



AUTUMM KNOWLEDGE ORGANISER

YEAR 7

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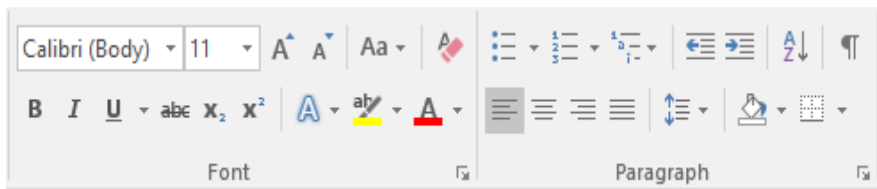
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Computer Science Knowledge Organiser



Year 7 Using media



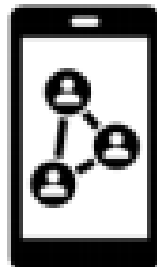
Formatting can be using tools like **bold**, *italic*, underline, changing colour, font style and size, alignment and many more.

Formatting can be used for many reasons. Including to make text easier to read, easier for the audience to use, highlight important information or attract attention.

It is important to select the appropriate formatting for the audience!

Images play an important role when using software. It is important that **appropriate** images are used, ones that meet the requirements of the **audience** and the **purpose** of whatever is being created.

A **blog** is a regularly updated website or web page, typically one run by an individual or small group, that is written in an informal or conversational style.



Is it real? Is it true?



When researching and reading stories online you need to check that they are **reliable**, **trustworthy** and **credible**. Anyone can upload content so it is not always accurate.

- Check the source, find out which other sources are reporting it
- Check whether other sites are saying the same thing.
- Don't trust all the stories and all pictures
- Check for facts not rumours
- Check any citations or references

When you are researching a topic you will come across a lot of useful information. Once the reliability and accuracy has been checked you may decide to use the information. Check the law

Plagiarism using someone else's work or ideas and using them as if they were your own. This can be any type of work either printed or electronic.

Citation the audience where the information came from. Anything that is used needs to have **citations** or **references** to the original work. the audience details about the source so that they can see that the source is relevant and recognised so they can find the source themselves if they want to.

It is the law



Copyright Law gives the creators of literary, dramatic, musical, artistic works, sound recordings, broadcasts, films and typographical arrangement of published editions, rights to control the ways in which their material may be used.



Creative Commons(CC) license is one type of copyright license. This allows the copyright owner to say exactly what other people can and can't do with or to their work.



They help copyright owners share their work while keeping the copyright. For example, a Creative Commons licence might allow other people to copy and distribute the copyright owner's work, if they give them credit.

Keywords

Format

Source

Licensing

Audience

Plagiarism

Copyright

Citation

Blog

Credibility

Referencing

Appropriate



Computer Science Knowledge Organiser

YEAR 7 MODELLING DATA

SPREADSHEETS

Spreadsheets are used to model data.
That means that they can be used to perform calculations on data and make predicts.

Data and information are not the same.

- **Data:** facts and figures in their raw form
- **Information:** data that has been given structure or meaning

For example:

Data—10, 2107, 18

Information—Time 10am, date 21st July, temperature 18°

The tool bar ribbon at the top allows for **formatting** of the data. Changing colour, size, style etc

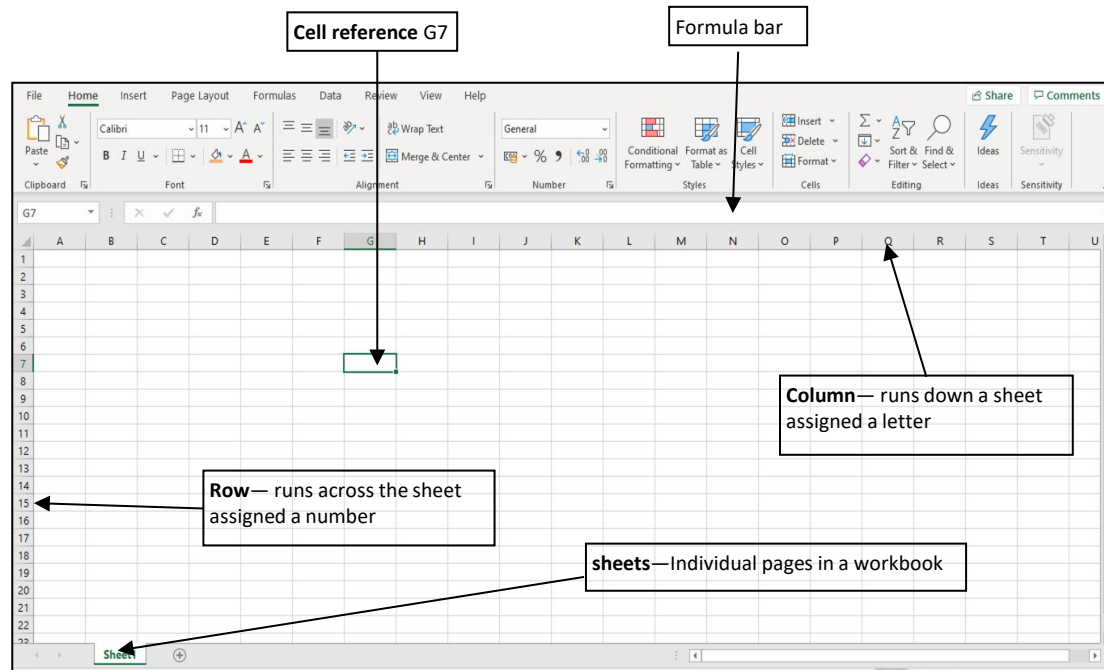
There is a **sort** and **filter** tool that allows for data to be arranged in ways that is most useful for the user e.g. alphabetical, highest, lowest etc.

Conditional formatting can be set to allow the cell **formatting** to **automatically** change if certain criteria is met. For example a cell might turn red if there was a negative number

In order to complete calculations spreadsheets make use of **formula**.

A formula uses the following basic symbols
The = symbol is always at the start of a formula
The + symbol is used for addition
The - symbol is used for subtraction
The * symbol is used for multiply
The / symbol is used for divide

Functions are also used which are predefined formula.



Common **functions** are

SUM—adds a range of cells

MAX—returns the largest value from selected cells

MIN—returns the smallest value from selected cells

AVERAGE—provides the arithmetic mean (average) of selected cells

COUNTIF—counts the number of cells in a range that meet the given criteria

IF— allows logical comparisons

COUNTA—counts cells that are not empty

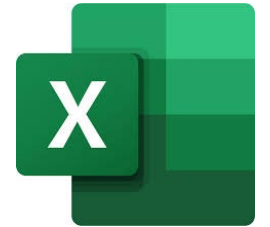
Data can be gathered from different sources

- **Primary** source: collecting data yourself
- **Secondary** source: someone else collects the data

Each box on a spreadsheet is called a **cell** and they hold data.

Each **cell** has a unique **cell reference** to identify its location.

You can fill data automatically by using AutoFill

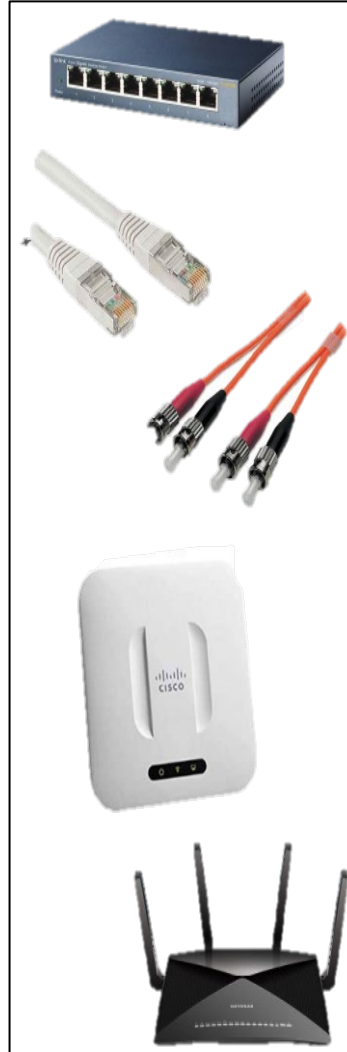




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Year 7 Networks

Key Words	
Bandwidth	Amount of data that can be moved from one point to another in a given time.
Buffering	Data arriving slower than it is being processed
Internet	A worldwide network of computers
internet of Things (IoT)	Takes everyday 'things' and connects them to the Internet e.g. smart light bulb, fridge, heating etc.
IP address	A unique address for every device on the internet
Packet	Networks send/receive messages in units called packets
Protocol	All methods of communication need rules in place in order to pass on the message successfully. These sets of rules are called 'protocols'
Search Engine	A website that allows user to look up information on WWW e.g. Bing, Google etc.
Web browser	Piece of software(code) used to view information on the Internet
WWW	Part of the Internet that contains websites and webpages. NOT the same as the Internet.



A **network** is where devices are connected together usually by cable or Wi-Fi. This could be a few computers in a room, many computers in a building or lots of computers across the world.

Wired and Wireless data transmission

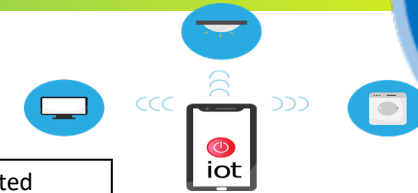
A computer network can be either wired or wireless.

- Wired networks send data along cables.
- Wireless networks send data through the air using radio waves.



Bandwidth—Bandwidth is the amount of data that can be moved from one point to another in a given time. Higher bandwidth = more data per second

Bandwidth is measured in bits per second
A bit is the smallest unit of data
Data transfer rates are now so good that bandwidth is usually measured in Megabits per second (Mbps)
1Mb—1 million bits



Internet services

There are a range of services provided by the internet. These include:

- World Wide Web
- Email
- Online gaming
- Instant messaging
- Voice over IP (VoIP) – audio calls
- Internet of Things (IoT)
- Media streaming (e.g. watching Netflix online)

The rules for each service are different. As a result, a different protocol is used.

HTTP—HyperText Transfer Protocol—used so that data can be understood when sent between web browsers and servers.
HTTPS—is the secure version of HTTP where data sent is encrypted.

Network Hardware—physical equipment required to set up a network
Hub—Connects a number of computers together. Ports allow cables to be plugged in from each connected computer.
Router—Used to connect two separate networks together across the internet
Server—A powerful computer which provides services to a network
Cable—Used to connect different devices together. They are often made up of a number of wires.



Computer Science Knowledge Organiser



PROGRAMMING 1 - SCRATCH

Scratch is a **block based programming language**. We can use predefined code drag and drop blocks to create a sequence of code.

Key Words	
Abstraction	Identify the important aspects to start with
Algorithm	Precise sequence of instructions
Computational thinking	Solving problems with or without a computer
Debugging	Looking at where a program might have errors or can be improved
Blocks	Scratch bricks that we can use to code algorithms
Decomposition	Breaking down a problem into smaller parts
Execute	A computer precisely runs through the instructions
Iteration	Doing the same thing more than once
Selection	Making choices
Sequence	Running instructions in order
Variable	Data being stored by the computer

A computer inputs (this might be automatic or via human input), processes that input and then produces an output. as well as producing an output. For example when you use a keyboard and mouse, the mouse is used to input data into the computer to be processed and the output is visible on the computer monitor.

