reactants and products in a chemical reaction.

SC10a Electrolysis

Word	Pronunciation	Meaning
anion	***an**-I-on*	A negatively charged ion, formed by gaining electrons (usually a non-metal ion).
anode		Positive electrode.
cathode		Negative electrode.
cation	***cat**-I-on*	A positively charged ion formed by losing electrons.
electrode		A rod made of a metal or graphite that carries the current into or out of the electrolyte.
electrolysis	*e-lek-**trol**-is-is*	The process in which energy transferred by a direct electrical current decomposes electrolytes.
electrolyte	*e-**lek**-trO-lite*	An ionic compound that is molten or dissolved in water.
half equation		An ionic equation showing the electrons gained or lost in oxidation or reduction reactions.
oxidation	*ox-id-**ay**-shun*	A reaction in which oxygen is added to a chemical substance; loss of electrons by an atom or negative ion.
reduction	*re-**duck**-shun*	A reaction in which oxygen is lost by a chemical substance; gain of electrons by an atom or negative ion.

Science

SC10b Products from electrolysis

Word	Pronunciation	Meaning
discharged	*dis-**charged***	In electrolysis, an ion is discharged when it gains or loses electrons to form a neutral atom or molecule.
inert		An electrode that is unreactive, such as graphite or platinum.

SC11a Reactivity

Word	Pronunciation	Meaning
cation	***cat**-I-on*	Ion with one or more positive charges.
displacement reaction		A reaction where a more reactive element takes the place of a less reactive element in a compound.
half equation		Ionic equation showing electron transfers in oxidation or reduction.
oxidation	*ox-id-**ay**-shun*	A reaction in which a substance gains oxygen or loses electrons.
reactivity series		A list of metals in order of reactivity with the most reactive at the top.
redox reaction		A reaction in which oxidation and reduction take place.
reduction	*re-**duck**-shun*	A reaction in which a substance loses oxygen or gains electrons.
spectator ions		Ions that do not change during a reaction.

SC11b Ores

Word	Pronunciation	Meaning
bioleaching	***By**-Oh-leech-ing*	Using bacteria to extract metals from their ores.
electrolysis	*e-lek-**trol**-is-is*	A process in which electrical energy from a direct current supply decomposes electrolytes.
extraction		A process in which a metal is obtained from its ore.
leachate	***leech**-ate*	A solution produced when water or another solvent passes through a mixture of substances and dissolves some of them.
native state		A metal that occurs uncombined with any other element.
ore		A rock that contains a high concentration of a metal or metal compound.
phytoextraction	*fye-tow-ex-**track**-shun*	Using plants to extract metals from their ores.

SC11c Oxidation and reduction

Word	Pronunciation	Meaning
corrosion	*cor-**Oh**-shun*	A reaction in which a metal reacts with air and sometimes water to form a metal oxide or hydroxide.
oxidation	*ox-id-**ay**-shun*	A reaction in which a substance gains oxygen or loses electrons.
redox		A reaction in which reduction and oxidation take place.
reduction	*re-**duck**-shun*	A reaction in which a substance loses oxygen or gains electrons.

Science

rusting		The reaction between iron, air and water to form hydrated iron(III) oxide (rust).
tarnish		A dull film on a metal's surface.

SC11d Life cycle assessment and recycling

Word	Pronunciation	Meaning
life cycle assessment (LCA)		A technique used to assess the environmental impact associated with all the stages in the life of a product from cradle to grave.
recycling		Converting waste materials into new products.

SC12a Dynamic equilibrium

Word	Pronunciation	Meaning
closed system		When substances cannot enter or leave an observed environment, e.g. a stoppered test tube.
dynamic equilibrium		When the forwards and backwards reactions in a reversible chemical reaction are occurring at the same rate.
endothermic		A type of reaction in which energy from the surroundings is transferred to the products, e.g. photosynthesis.
exothermic		A type of reaction in which energy is transferred to the surroundings from the reactants, e.g. combustion.
open system		A system into or from which substances can enter or leave, such as a reaction inside an open test tube.
reversible reaction		A chemical reaction that can work in both directions.