Sequence, selection and iteration are all processes. In order for computers to perform tasks there is more that is needed. For example a computer will take an **input** (this might be automatic or via human input) which the computer will then **process** and the **output** will be visible on the computer monitor.

Operators

Comparison operators allow us to compare using $<$ $>$ $+$
Logical operators use **AND, OR, NOT**

Variables are used to store data for use in a program. They can store lots of different types of data such as names and scores.
So set variable score to equal 0
If I score a goal then increase variable by 1

Count controlled iteration will execute the commands a set number of times. Example: "perform 200 star jumps"

Condition-controlled iteration will execute the commands until the condition you set is no longer being met. Example: "perform star jumps until 3pm"

We use algorithms in every day life . Example an algorithm to get to school, to make a cup of tea, to make a pizza, to order a takeaway. These are just precise sequences of instructions.

A **selection** statement in programming allows a computer to **evaluate** an **expression** to 'true' or 'false' and then perform an action depending on the outcome.



SCRATCH





Computer Science Knowledge Organiser



DIGITAL SKILLS

IMPACT OF TECHNOLOGY

Cyberbullying is similar to bullying but tends to occur online. Cyberbullying can come in many forms. Some examples are:

- Threatening someone to make them feel scared
- Harassing someone by repeatedly sending them messages
- Ruining somebody's reputation
- Excluding someone from a group
- Stealing someone's identity and pretending to be them
- Publicly displaying private images or messages



Social media settings

- Profiles should always be set to private
- Profile images should not reveal locations
- Profile images should not be easy to recognise; it is much better to use a picture of a pet or a cartoon character
- Don't reveal locations — this makes it easy to find out where you are.
- Making your date of birth public makes it easy for hackers to steal your personal information and set up fake accounts in your name.
- You should never reveal your phone number, email address, or home address on a public site
- You should never reveal your current location on social media
- Putting your full name, including a middle name, makes it easy for someone to steal your personal information. Always use a nickname or shortened version of your name

STOP cyberbullying

PASSWORDS are like underpants



Never share them



Change them often



Keep them Private

Do you really want to send that?

Think before you click.

It is easy to send comments from the other side of a screen.

It is not easy to then remove them.

Actions need to be considered before mistakes are made.

Using technology appropriately, carefully and positively leads to positive digital citizens.

Digital citizenship is the responsible use of technology by anyone who uses computers, the Internet and digital devices to engage with society on any level.

Secure passwords

No one should be able to guess/work out your password.

Current government advice is to use 3 random words

Where to get help

Talk to a trusted adult

<https://www.ceop.police.uk/>

<https://www.childline.org.uk/>

Key Words	
Audience	The people you are communicating, presenting information to
Catfishing	A person pretends to be someone they are not.
Collaboration	Working effectively together
Digital tattoo/Digital footprint	Online reputation that is permanent
Email	A tool for online communication
Hazards	Areas/items that could cause damage or injury
Network	Devices are connected together usually by cable or Wi-Fi.
Password	A way to ensure no one access your data or information
Respect	Be mindful of how you are responding to others
Secure	Making sure your online information is safe

Design and Technology: Design skills

Literacy / key words

Rendering

Rendering with colour pencils involves layering and blending colours to create detailed, textured, and realistic illustrations or designs.

Oblique drawing

Oblique drawing is a way to make a 3D picture where the front looks normal, and the sides are drawn at an angle to show depth.

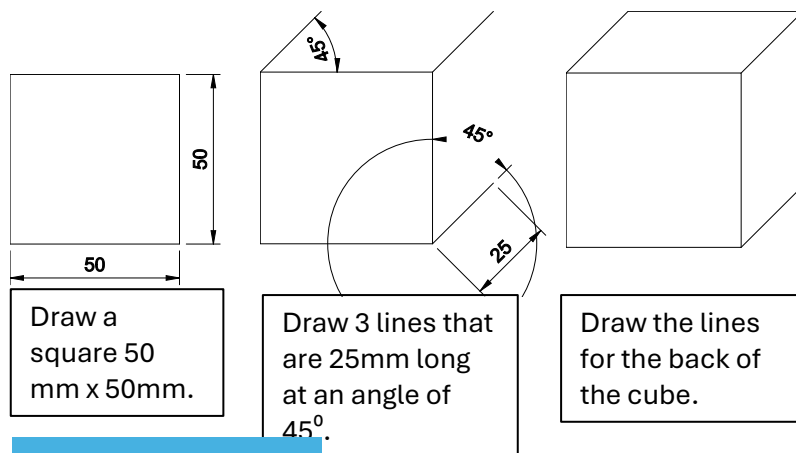
Isometric drawing

Isometric drawing is a way to make 3D pictures where all sides are drawn at equal angles, showing depth clearly.

1 point perspective

1-point perspective drawing is a technique where all lines meet at a single vanishing point on the horizon, creating depth.

Oblique drawing

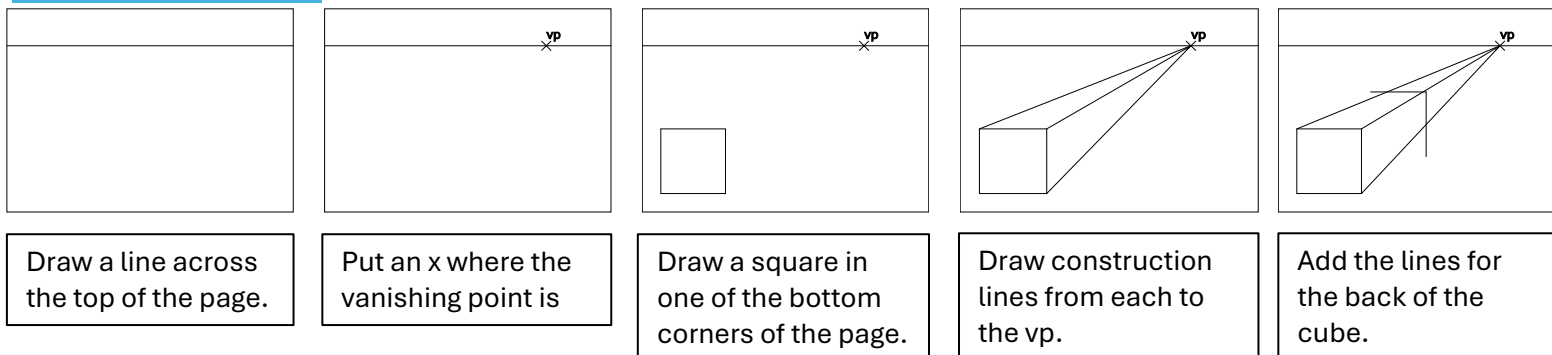


Draw a square 50 mm x 50mm.

Draw 3 lines that are 25mm long at an angle of 45°.

Draw the lines for the back of the cube.

One point perspective



Draw a line across the top of the page.

Put an x where the vanishing point is

Draw a square in one of the bottom corners of the page.

Draw construction lines from each to the vp.

Add the lines for the back of the cube.

Biomimicry

Biomimicry is when designers copy ideas from nature to solve problems. For example, **Velcro** was inspired by burrs sticking to animal fur, and **bullet trains** were shaped like a kingfisher's beak to reduce noise and drag. Nature's designs often lead to efficient, sustainable solutions.



Extra - Read/watch/do

Watch:

Biomimicry



<https://www.youtube.com/watch?v=V2GvQXvjhLA>



You will be assessed on

- Your ability to use a range of design/drawing techniques.
- Your ability to write a detailed specification.

Links to curriculum

Design
use a variety of approaches [for example, biomimicry and user-centred design], to generate creative ideas and avoid stereotypical responses

Design and Technology: polymers

Literacy / key words

Polymer

Polymer is another name for plastic.

Thermosetting polymers

Can only be formed once.

They are hard to recycle. They are good insulators and are resistant to heat and chemicals.

Thermoforming polymers

Can be heated and formed repeatedly. They are recyclable.

Crude oil

A primary source of plastics.

Bio degradable

able to decay naturally and in a way that is not harmful.

Micro plastics

small plastic pieces which can be harmful to our oceans

Vacuum forming

The simplest type of plastic forming, that uses a mold and vacuum pressure.

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 lights, visors and baths
High impact polystyrene (HIPS)	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 polythene (HDPE)	Stiff, strong, lightweight	Lightweight and flexible, can be recycled well, used for washing baskets, pipes and chairs
Thermosetting polymer	Physical properties	Working properties
Melamine formaldehyde	Hard, brittle	Food safe, printable surface, used for picnic wear
Polyester resin	A resin and a hardener, sets clear and smooth	Strong, heat resistant and good insulator, used as waterproofing and for encapsulating items
Urea formaldehyde	Smooth finish, limited colours	Heat resistant, hard, brittle and easily injection moulded, used for electrical fittings

ACCESSFM

- **Aesthetics** – How visually appealing is the design?
- **Cost** Is the product affordable to make or buy?
- **Customer** Who is the target audience for this?
- **Environment** How eco-friendly or sustainable is it?
- **Safety** Is it safe for users to operate?
- **Size** Are the dimensions suitable for its purpose?
- **Function** Does it perform its intended function effectively?
- **Materials** Are the materials appropriate?

CAD and CAM

Computer Aided Design (CAD) drawing allows products to be manufactured using Computer Aided Manufacture (CAM) Computer aided manufacture is very fast and accurate and requires less human intervention.

CAD

Techsoft 2d design



CAM

Laser cutter

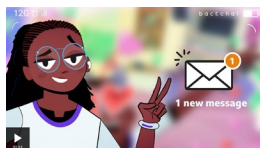


Extra - Read/watch/do

Watch:

the problems with plastics video

<https://www.bbc.co.uk/bitesize/articles/z4d62v4>



You will be assessed on

- Your knowledge of polymers
- Your ability to analyse existing products
- Your completed product (ball bearing maze)

Links to curriculum

Make

select from and use a wide and complex range of materials and components, taking into account their properties

Design and Technology: timbers

Literacy / key words

Coniferous

Soft woods come from coniferous trees. They keep their leaves all year and are quick growing.

Deciduous

Hardwoods come from deciduous trees. These are slow growing and lose their leaves in the winter.

Manufactured board

Manufactured board is a natural timber that is combined with adhesive to make a composite material. Examples include MDF, chipboard and hardboard

Life cycle assessment

(LCA) can be used to analyse all the stages in a product's life and highlight the impact it will have on the environment..

Softwood	Physical s and Working properties
Larch	Pale coloured with a contrasting darker grain, knotty. Durable, easy to machine, high sap content gives it good water resistance, used for exterior building and flooring
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

Hardwood	Physical properties and Working properties
Ash	Pale coloured, narrow grain Flexible and good for steam bending, tough, used for sports equipment
Teak	Teak is a durable, oily wood with a tight grain. It is moisture resistant, making it a good choice for outdoor use, eg outdoor furniture. It is also used in boat decks, chopping boards and flooring.
Oak	Moderate-brown colour with unique and attractive grain markings Tough and durable, polishes well, used for quality furniture

Manufactur ed board	Physical and Working properties
Medium-density fibreboard (MDF)	Smooth, light brown, can be veneere. Smooth and easy to finish, absorbs moisture so not suitable for outdoor use, used for kitchens and flat pack furniture
Plywood	Odd number of layers of veneer glued at 90 degree angles for strength, aesthetically pleasing outer layer Easy to cut and finish, can be stained or painted, used for shelving, construction and toys
Chipboard	Compacted wood chips, laminated with a variety of coverings, end cuts are difficult to finish Strong but absorbent to water, used for veneered worktops and flooring



Extra - Read/watch/do

Watch:

FSC



<https://www.youtube.com/watch?v=HBScUXDIF908>

You will be assessed on

- Your knowledge of timbers.
- Your ability to evaluate a final product
- Your completed product (desk tidy)

Links to curriculum

Make

Select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture.

Physical Skills and Techniques

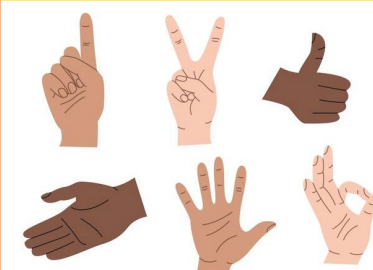


Body Language

Body language is communication by movement or position, particularly facial expressions and gestures.

Facial Expressions

A facial expression conveys an emotion that tells us about the character and the way they react to the situation



Gesture

A movement of part of a hand or the arm, to express an idea or meaning.

Tableau

In a tableau, participants make still images with their bodies to represent a scene



Levels

The use of different heights e.g. stood up or sat down to show how powerful a character is.

Proxemics

The distance between character/actors and what that means about their relationship/feelings/situation.



THE THREE C's OF DRAMA

Concentration
Cooperation
Communication

AUDIENCE

The people who watch a performance.



PERFORMANCE

A piece that is presented to an audience.



YEAR 7

INTRODUCTION TO DRAMA SKILLS

KNOWLEDGE ORGANISER



Mime

Success criteria for using this technique:

Exaggerated movement

Remember to show the weight and size of the object

Vocal Skills

Pitch

High or low

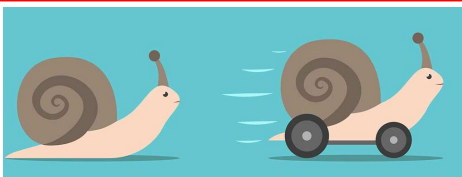


 **Volume**

Loud or quiet

Pace

Slow or fast



 **Tone**

The emotion in the voice

3 EXAMPLES OF VOCAL TONE:

Angry, happy, shocked

STAGE POSITIONING

Upstage right	Upstage Centre	Upstage left
Stage right	Centre stage	Stage left
Downstage right	Downstage centre	Downstage left

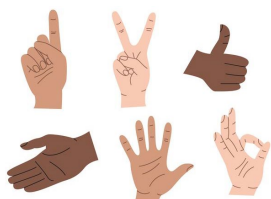
Audience

DRAMA



Body Language - Body language is communication by movement or position, particularly facial expressions and gestures.

Facial Expressions - A facial expression conveys an emotion that tells us about the character and the way they react to the situation



Gesture - A movement of part of a hand or the arm, to express an idea or meaning.

Tableau - In a tableau, participants make still images with their bodies to represent a scene



Levels - The use of different heights e.g. stood up or sat down to show how powerful a character is.

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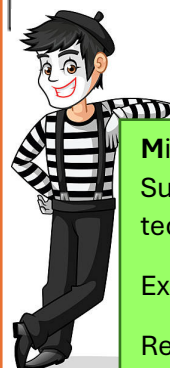
AUDIENCE

The people who watch a performance.



PERFORMANCE

A piece that is presented to an audience.



Mime

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High or low



Volume

Loud or quiet

Pace

Slow or fast



Tone

The emotion in the voice



3 EXAMPLES OF VOCAL TONE:

Angry, happy, shocked

THE THREE C's OF DRAMA

Concentration
Cooperation
Communication

Upstage right	Upstage Centre	Upstage left
Stage right	Centre stage	Stage left
Downstage right	Downstage centre	Downstage left

Audience

Treasure Island

Autumn 1:

Key Terminology

1	explicit characterisation	Something the author tells us directly about a character e.g. their age, appearance, job, address, likes, dislikes.
2	implicit characterisation	Something we have to infer about a character through their actions, their dialogue, what others say about them.
3	exposition	Refers to part of the story used to introduce background information about events, settings, characters etc. to the reader.
4	hero	A main character in a literary work who, in the face of danger, combats adversity through feats of resourcefulness, bravery or strength.
5	protagonist	The central character or leading figure in a poem, narrative, novel or any other story.
6	antagonist	The character who opposes the protagonist.
7	exposition	Refers to part of the story used to introduce background information about events, settings, characters etc. to the reader.
8	quest narrative	The main character, goes on a journey in search of something. The quest usually involves several hurdles and challenges, which the character must overcome
9	Bildungsroman	A novel that concerns itself primarily with the educational, emotional and moral development of the main character, usually from youth into adulthood.

10	verb	Usually has a tense. It can be an action but can also name states or feelings.
11	adjective	Used to modify a noun
12	expanded noun phrase	A group of words made up of a noun and words to describe that noun (such as adjectives and prepositional phrases).
13	first person narrative	A narrative or mode of storytelling in which the narrator appears as the 'I', recollecting his or her own part in the events which occur, either as a witness to the action or as an important participant in it.
14	setting	The time and place of the story, including the physical location, weather and cultural surroundings.

Vocabulary

A	pirate	A person who robs or commits illegal violence at sea or on the shores of the sea.
B	colonialism	A practice by which one country controls people or areas in another country, often by establishing colonies.
C	archetype	Something that a perfect or typical example of a particular kind of person or thing, because it has all their most important characteristics.
D	trait	A trait is a particular characteristic, quality, or tendency that someone or something has.

Literacy (spellings)

1. **Rebellion** – going against established order
2. **Resistance** – fighting against something/ someone
3. **Oppression** – being treated as lesser/ having rights taken away
4. **Illiterate** – being unable to read/write
5. **Systemic** – an idea or problem built into an organisation or society that is greater than individuals
6. **Verse** – story told in poetry
7. **Exploit** – take advantage of
8. **Coercion** – manipulate or control
9. **Aspiration** – having dreams/ ambitions
10. **Methods** – in English language

Adjectives - character

- Rebellious
- Cruel/ callous
- Loving/ kind
- Bitter/ disappointed
- Abusive/ controlling
- Traumatized
- Paranoid
- Ambitious/Determined
- Stubborn/ defiant
- Naïve/ ignorant
- Brave
- Obedient/ disobedient

Autumn 2: Run Rebel

Purpose of Non-



Language Methods

- **Direct address** (using 'I' to speak directly to the audience)
- **Alliteration** (repeating same sound e.g. 'Amazing Amber')
- **Rhetorical question**
- **Repetition**
- **Emotive language** (language with strong emotion e.g. 'scream/shout' rather than 'say')
- **Superlative** (showing highest degree e.g. 'most/ fastest')
- **Triplet** (list of 3)
- **Simile** (compare with link/as)
- **Hyperbole** (exaggeration for effect)
- **Metaphor** (comparing directly, without like or as)
- **Personification** (describing the non-human as human)
- **Modal verb** (shows possibility or obligation e.g. may, must, should, have to)

Key characters:

Amber Rai – British-Punjabi teenager protagonist (main character). Wants to be a runner, but faces resistance from her family

Tara – one of Amber's best friends.

David – one of her best friends

Mum – Amber's mum. She is illiterate and works in a sweatshop

Dad – An abusive alcoholic who is also illiterate

Ruby – Amber's older sister who was forced into an arranged marriage

Tiya – Ruby's young daughter (Amber's niece)

Jas – Ruby's husband

Miss Sutton – Amber's running coach and PE teacher

Gemma Griffin – a classmate Amber often bullies; were once friends

Mr Jones – Amber's history teacher

Harpreet – an older girl in Amber's community who ran away for a 'love' marriage

Beena – David's mum who runs a domestic violence refuge

WHW Analytical paragraphs:

(WHAT) – What is the author trying to say? Answer the question.

(HOW) – How does the author prove their point? Include the evidence of this from the text and name of the method or word type. How does this impact the reader?

(WHY) – Explain why the writer chose to write in that way, linking to their message and/or context

WHW Sentence Starters: Try to include at least one sentence of each colour!

- **(Writer's name)** presents **(topic)** as... because... This is shown in the quotation "...".
- The **(word/technique)** suggests... because...
- Also, the **(word/technique)** emphasises... because...
- The reader will **think/feel**... because...
- The writer intended to... because.../ The writer's message to the reader is... because...

Paragraph rules



Text



Knowledge



Inference

TIF: Poetic structure methods

- **Rhyme scheme** – a pattern of rhyme in a text e.g. A/B/A/B means lines A rhyme and lines B rhyme
- **Free verse** – poem that doesn't follow a consistent rhyme/ rhythm pattern
- **Stanza** – verse or section of poem, like a paragraph in writing
- **Enjambment** – sentence that continues over the end of a line without punctuation; usually feels 'flowing' and increases pace
- **End stopped line** – sentence in poem that ends with a full stop as in prose writing (non-poetry)
- **Caesura** – pause with punctuation in the middle of a line; usually feels abrupt and shocking
- **Mis-en-page** – how a text looks on the page
- **Acrostic poem** – poem where specific letters, usually the first letter of each line, spell out a word or phrase when read vertically
- **Shape poem** – poem that looks like a specific object

High tier punctuation:

! = shows strong emotion

? shows a question

; (connects two main clauses/ 'replaces and/but' or full stop)

: (introduces list, separate subordinate clause, 'replaces because')

() (introduces extra information, subordinate clause)

- ... - (introduces extra information, subordinate clause)

- (one dash shows a pause)

... ellipsis, showing an idea trailing off, building suspense

Tenses

Je suis	I am
tu es	You are
Il/elle/on est	He/she/it is
Je m'appelle	I call myself
tu t'appelles	You call yourself
il/elle s'appelle	He/she calls themselves
J'ai	I have
tu as	You have
il/elle/on a	He/she/it has

REGULAR PRESENT TENSE

	-ER	-IR	-RE
Je	e	is	s
Tu	es	is	s
Il/Elle/On	e	it	
Nous	ons	issons	ons
Vous	ez	issez	ez
Ils/Elles	ent	issent	ent

Opinions & Pronouns

☺ J'adore	☺ Ça m'intéresse (it interests me)
☺ J'aime	☺ Ça m'amuse (it amuses me)
☹ Je n'aime pas	☹ Ça m'énervé (it annoys me)
☹ Je déteste	☹ Ça m'ennuie (it bores me)

Connectives

aussi	also
mais	but
Cependant	however
que / qui	which
où	where
Parce que / car	because

Complexity

...Le plus – the most
 Très / vraiment – very / really
 Assez / un peu – quite / a little
 J'aimerais – I would like
 J'ai tendance à – I tend to..