SC13a Transition metals

Word	Pronunciation	Meaning
catalyst	***cat***-*a-list*	A substance that speeds up a process, without itself being used up.
ductile	***duk***-*tile*	A substance that can be stretched out to make a thin wire.
malleable	***mal***-*ee-uh-buhl*	A substance that can be hammered or rolled into shape without shattering.
transition metal	*tran-**zi**-shun **met**-al*	Metal element in the block between groups 2 and 3 in the periodic table.

SC13b Corrosion

Word	Pronunciation	Meaning
corrosion	*kuh-**rOh**-zshun*	The gradual deterioration of a substance when it reacts with substances in the environment, for example when a metal oxidises in air.
desiccant		A substance that absorbs water or water vapour.
oxidise		To gain oxygen in a chemical reaction, or to lose electrons.
rusting		The corrosion of iron or steel. (Water and oxygen must be present for rusting to occur.)
sacrificial protection		Using a more reactive metal to protect iron from rusting.
tarnish		A thin layer that forms on a metal due to oxidation. A metal is also said to tarnish as this layer forms.

Science

SC13c Electroplating

Word	Pronunciation	Meaning
anode	***an**-ode*	The positive electrode.
cathode	***cath**-ode*	The negative electrode.
electrolyte	*e-**lek**-trO-lyte*	An ionic compound that is molten or dissolved in water.
electroplating		Using electricity to coat one metal with a thin layer of another metal.
galvanising	***gal**-van-eYe-zing*	Coating iron or steel with a thin layer of zinc to improve its resistance to rusting.

SC13d Alloying

Word	Pronunciation	Meaning
alloy	***al**-oi*	A metal with one or more other elements (usually metals) added to improve its properties.
alloy steel	***al**-oi **steel***	Iron with other elements added to make an alloy.
stainless steel		Alloy steel containing elements such as chromium, to resist rusting.

SC13e Uses of metals and their alloys

Word	Pronunciation	Meaning
ductile	***duk**-tile*	A substance that can be stretched to make a thin wire.
malleable	***mal**-ee-uh-buhl*	A substance that can be hammered or rolled into shape without shattering.

Science

SP6a Atomic models

Word	Pronunciation	Meaning
alpha particle		A particle made of two protons and two neutrons, emitted as ionising radiation from some radioactive isotopes.
atom		The smallest neutral part of an element that can take part in chemical reactions.
electron		A tiny particle with a negative charge and very little mass.
element		A simple substance made up of only one type of atom.
kinetic theory		The model that explains the properties of different states of matter in terms of the movement of particles.
nucleus		The central part of an atom or ion.
particle theory		Another term for kinetic theory.
subatomic particle		A particle that is smaller than an atom, such as a proton, neutron or electron.

SP6b Inside atoms

Word	Pronunciation	Meaning
atomic number		The number of protons in the nucleus of an atom. It is also known as the proton number.
isotope		Atoms of an element with the same number of protons (atomic number) but different mass numbers due to different numbers of neutrons.
mass number		The total number of protons and neutrons in the nucleus of an atom. It is also known as the nucleon number.
neutron		A particle found in the nucleus of an atom having zero charge and mass of 1 (relative to a proton).
nucleon		A particle found in the nucleus (neutron or proton).
nucleon number		Another term for mass number.
proton		A particle found in the nucleus of an atom, having a positive charge and the same mass as a neutron.
proton number		The number of protons in an atomic nucleus. Another term for atomic number.
relative mass		The mass of something compared to the mass of something else which is often given the mass of 1.

Science

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nucleon		A particle found in the nucleus (neutron or proton).
nucleon number		Another term for mass number.
proton		A particle found in the nucleus of an atom, having a positive charge and the same mass as a neutron.
proton number		The number of protons in an atomic nucleus. Another term for atomic number.
relative mass		The mass of something compared to the mass of something else which is often given the mass of 1.