Adjectives

Bien	Good
Bof,	Meh,
Mauvais	Bad
Comme ci comme ça	So so
Vraiment mauvais	Really bad
Fatigue (e)	tired
en colère	angry
Stressé (e)	stressed
Heureux/se	happy
Anglais (e)	English
Gallois (e)	Welsh
Irlandais (e)	Irish
Écossais (e)	Scottish
Espagnol	Spanish
Allemand (e)	German
Français (e)	French
Arabe	Arabic
Chinois (e)	Chinese
génial	great
Chouette	Ace
Fabuleux	Fabulous
Amusant	Fun
Excitant	Exciting
Ennuyeux	Boring
Irritant	irritating
penible	Annoying



1. Bonjour! – hello
2. Au revoir! – goodbye
3. Salut! - Hi
4. Bonsoir! – good evening
5. Ça va? – How are you?
6. (très) bien – (very) good
7. Comme ci comme ça – so, so
8. Ça va mal – I'm bad
9. Terrible – awful
10. Je vais – I am going..



LES NOMBRES 0-31 EN FRANÇAIS



0	zéro	16	seize
1	un	17	dix-sept
2	deux	18	dix-huit
3	trois	19	dix-neuf
4	quatre	20	vingt
5	cinq	21	vingt et un
6	six	22	vingt-deux
7	sept	23	vingt-trois
8	huit	24	vingt-quatre
9	neuf	25	vingt-cinq
10	dix	26	vingt-six
11	onze	27	vingt-sept
12	douze	28	vingt-huit
13	treize	29	vingt-neuf
14	quatorze	30	trente
15	quinze	31	trente et un

School Supplies in French



LES JOURS DE LA SEMAINE

Days of the Week

LUNDI	Monday
MARDI	Tuesday
MERCREDI	Wednesday
JEUDI	Thursday
 VENDREDI	Friday
SAMEDI	Saturday
DIMANCHE	Sunday

Mois de l'année



6

El tiempo libre	Free time
Jouer	To play
Chanter	To sing
Pratiquer	To practice
Acheter	To buy
Parler	To talk
Faire du vélo	To ride a bike
Danser	To dance
Cuisiner	To cook
Chercher	To search
Manger	To eat
Lire	To read
Regarder la télévision	To watch TV
Faire **	To do
Dormir	To sleep
Sortir	To go out
Aller	To go



7

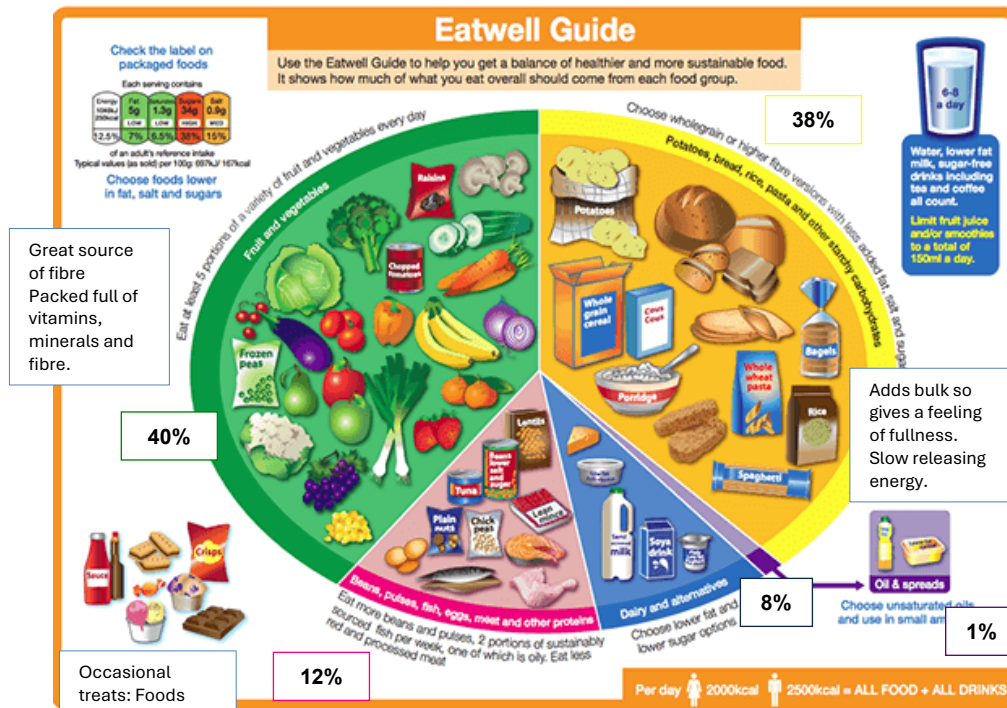
El tiempo	The weather
Il fait du soleil	It is sunny (<i>it makes sun</i>)
Il fait chaud	It is hot (<i>it makes heat</i>)
Il fait froid	It is cold (<i>it makes cold</i>)
Il fait du vent	It is windy (<i>it makes wind</i>)
Il fait beau	It is good weather
Il fait mauvais	It is bad weather
Il pleut	It rains
Il neige	It snows



8

	when
Le matin	In the morning
L'après-midi / Le soir	In the afternoon/evening
La nuit	At night
Le samedi	On Saturdays
Le week-end	On the weekends
Parfois / quelquefois	Sometimes
Toujours	Always
Jamais	never





8 tips for eating well

1. Base your meals on starchy foods.
2. Eat lots of fruit and vegetables.
3. Eat more fish – including a portion of oily fish each week.
4. Cut down on saturated fat and sugar.
5. Eat less salt – no more than 6g a day for adults..
6. Get active and be a healthy weight.
7. Don't get thirsty.
8. Don't skip breakfast.

Extra - Read/watch/do

<https://www.youtube.com/watch?v=7MIE4G8ntss>



Nutrient	How	Why
Cutting Fat	Eat more chicken and fish and less red meat Use skimmed or semi-skimmed milk instead of full fat milk Grill food instead of frying Cut fat off meat before cooking	Overweight Obesity Increase in Cholesterol in the blood Heart attack. Type 2 diabetes
Cutting down on Sugar	Avoid fizzy drinks and high calorie drinks. Have fruit juice or water instead. Eat fewer cakes, biscuits and sweets Eat more fruit as an alternative Try the natural sweetness of fresh fruit in puddings instead of sugar	Overweight Obesity Heart attack. Type 2 diabetes
Have more Fibre	Eat lots of fresh fruit and vegetables Eat more wholemeal flour, bread, pasta, rice Use more canned beans, peas and lentils eat more Try jacket potatoes with a variety of fillings	Helps to protect against diseases of the bowel. Gives you a feeling of fullness and so can help in diets.
Eat less salt	Use herbs and spices as an alternative to salt	Too much salt can lead to high blood pressure. This will increase the risk of suffering heart problems and strokes.

You will be assessed on:

- Food Hygiene and Food Spoilage
- Fruit/Sensory evaluation
- Healthy eating tasks and the 8 tips for eating well.
- Vitamins

Links to curriculum: Apply current healthy eating advice, and understanding of people's needs, to develop diets for different individuals.

Literacy / keywords

Personal Hygiene: people are sources of contamination. Personal hygiene must be followed to prevent food poisoning such as: -Wash hands before and after handling foods; tie or cover hair; remove jewellery;

Cross Contamination: The transfer of bacteria into food: Food to food, Food handler to food, Equipment to food

High Risk foods: are foods high in protein and moisture e.g. meat, dairy, cooked rice, gravy. Must be stored at a temperature below 5°C to prevent bacteria growth.

Types of Hygiene Hazards

Physical: fly, hair, broken glass, fingernails, plaster.

Biological: bacteria such as E. coli, Salmonella, Staphylococcus aureus. Bacillus cereus, Campylobacter.

Chemical: pesticides, herbicides, cleaning



Preventing cross contamination



Preparing food safely using the 4

Cleaning

- Keep yourself and hands clean
- Use clean equipment
- Use clean dish clothes and tea towels

Cooking

- Cook raw foods until the core is 75°C, check with a temperature probe.
- Reheat foods to 75°C
- Never reheat food more than once

Chilling

- Cool cooked foods for no longer than 90mins before refrigerating .
- High risk foods must be stored below 5°C

Cross Contamination

- Store raw foods away from cooked foods
- Use separate equipment (chopping boards and utensils)
- Wash hands after handling raw meat and before preparing food



Links to curriculum:

Demonstrate and apply the principles of cleaning, preventing cross contamination, safe storage of food including chilling, cooking food thoroughly; reheating food until it is steaming hot.



Enzymic Browning:
The process where fruit and vegetable turn brown due to them being

Knife Skills



Claw grip



Bridge hold



Rondelle



Julienne

3mm*3mm*3~5cm



Medium Dice

1.25*1.25*1.25cm



Small Dice

6*6*6mm

Food Spoilage

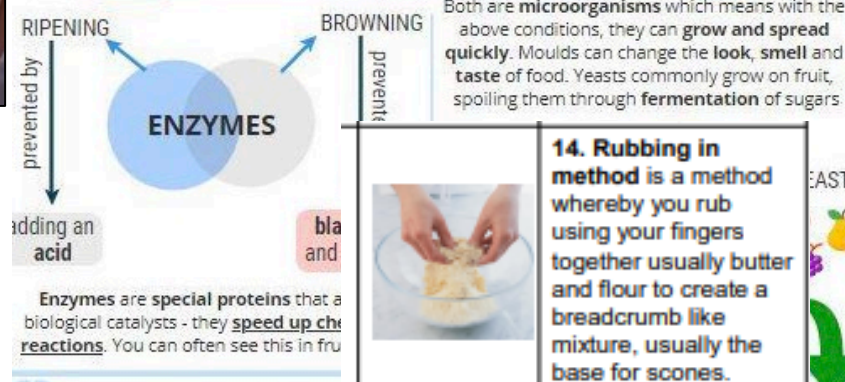
OVERVIEW

Five conditions needed for microorganisms to multiply:

1. Warmth
2. Moisture
3. Food
4. pH (not too acidic or alkaline)
5. Time



CAN CAUSE FOOD SPOILAGE:



Storing and Preparing Food Safely



Key abbreviations: Weights and Measurements

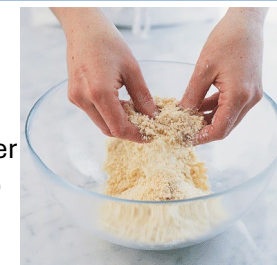
L	Litres	
g	Grams	
ml	millilitres	1000ml = 1 litre
Kg	kilograms	1000g
Tbsp	tablespoons	15ml
Tsp	teaspoon	5ml
1pt	1 pint	568ml



Chemical raising agents produce CO₂.
Alkali+ Acid+ liquid+ CO₂
Makes baked products like scone rise, light and soft.

Rubbing in method:

Is a method of rubbing your fingers together usually butter and flour to create a breadcrumb like mixture, used to make scones.



Food Technology

Literacy / Key terms

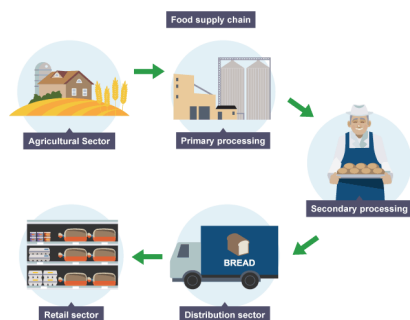
Food Miles:

The distance food has travelled to get to your plate. Food must travel from the farm it is grown on or the factory it is made in to a supermarket or shop to be sold.

Carbon Emission:

Harmful gases such as carbon dioxide are released into the earth's atmosphere when we use fossil fuels (coal and oil) to provide energy. We need energy to grow, produce and transport food. Some food uses more energy than others.

Local: a place close to where you live. Fruit and vegetables that were grown near you would be considered local.



Chocolate –ingredients coming from all over the world has a lot of food miles.



Vitamin	Foods	Functions	Deficiency
A	Cheese, milk, yoghurt eggs, oily fish, yellow, red and green (leafy) vegetables, such as spinach, carrots, sweet potatoes and red peppers, yellow fruit, such as mango, papaya and apricots	Fighting infection, better vision, keeping skin healthy	Night blindness
D	Our body creates this from direct sunlight but it is in: oily fish, red meat and egg yolks, liver	Helps keep bones, teeth and muscles healthy	Bone deformities such as <u>Rickets</u> in children, and Osteomalacia in adults.
E	Vegetable oil, olive oil, nuts, seeds, cereals	Healthy skin, eyes and immune system	Rare
K	Green vegetables, vegetable oil, cereals	Healing wounds	Rare. Problems with blood clotting

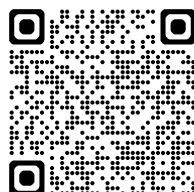
Task: When you next visit your supermarket check the food labels to see where the fruits and vegetables in your basket comes from

Strawberries grown in Manchester



Extra - Read/watch/do

<https://www.bbc.co.uk/bitesize/articles/zjnxwnb#zktxywx>



Links to curriculum: Examine where and how a variety of ingredients are grown, reared, caught, and processed, and consider sustainability and the impact of different choices on the environment. Define and demonstrate how to apply the principles of nutrition; that food and drinks provide energy and nutrients in different amounts; that they have important functions in the body; and that people require different amounts during their life and the implications of dietary excess or deficiency.

GEOGRAPHY: Year 7 - Skills and Climate

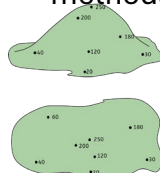
Literacy / key words

- **Continent** – One of the seven large land masses on Earth
- **Longitude** – The lines down the earth showing east or west
- **Latitude** – The lines across the earth showing north and south
- **Eastings** – The grid reference along the bottom
- **Northings** – The grid reference up the side
- **Contour lines** – Brown lines on a map that show height
- **Relief** – The height of the land
- **Topography** - The shape and physical features of an area
- **Altitude** - Height above sea level (measured in metres).
- **OS map** – Ordnance Survey is a map of areas of the UK

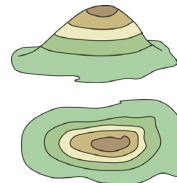
Maps and Symbols: OS maps use symbols to show human and physical features. Maps have a **title**, **labels**, a **compass rose**, a **scale** and a **key**.



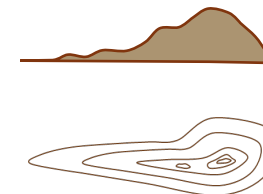
Relief: Height and slope on a 2D map can be shown using three methods:



Spot heights – a dot giving the exact height of a specific point.



Colour layering - different heights are shown by bands of different colours.



Contour lines – brown lines connecting areas of the same height.

Extra - Read/watch/do

- Investigate maps by going into online maps, getting an atlas from the library to buying your own. Use them to find out more about the human and physical features of different parts of the world.
- Watch documentaries about other parts of the world. Recommended ones include Planet Earth and Human Planet.

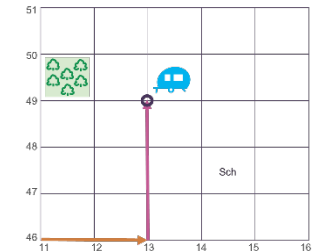
You will be assessed on

The key assessment skill in Year 7 is to describe. You should show an ability to:

- Say what the place is like – physical and/or human features
- Use key terms
- Give specific facts
- TIF: Explain why these features exist in that place

Four-figure grid references: These are used to describe locations on an OS map.

1. Look at the bottom-left corner of the square.
2. Find the **easting**.
3. Find the **northing**.
4. Write down the four-figure grid reference.



Links to curriculum

We will continue to use maps skills throughout every unit in KS3 and KS4. The characteristics of climate affect many different aspects of Geography, from ecosystems to development, so we will draw on our knowledge from this unit throughout KS3 and KS4.

GEOGRAPHY: Year 7 - Skills and Climate

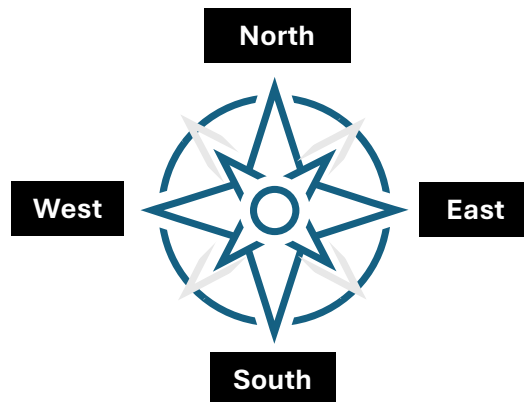
Continents and Oceans:



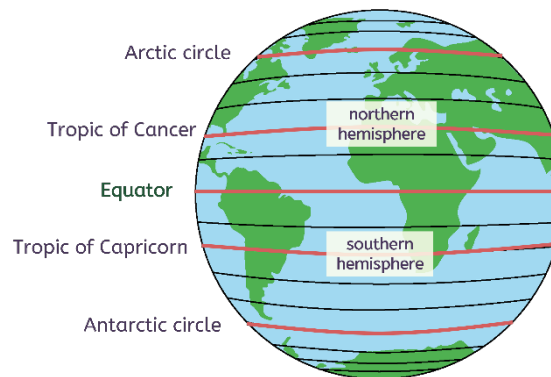
Countries in the UK:



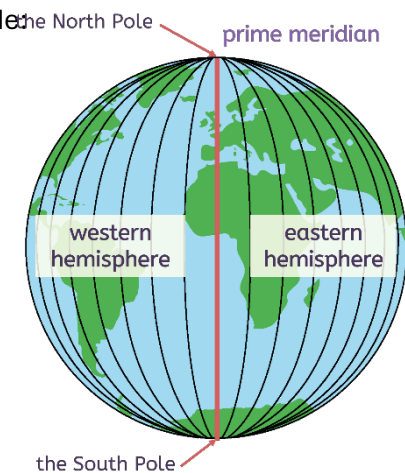
Compass rose:



Latitude:

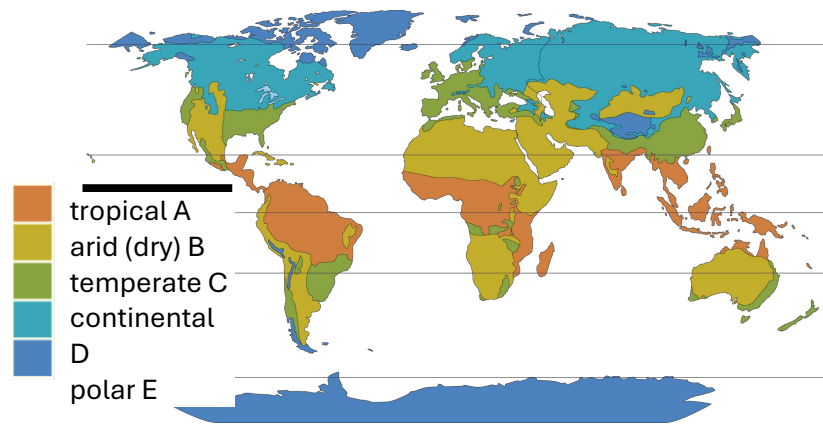


Longitude:

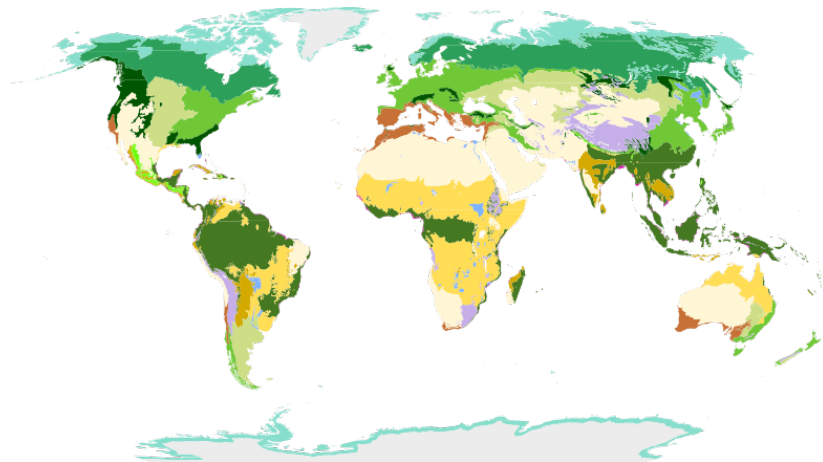


Literacy / Key Terms:

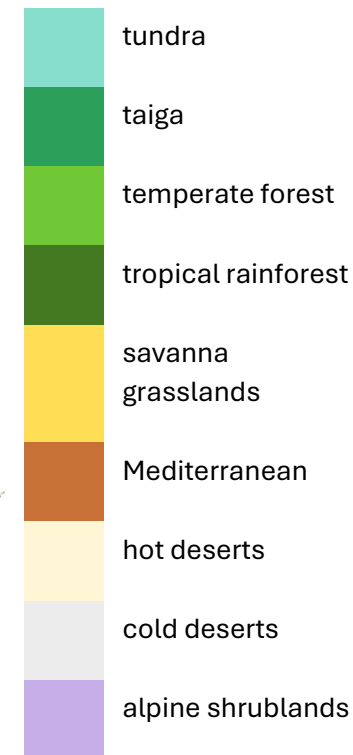
- **greenhouse gases** – gases such as carbon dioxide that trap heat within the atmosphere
- **the greenhouse effect** – the natural warming of the planet to its habitable temperature, caused by trapping heat in the Earth's atmosphere
- **the enhanced greenhouse effect** – the unnatural warming of the Earth due to increased greenhouse gases in the atmosphere
- **global warming** – the increase of average temperatures on Earth; this happens naturally but happens faster due to the enhanced greenhouse effect
- **climate change** – the change in the Earth's long-term weather patterns, including precipitation, wind and temperature
- **fossil fuel** – a (chemical) store of energy formed over millions of years from dead plants and animals.



Biomes: Biomes are areas of the world that, because of similar climates, have similar landscapes and wildlife. Biomes are shown on the map.

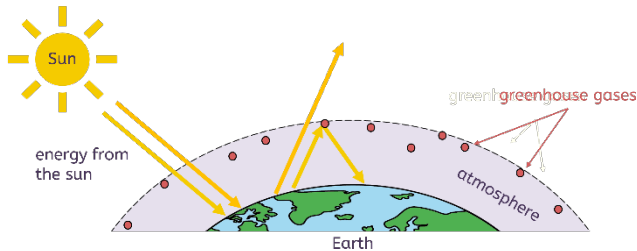


Climate Zones: Climate zones are areas in the world that have a similar climate. There are several major climate zones in the world, and the main six are shown on this map. The climate zones generally group together horizontally, following lines of latitude.