Science

SP6c Electrons and orbits

Word	Pronunciation	Meaning
absorption spectrum		A spectrum of light (or other electromagnetic radiation) that includes black lines. These are caused by some wavelengths being absorbed by the materials that the light (or radiation) passes through.
electromagnetic radiation		A form of energy transfer, including radio waves, microwaves, infrared, visible light, ultraviolet, X-rays and gamma rays.
electron shell		Area around a nucleus that can be occupied by electrons. Shells are usually drawn as circles. Also called an electron energy level or an orbit.
electronic configuration	*el-eck-**tron**-ik con-fig-your-**ay**-shun*	The arrangement of electrons in shells around the nucleus of an atom.
emission spectrum	*em-**ish**-un **spek**-trum*	A set of wavelengths of light or other electromagnetic radiation showing which wavelengths have been given out (emitted) by a substance.
ion	***I**-on-eyes-ing ray-dee-**ay**-shun*	An atom or group of atoms with an electrical charge due to the gain or loss of electrons.
ionising radiation		Radiation that can cause charged particles (ions) to be formed. It can cause tissue damage and DNA mutations.
orbit		A word used to describe the way electrons move around the nucleus of an atom.
positive ion		An atom that has lost electrons and so has an overall positive charge.
visible light		Electromagnetic waves that can be detected by the human eye.
visible spectrum		The part of the electromagnetic spectrum that can be detected by our eyes.
wavelength		The distance between a point on one wave and the same point on the next wave.

SP6d Background radiation

Word	Pronunciation	Meaning
background radiation		Ionising radiation that is around us all the time from a number of sources. Some background radiation is naturally occurring, but some comes from human activities.
cosmic rays		Charged particles with a high energy that come from stars, neutron stars, black holes and supernovae.
count rate		The number of alpha or beta particles or gamma rays detected by a Geiger–Müller tube in a certain time.
dose		The amount received at one time – for example, the amount of radiation a person receives.
Geiger–Müller (GM) tube	***guy**-ger **moul**-er **tyoob***	A device that can detect ionising radiation and is used to measure the activity of a radioactive source.

Science

SP6e Types of radiation

Word	Pronunciation	Meaning
alpha particle		A particle made of two protons and two neutrons, emitted as ionising radiation from some radioactive isotopes.
beta particle		A particle of radiation emitted from the nucleus of a radioactive atom when it decays. It is an electron.
decay (radioactive)		When an unstable nucleus changes by giving out ionising radiation to become more stable.
gamma ray		A high-frequency electromagnetic wave emitted from the nucleus of a radioactive atom.
penetrate		To go through.
positron		The anti-particle of an electron, having the same mass but opposite charge. Positron emission is a type of beta decay.
random		Any process that cannot be predicted and can happen at any time is said to be random.
unstable		An unstable nucleus in an atom is one that will decay and give out ionising radiation.

SP6f Radioactive decay

Word	Pronunciation	Meaning
nuclear equation		An equation representing a change in an atomic nucleus due to radioactive decay. The atomic numbers and mass numbers must balance.

SP6g Half-life

Word	Pronunciation	Meaning
activity		The number of emissions of ionising radiation from a sample in a given time. Activity is usually given in becquerels (Bq).
becquerel (Bq)	***beck****-er-ell*	The units for the activity of a radioactive object. One becquerel is one radioactive decay per second.
half-life		The average time taken for half of the radioactive nuclei in a sample of radioactive material to have decayed. It is also the time taken for the activity of a source to fall to half its value.
probability		The likelihood of an event happening. It can be shown as a fraction from 0 to 1, a decimal from 0 to 1, or a percentage from 0 to 100 per cent.

Science

SP6h Using radioactivity

Word	Pronunciation	Meaning
irradiate		To expose something to ionising radiation (e.g. in order to sterilise food or medical equipment with gamma rays).
sterilise	***ste**-rill-eyes*	To destroy microorganisms (e.g. bacteria, viruses and fungi) in or on an object. It can be carried out using radioactive sources.
tracer	***tray**-ser*	A radioactive substance that is deliberately injected into the body or into moving water. It allows the movement of the substance to be followed by detecting the ionising radiation emitted.

SP6i Dangers of radioactivity

Word	Pronunciation	Meaning
contaminate		An unwanted addition that makes something unsuitable or impure, e.g. a person may be contaminated with a radioactive substance.
mutation		A change to a gene caused by a mistake in copying the DNA base pairs during cell division, or by the effects of radiation or certain chemicals.

SP6j Radioactivity in medicine

Word	Pronunciation	Meaning
external radiotherapy		Treatment of cancer by sending radiation into the body from outside.
gamma camera		A camera that detects gamma rays.
internal radiotherapy		Treatment of cancer by putting a radioactive source inside the body.
PET scanner		A medical scanning technique that detects gamma rays caused by the interaction of a positron from a radioactive source with an electron.
tumour		A lump formed of cancer cells.