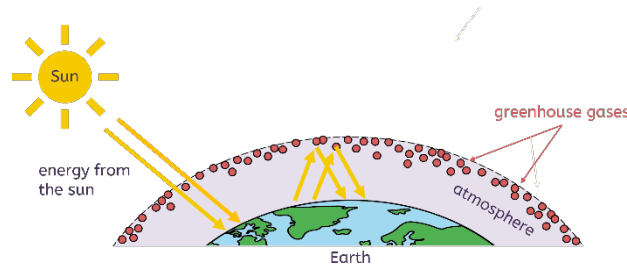
GEOGRAPHY: Year 7 - Skills and Climate

Greenhouse Effect:

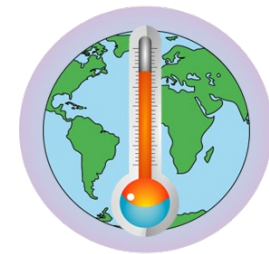


The **greenhouse effect** is the **natural process**, **which** has always taken place, that keeps the Earth warm. Without it, the Earth would be too cold to live on.

The light and heat energy are trapped in the atmosphere by greenhouse gases, such as carbon dioxide. This warms the Earth.



The **enhanced greenhouse effect** causes an **unnatural increase in temperature**. Human activities (such as burning fossil fuels, transport, waste, agriculture, deforestation) increase the amount of greenhouse gases in the atmosphere. The Earth warms more quickly, and global warming increases.



Accelerated global warming can also lead to other changes in the Earth's long-term weather patterns, such as precipitation, wind and storms. The changes to the Earth's wider climate – not just temperature – are called **climate change**.

Human causes of climate change:

Climate change is caused by:

- burning fossil fuels for transport and electricity generation, which releases greenhouse gases
- deforestation, which reduces the absorption of greenhouse gases
- agriculture and waste disposal, which release greenhouse gases

The effects of climate change:

Climate change can cause:

1. more extreme weather events, such as heatwaves
2. melting sea ice and ice caps
3. rising sea levels and flooding of coastal

GEOGRAPHY: Year 7 - Development

Background

Across the world, the standard of living and quality of life can be very different.

A Countries therefore have different classifications based on the quality of life within them.

B How developed a country is can be measured in different ways.

C Development levels can vary within and between countries. There are many reasons why some countries are more developed than others.

D,E Countries can become more developed in many ways, including through economic growth from tourism, top-down development projects and bottom-up development projects.

A) Country Classification

1 developed	(n) countries with high standards of living, advanced infrastructure and strong economies.
2 emerging	(n) countries transitioning between developing and developed, showing rapid improvements in infrastructure.
3 developing	(n) countries with lower standards of living, less advanced infrastructure and economies that are growing but not yet strong.

B) Measuring Development

1 GNI per capita	(n) the average income of a country's citizens.
2 infant mortality rate	(n) the number of babies that do not survive to one year old per 1,000 births.
3 life expectancy	(n) the average number of years a person is expected to live.
4 literacy rate	(n) the percentage of people in a specific age group, typically aged 15 and above, who can read and write.
5 average years of schooling	(n) the average number of years of education that individuals aged 25 and older have completed.
6 Human Development Index (HDI)	(n) a composite measure of development that is used to categorise the development of countries using GNI per capita, life expectancy and average years of schooling.

C) Factors that hinder development

Human	Physical
uneven distribution of income	challenging relief
corruption	extreme climate
conflict	lack of natural resources
low-value goods and services for trade	landlocked
high levels of debt	tectonic hazards
poor education systems	extreme weather
poor healthcare systems	lack of water resources

D and E) Examples of Development

D) Top-down project: The Grand Inga Dam DRC

Advantages	Disadvantages
It provides a reliable source of renewable energy for the DRC.	It would flood 22,000 hectares of land in the Bundi Valley.
It provides electricity for Kinshasa at a lost cost.	Natural habitats will be destroyed by the reservoir.
It produces electricity that the DRC can sell the other countries.	35,000 people would be displaced from their homes by the dam reservoir.
It produces electricity to power more coltan and copper mines.	Electricity will be sold to other countries, and many people in rural DRC will still be without electricity.

E) Bottom-up project: WECAN DRC

Advantages	Disadvantages
It protects the habitats of 100,000 species of animals and plants.	It is small scale, so it has limited reach.
It empowers indigenous women.	It does not stop illegal logging.
Women earn money from selling fruit and herbs from the trees planted.	The project currently supports only 700 women.
It reduces the impact of climate change through reforestation.	It takes a long time for the full benefits to be achieved.

History

Topic 1 – Empires East and West c.1000

1	dynasty	(n) a sequence of rulers from the same family.
2	innovation	(n) the process of improving something or creating something that is a new technology.
3	empire	(n) a group of countries ruled by a single ruler.
4	caliph	(n) the ruler of the Islamic Empire.
5	astronomy	(n) the study of space, including stars and planets.
6	madrassa	(n) Muslim school or college.
7	pilgrim	(n) a person who makes a journey, often a long and difficult one, to a special place for religious reasons.
8	apothecary	(n) a person who in the past made and sold medicines.
9	monarch	(n) king or queen.
10	inference	(n) a conclusion drawn from evidence based on what is seen and what is already known.

Topic 2 – Norman Conquest

1	migration	(n) the movement of people from one place to another.
2	invade	(v) to enter an area by force to take control.
3	succession	(n) the order of taking over an official title or position.
4	inherit	(n) to receive something from a person who has died.
5	claimant	(n) a person who believes they have a right to something.
6	oath	(n) a promise witnessed by God.
7	illegitimate	(n) a child born to parents who are not married.
8	conquer	(v) to take control of a place or people by force.
9	cavalry	(n) a group of soldiers who fight on horses.
10	archer	(n) a person who shoots with a bow and arrow
11	infantry	(n) Soldiers who fight on foot.
12	coronation	(n) a ceremony where the new monarch is crowned.
13	Motte and Bailey Castle	(n) a simple castle with a man-made hill surrounded by a clear defensive area.
14	Harrying	(v) to repeatedly attack somewhere or something.
15	feudal system	(n) system where someone who held land gave land to others on the condition that they serve them.
16	primogeniture	(n) being the first-born child.
17	source	(n) Things that people made or wrote during the time in history you are studying.
18	interpretation	(n) This is an opinion about what the past was like.

Place

The **Silk Road** was an important trading route for spices, silk and knowledge. The Silk Road connected China with European countries.



Holy Roman Empire:

Emerging in 800 AD with Charlemagne's coronation and lasted until 1806. A loose collection of Central European states ruled by an emperor, not a single unified nation. Religion and the Pope played a key role in its legitimacy and politics. Frequently involved in power struggles between emperors and local rulers (princes, bishops).

Byzantine Empire:

Eastern half of the Roman Empire that survived after the fall of Rome (476 AD). Capital: **Constantinople** – a major centre of trade, learning, and Christianity. Preserved Roman laws and culture through the **Justinian Code**. Famous for religious art and architecture (e.g. Hagia Sophia) and the continuation of Orthodox Christianity.

Chinese Dynasties (focus on Tang and Song):

Tang Dynasty (618–907): A golden age of Chinese art, literature, and expansion. **Song Dynasty (960–1279):** Known for innovation (printing, gunpowder, compass) and strong government structure. Civil service exams promoted merit-based leadership. Dynastic rule was shaped by the **Mandate of Heaven** – the belief that emperors ruled with divine approval.

Islamic Empire (Umayyad and Abbasid Caliphates):

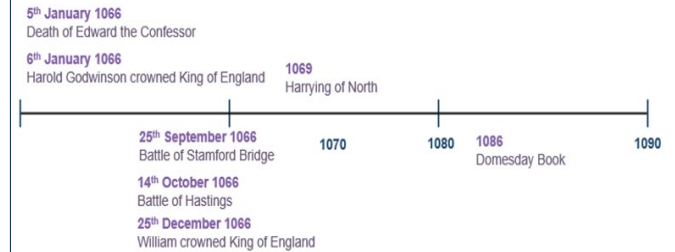
Spread rapidly after the death of Muhammad in 632 AD across the Middle East, North Africa, and Spain. **Umayyad Caliphate (661–750):** Expanded the empire and moved the capital to Damascus. **Abbasid Caliphate (750–1258):** Capital in **Baghdad**, which became a center of learning and culture. Major contributions in science, medicine, mathematics, architecture, and literature (e.g. House of Wisdom).

Chronology

A	chronology	(n) the arrangement of events, or dates, in the order of occurrence.
B	millennium	(n) a period of 1,000 years.
C	century	(n) a period of 100 years.
D	decade	(n) a period of 10 years.

Place

This unit will focus on **England**. The UK was formed in 1801 under the Act of Union



Succession Crisis (1066):

King Edward the Confessor died without a clear heir. Three main claimants: **Harold Godwinson**, **William of Normandy**, and **Harald Hardrada**. Harold crowned king, but William believed he had been promised the throne.

Norman Conquest:

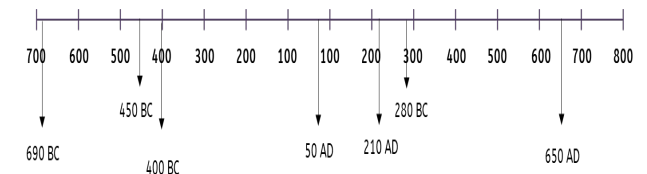
William invaded England and defeated Harold at the **Battle of Hastings (1066)**. William became **King of England** and began to establish Norman rule.

Controlling England:

Built **castles** (e.g. motte and bailey) across England to show power and suppress rebellion. Introduced the **feudal system**: land was granted to loyal nobles in exchange for military service. Used violence and fear to maintain control (e.g. **Harrying of the North**).

Changes to Society:

Castles: New stone castles dominated the landscape and acted as military strongholds. **Feudal System:** Society was organised by strict hierarchy – king, barons, knights, peasants. **Domesday Book (1086):** A detailed survey of land, people, and resources used to tax and control the population.



Topic 3 – Medieval Religion

1	chivalry	(n) the qualities expected of an ideal knight including courage, honour, and being prepared to help those in need.
2	Church	(n) the institution of the Christian Church, including all the people who ran it and all the individual churches.
3	church	(n) a Christian place of worship.
4	clergy	(n) officials of the Church led by the pope.
5	crusade	(n) wars between European Christians and Middle Eastern Muslims that occurred 1095-1291.
6	excommunication	(n) power of the pope to expel someone from the Church.
7	laity	(n) ordinary people who attend church but do not hold official religious positions.
8	martyr	(n) a person who suffers or is killed because of their religious or political beliefs.
9	mass	(n) religious service on a Sunday that worshippers were expected to attend.
10	monastery	(n) a building in which monks live and worship.
11	persecution	(n) unfair or cruel treatment over a long period of time because of race, religion or beliefs.
12	pilgrimage	(n) a journey typically taken to a site of religious importance.
13	purgatory	(n) a place where an individual's soul stayed until all their sins had been forgiven.
14	relic	(n) part of a saint's body or something they owned which was believed to have the power to perform miracles.

The Power of the Church

The Church owned large amounts of land and collected the **tithe** (10% tax on income).

Church leaders advised kings and had great political influence. The Church could **excommunicate** people (expel them from the Church), including kings.



Religious Beliefs and Practices

People attended **Mass** regularly, believed in **Heaven, Hell, and Purgatory**.

Seven Sacraments (especially baptism, confession, and communion) were essential to salvation.

Pilgrimage was a common religious duty (e.g. Canterbury, Rome, Santiago de Compostela). People believed in **miracles, saints, and relics**.



Monasteries and Monastic Life

Monasteries were places of prayer, learning, and care for the sick and poor. Monks and nuns followed strict rules (e.g. the **Rule of St Benedict**). They preserved knowledge by copying books and maintained education and charity.



The Importance of the Church

The Church was central to everyday life – almost everyone was Christian. People believed the Church held the key to **heaven and hell**. Churches were found in every village and town; cathedrals were large and impressive.

Extra - Read/watch/do

The Power of the Church:

<https://www.youtube.com/watch?v=IVsAykBb92U>

Medieval Civilisations:

<https://www.bbc.co.uk/bitesize/articles/zw8nhcw>

You will be assessed on

The Silk Road, Chinese Dynasties, the Byzantine and Holy Roman Empires

The succession crisis in 1066, William the Conqueror, the Battle of

Themes and Threads

Power



The control a person or group has in a country.

For example, the Church had their very own hierarchy comprised of the pope, archbishop, bishops, priests, monks and nuns.

This includes threads such as warfare and protest.

Identity



The qualities and characteristics that make a person who they are and what they value as important.

For example, while Christianity (Catholicism) was the most common religion in medieval England, people following other faiths lived in England at this time too.

This includes threads such as the role of women.

Connectivity

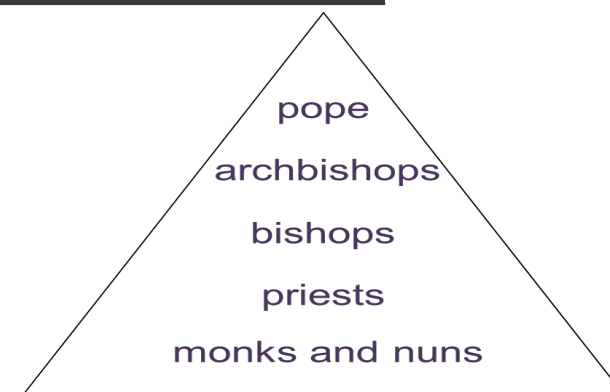


The act of joining or being linked to somewhere, someone or something else.

For example, Jews migrated to England in 1070, invited by William I.

This includes threads such as trade and medicine.

Church hierarchy



Links to curriculum

RE

English

Geography

French

KPI 7.01 Numerical Skills

1) Place Value	The value of a digit relating to its position in a number. In 1482 the digits represent 1 thousand, 4 hundreds, 8 tens and 2 ones.	2) Integer	Whole numbers including zero. -2, -1, 0, 1, 2, 3 ...																					
3) Decimal	A number with a decimal point in it. It can be positive or negative. 0.3, 1.26, -3.4 etc.	4) Positive Number	Any number above zero. 1, 2, 3, 4 ...																					
5) Negative Number	Any number below zero. Always written with a negative sign in front of it: -1, -2, -3 ...	6) Zero Place Holder	A zero that is used as a place holder to denote the absence of a power of 10 E.g. 506 has no tens so there is a 0 in the tens column.																					
7) Even Number	Any integer that can be divided by 2 without leaving a remainder. 2, 4, 6, 8, 10 ...	8) Odd Number	Any integer that cannot be divided by 2 without leaving a remainder. 1, 3, 5, 7, 9 ...																					
9) Square Number	The result of multiplying a number by itself. It will always be positive. 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144 ...	10) Square Root	The opposite of squaring a number to find the original factor. E.g. $\sqrt{9} = 3$ or -3																					
11) Inequality	When one number, or quantity, is not equal to another. a < b a is less than b a > b a is greater than b a = b a is equal to b a ≠ b a is not equal to b	12) Ascending	Smallest to largest.																					
		13) Descending	Largest to smallest.																					
14) Decimal Place Value	The value of each digit after the decimal point. Tenth, hundredth, thousandth etc.	17) Rounding	<table><tr><td>Round to</td><td>Circle, Underline, Decide</td><td>Answer</td></tr><tr><td>Nearest 1000</td><td>5<u>7</u> 8 3 . 1 9 9</td><td>≈ 6000</td></tr><tr><td>Nearest 100</td><td>5 7 <u>8</u> 3 . 1 9 9</td><td>≈ 5800</td></tr><tr><td>Nearest 10</td><td>5 7 8 <u>3</u> . 1 9 9</td><td>≈ 5780</td></tr><tr><td>Nearest integer</td><td>5 7 8 3 . <u>1</u> 9 9</td><td>≈ 5783</td></tr><tr><td>1 d.p.</td><td>5 7 8 3 . 1 <u>9</u> 9</td><td>≈ 5783.2</td></tr><tr><td>2 d.p.</td><td>5 7 8 3 . 1 9 <u>9</u></td><td>≈ 5783.20</td></tr></table>	Round to	Circle, Underline, Decide	Answer	Nearest 1000	5 <u>7</u> 8 3 . 1 9 9	≈ 6000	Nearest 100	5 7 <u>8</u> 3 . 1 9 9	≈ 5800	Nearest 10	5 7 8 <u>3</u> . 1 9 9	≈ 5780	Nearest integer	5 7 8 3 . <u>1</u> 9 9	≈ 5783	1 d.p.	5 7 8 3 . 1 <u>9</u> 9	≈ 5783.2	2 d.p.	5 7 8 3 . 1 9 <u>9</u>	≈ 5783.20
Round to	Circle, Underline, Decide		Answer																					
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2 d.p.	5 7 8 3 . 1 9 <u>9</u>	≈ 5783.20																						
15) Decimal Places	The number of digits after the decimal point. E.g.14.278 has 3 decimal places.																							
16) Estimate	Find a rough or approximate answer by rounding. e.g. 2.3 x 18.4 ≈ 2 x 20 = 40 ≈ ‘approximately equal to’																							

KPI 7.02 Order of Operations

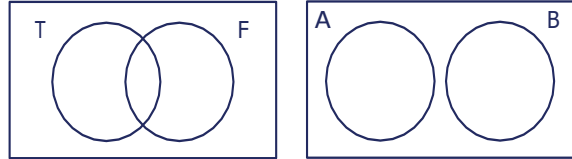
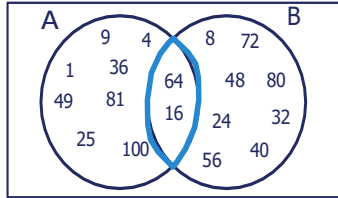
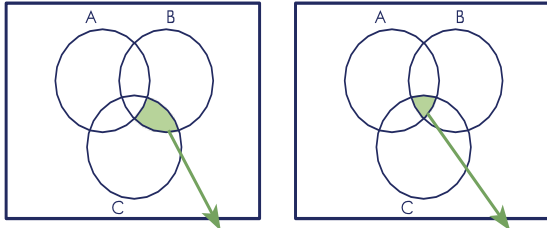
1) Operation	A rule for combining numbers + - × ÷	2) Evaluate	To work out the value of.
3) Index Notation	The index tells us how many times the base is being multiplied by itself. The plural of index is indices.	Power Index 23 Base	
4) Order of Operations	B = Brackets I = Indices and Roots DM = Division and Multiplication AS = Addition and Subtraction		
	If we have a calculation with addition or subtraction only then we calculate from left to right. 18 - 10 + 2 8 + 2 10	If we have a calculation with multiplication or division only then go from left to right. 8 × 5 ÷ 4 × 10 8 × 5 ÷ 4 × 10 40 ÷ 4 × 10 10 × 10 = 100	

KPI 7.03 Introduction to Algebra

1) 2a	$2 \times a$	2) ab	$a \times b$
3) a²	$a \times a$	4) 3a²	$3 \times a \times a$
5) a subtracted from b	$b - a$	6) a less than b	$b - a$
7) a subtract b	$a - b$	8) a reduced by b	$a - b$
9) a divided by b	$\frac{a}{b}$	10) b divided by a	$\frac{b}{a}$
11) 4 times smaller than a	$\frac{a}{4}$	12) 4 times larger than a	$4 \times a \rightarrow 4a$
13) 5th power of a	a^5	14) Variable	A letter used to represent any number.
15) Coefficient	The number to the left of the variable. This is the value that we multiply the variable by. $4x \rightarrow$ The coefficient of x is 4. $x \rightarrow$ The coefficient of x is 1.	16) Term	A single number, variable or numbers and variables multiplied together.
17) Expression	A mathematical statement which contains one or more terms combined with addition and/or subtraction signs. E.g. $4x + 3y$.	18) Collecting like terms	Combining the like terms in an expression. $7x + 3y - 2x$ is simplified to $5x + 3y$.
19) Substitute	Replace a variable with a given value. E.g. if $b = 10$, $2b = 2 \times 10 = 20$ $b - 2 = 10 - 2 = 8$	20) Rearrange	Alter the position of variables using the 4 operations. $5 = \frac{a}{t}$ $t = \frac{a}{5}$ $a = 5 \times t$

KPI 7.04 Primes, Factors and Multiples

1) Factor	Any whole number that divides exactly into another number leaving no remainder is a factor. Factors of 20 are: 1, 2, 4, 5, 10, 20	2) Multiple	The result of multiplying a number with a whole number (all times tables!). The multiples of 7: 7, 14, 21, 28, 35, 42, 49, 56, 63, 70 ...
3) Highest Common Factor (HCF)	The HCF of 2 or more numbers is the largest number that is a factor of each of those numbers. E.g. HCF of 18 and 45 = 9 18: 1, 2, 3, 6, 9 , 18 45: 1, 3, 5, 9 , 15, 45	4) Lowest Common Multiple (LCM)	The LCM of 2 or more numbers is the smallest number that is a multiple of each of those numbers. E.g. LCM of 6 and 8 = 24 6: 6, 12, 18, 24 , 30, 36, 42, 48, 54, 60 8: 8, 16, 24 , 32, 40, 48, 56, 64, 72, 80
5) Prime Numbers	A prime number only has two distinct factors: 1 and itself. 2 is the only even prime number. 1 is not a prime number. Prime numbers between 1 and 100 are: 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97		

6) Venn Diagrams	These were created by an English Mathematician, John Venn (1834 – 1923). They are used to sort groups of data and consist of two or more circles, often overlapping, contained inside a rectangle.	
7) One Intersection	In a Venn diagram with 2 circles, an overlap represents a section where elements (E.g. numbers) lie in both sets (E.g. A and B). The overlap between the sets, is called the intersection. E.g. A = First ten square numbers B = First ten multiples of 8	16 and 64 are in the intersection as they are in both sets. 
8) Multiple Intersections	If a Venn diagram is representing three sets, it will have three circles. Each circle will <u>often</u> overlap with another data set twice, with all three circles overlapping at the centre.	