SP6k Nuclear energy

Word	Pronunciation	Meaning
climate change		Changes that will happen to the weather as a result of global warming, which is caused by the increase in the amount of carbon dioxide in the atmosphere.
decommission		To dismantle safely.
fossil fuel		A fuel formed from the dead remains of organisms over millions of years (e.g. coal, oil or natural gas).
non-renewable		Any energy resource that will run out because it cannot be renewed, such as oil.
nuclear fission	***fish**-un*	The reaction in which the nucleus of a large atom, such as uranium, splits into two smaller nuclei.

Science

Word	Pronunciation	Meaning
nuclear fusion	***few-****zshun*	The reaction in which nuclei of light atoms, such as hydrogen, combine to make the nucleus of a heavier atom.

SP6l Nuclear fission

Word	Pronunciation	Meaning
chain reaction		The sequence of reactions produced when a nuclear fission reaction triggers one or more further fissions.
control rod		A rod that can be lowered into the core of a nuclear reactor to absorb neutrons and slow down the nuclear chain reaction.
core		The innermost part of something.
daughter nucleus		A nucleus produced when the nucleus of an unstable atom splits into two during fission or when a radioactive nucleus decays by emitting an alpha or beta particle.
fuel rod		A rod containing the nuclear fuel for a nuclear reactor.
moderator		A substance in a nuclear reactor that slows down neutrons, so that the nuclear fuel can absorb them more easily.

SP6m Nuclear fusion

Word	Pronunciation	Meaning
electrostatic repulsion		A force between two electrical charges that have the same sign, which pushes them apart.

Statistics
2b: Continuous data

Histogram

- A **histogram** is similar to a bar chart but, because the data is continuous, there are no gaps between the bars.

H

- To draw a **histogram for unequal class intervals**, adjust the height of the bars so the **area** of the bar represents the frequency. The height of each bar represents the **frequency density**.
- Frequency density = $\frac{\text{frequency}}{\text{class width}}$
- You can compare data from histograms if they have the same class intervals and the same frequency density scales.

Frequency polygons

- A **frequency polygon** joins the midpoints of the tops of the bars of a histogram with straight lines. A frequency polygon may be drawn with or without a histogram.

Cumulative frequency

- **Cumulative frequency** is the running total of the frequencies from each class interval.
- For discrete data, you can draw a **cumulative frequency step polygon**. Plot the cumulative frequencies against the upper class boundaries. Join the steps with straight lines.
- For grouped continuous data, you can draw a **cumulative frequency diagram**. Plot the cumulative frequencies against the upper class boundaries. Join the points with a smooth curve or straight lines.
- Cumulative frequency diagrams can be used to estimate or predict other values.

Distributions

- The **shape of a distribution** is the shape formed by the bars in a histogram, or by a frequency polygon, or by the rows of a stem and leaf diagram.
- A **distribution** can be **symmetrical**, or have **positive skew** or **negative skew**.

Misleading diagrams

- **Three-dimensional diagrams** make comparisons difficult as data proportions appear distorted.
- Diagrams without clear scales, labels or keys may be misleading.

Statistics
3a: Measures of central tendency

Averages

- When the number of data values, $\boldsymbol{n}$, is odd the **median** is the value of the $\frac{1}{2}(\boldsymbol{n}+1)$**th** observation. When $\boldsymbol{n}$ is even, the median is the mean of the two middle values.
- **Mean** $= \bar{x} = \frac{\sum x}{n}$
  - $\bar{x}$ is the mean of all the x values.
  - $\sum x$ is the sum of all the x values.
- The **mode** is the data item with the highest frequency.
- The data in a frequency table is written in order. The median is the $\frac{1}{2}(n+1)$th value.
- The **modal class** is the class with the highest frequency.
- For grouped continuous data, or for large data sets, the median is the $\frac{1}{2}n$th value.
- For grouped data, estimated median $= L + \frac{\frac{n}{2} - F}{f} \times w$ where:
  - L is the lower boundary of the class containing the median
  - n is the total number of values
  - F is the cumulative frequency of the intervals before the one containing the median
  - f is the frequency of the median class interval
  - w is the width of the median class interval.
- When all the data values are increased (or decreased) by the same amount or percentage, the averages are increased (or decreased) by the same amount or percentage.