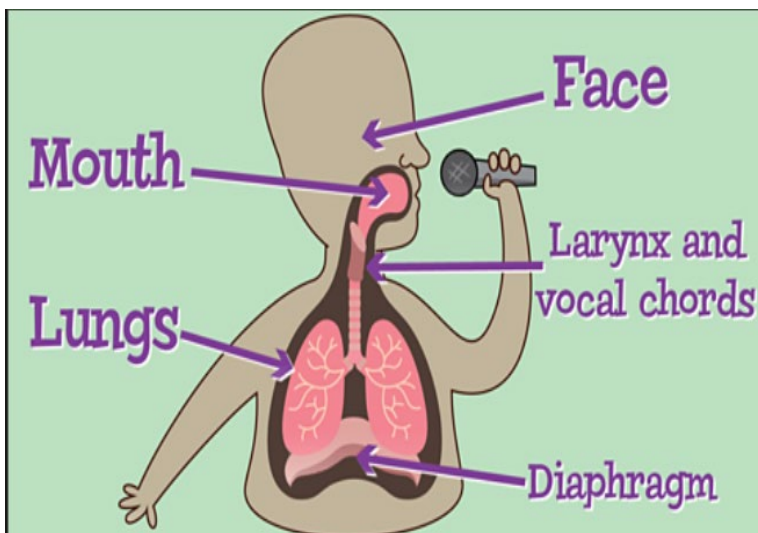
KPI 7.05 Expanding and Factorising 1

1) Expand	Multiply out the bracket(s) in the expression. E.g. $3(5x + 7) = 15x + 21$	2) Factorise	Identify the HCF and rewrite the expression with brackets. E.g. $6x^2 + 9x = 3x(2x + 3)$
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KPI 7.06 Addition and Subtraction

1) Addition Plus, add, sum, more than.	To find the total of two or more numbers. The inverse operation is subtraction.	$\begin{array}{r} 1.38 \\ 4.90 + \\ \hline 6.28 \\ \text{1} \end{array}$	2) Subtraction Subtract, minus, take away, less than.	To find the difference between two numbers. The inverse operation is addition.	$\begin{array}{r} 8.1 \\ 4.90 \\ 1.38 - \\ \hline 3.52 \end{array}$
3) Commutative	Addition is commutative – the order of addition does not change the result. Subtraction is not commutative.		4) Associative	When you add you can do so regardless of how the numbers are grouped. Subtraction is not associative.	
5) Two-way Table	A visual representation of the possible relationships between two sets of categorical data. You can add and subtract values horizontally and vertically to find totals or missing values.	{ The values in a column have a total at the bottom of the column. } The values in a row have a total at the right-hand side of the row.			

The Anatomy and Warming Up



How to warm up the three areas

Mouth:

- Tongue twister
- Chew the toffee
- 'My Mum'
- Mouth stretches 'A, E, I, O, U'

Vocal cords/ Larynx:

- Rollercoaster
- Humming/ Singing exercises

Diaphragm and Lungs:

- Controlled breathing exercises/ square breathing

KEY WORDS – test yourself! (definitions on the next page)

Larynx	Vocal chords	Enunciation	Vocal range	Pitch
Intonation	Major	Minor	Diaphragm	
Voice Projection	Dynamics	Crescendo	Diminuendo	



SINGING SKILLS

Year 7 Autumn Term

DYNAMIC MARKINGS

Term	Symbol:	Effect:
pianissimo	<i>pp</i>	very soft
piano	<i>p</i>	soft
mezzo piano	<i>mp</i>	moderately soft
mezzo forte	<i>mf</i>	slightly loud
forte	<i>f</i>	loud
fortissimo	<i>ff</i>	very loud
fortepiano	<i>fp</i>	loud then soft
sforzando	<i>sfz</i>	sudden accent
crescendo	<	gradually louder
diminuendo	>	gradually softer

Stage Presence:

When performing a piece of music to an audience it is very important you sound good and present yourself well. Besides knowing your words and singing in tune there are some basic elements you need to consider:

- ENUNCIATE your words clearly
- PROJECT your voice by engaging your diaphragm
- Face the AUDIENCE
- ENGAGE with the music – appropriate facial expressions
- WATCH the conductor/ group leader
- Don't fidget
- Stand up straight – GOOD POSTURE gives the impression of confidence
- Look smart
- Enter and leave the performance area in a

KEY WORDS AND MEANINGS:

Vocal Range	The range of pitches that an individual human voice can reach.
Intonation	The variation in the pitch level of the voice (the ups and downs). Intonation can be very expressive and demonstrate surprise, anger, wariness etc.
Diaphragm	A thin muscle that sits at the base of the chest and separates the abdomen from the chest. It contracts when you inhale - which pulls air into the lungs. When you exhale, the diaphragm relaxes and the air is pushed out of lungs.
Larynx	Otherwise known as the voice box, it is an organ in the top of the neck involved in breathing, producing sound and protecting the trachea against food aspiration.
Voice Projection	The strength of speaking or singing whereby the voice is used powerfully and clearly, even when singing quietly or whispering.
Enunciation	The act of pronouncing words clearly.
Pitch	How high/low a sound is
Major tonality	A 'happy' sounding collection of notes.
Minor tonality	An 'unhappy' sounding collection of notes.
Dynamics	Volume.
Crescendo	Gradually getting louder.
Diminuendo	Gradually getting quieter.

11 census

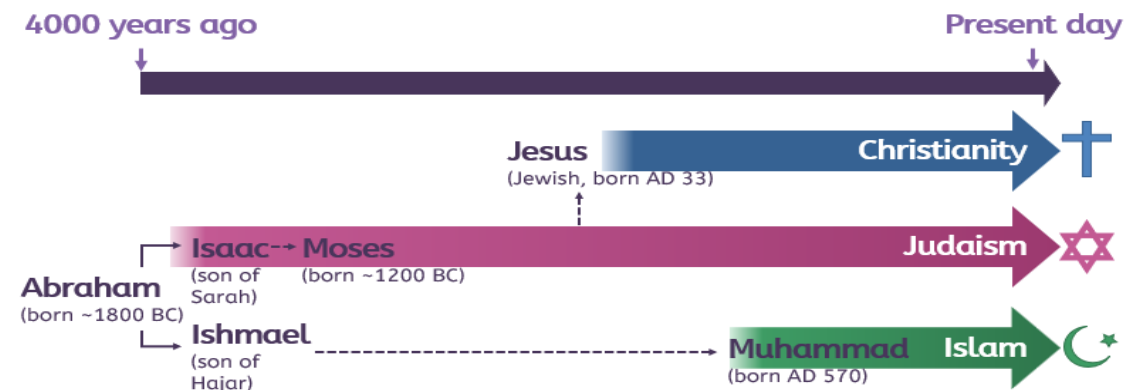
An official survey of the people who live in a country.

<https://youtu.be/VXnSE0uvwzM> - What are Worldviews?

<https://www.bbc.co.uk/bitesize/articles/zfs2kmn> - Facts about Religious and Non-religious beliefs

1	Abrahamic faith	one of three faiths that are all linked by Abraham: Judaism, Christianity and Islam.
2	monotheism	the belief that there is only one God
3	polytheism	the worship of or belief in more than one god
4	covenant	an agreement between two sides (between humans and God)
5	sin	an action that is believed to go against the laws of God
6	idol	objects or images that represent gods
7	atonement	making up for something that someone has done wrong
8	sacrifice	to give up something valuable in order to gain something else
9	sermon	a talk about a religious or moral subject given by a leader in the religion
10	prophet	someone chosen by God to say the things God wants them to tell people

YEAR 7 What are the Origins of the Abrahamic Faiths?



Introduction to Holy Books:

The Torah	Holiest scripture for Judaism. The word means “law” in Hebrew. It was written by Moses. It is also important in Christianity and Islam.
The Qur’an	Holiest scripture for Islam. The word means “recite” in Arabic. It was revealed to the Prophet Mohammed.

The Covenant and the Abrahamic Faiths:

Abraham is a monotheist and worships only one God. God promises to look after Abraham and his descendants because of this, and that his descendants will be a blessing to the world. Abraham has two sons, Isaac (who Moses and Jesus are descended from) and Ishmael (who Muhammad is descended from). Moses is given the Ten Commandments as part of the covenant. Christians believe Jesus is part of the covenant being fulfilled. Muslims believe prophecy is a part of the covenant.

1	diversity	Differences between a group or setting.
2	Christianity	The religion that Christians follow.
3	Islam	The religion that Muslims follow.
4	Judaism	The religion that Jewish people follow.
5	Hindu Dharma	The religion that Hindus follow.
6	Sikhi	The religion that Sikhs follow.
7	Buddhism	The religion that Buddhists follow.
8	Humanism	A non-religious tradition followed by Humanists .
9	migration	The movement of people from one place to another.
10	persecution	Unfair or cruel treatment over a long period of time because of race, religion or political beliefs.

11	resurrection	coming back to life after someone has died
12	theology	the study of God and ideas about God.
13	theologian	someone who studies theology, who might look at how holy texts and ideas about God influence people's beliefs and actions.

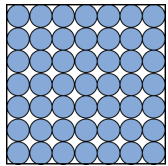
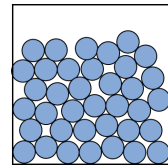
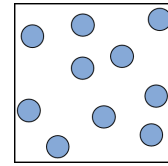
Extra - Read/watch/do

<https://www.bbc.co.uk/bitesize/articles/zw3vcxs#zpwd239> – Covenant with Abraham

<https://www.bbc.co.uk/teach/class-clips-video/articles/z6kcwty> - Holy Books

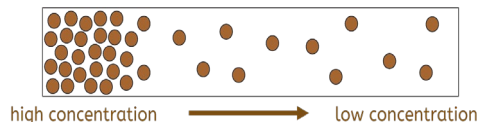
Science - Particles, substances and mixtures

The particle model of matter

	Solid	Liquid	Gas
Diagram			
Arrangement	ordered and all touching	random and all touching	random and not touching
Movement	vibrate in fixed positions	move and slide over each other	move around quickly in random directions
Attraction between particles	strong	weak	very weak

Diffusion

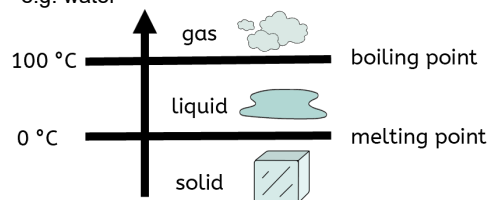
Diffusion is the random movement of particles from an area of high concentration to an area of low concentration. Particles of substances in the liquid and gas states can diffuse because their particles can move freely.



Melting and boiling points

melting point : the temperature at which a substance changes from a solid to a liquid

boiling point : the temperature at which a substance changes from a liquid to a gas, e.g. water



Explaining the properties of solids

Property	Reason
Fixed shape and cannot flow	Strong forces of attraction between the particles keep them in fixed positions.
Cannot be compressed (squashed)	Particles are all touching and have no space to move into.

Explaining the properties of liquids

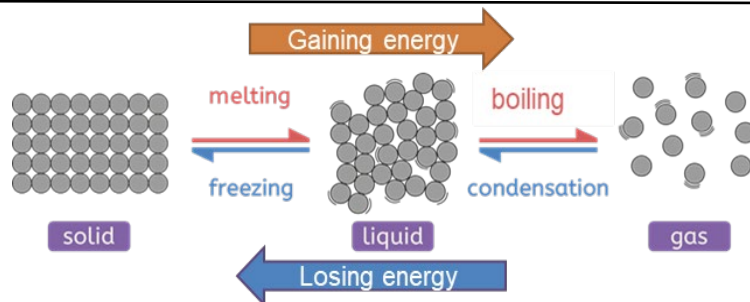
Property	Reason
Takes shape of container and can flow	Weak forces of attraction between the particles, so they can move around each other.
Cannot be compressed (squashed)	Particles are all touching and have no space to move into.

Explaining the properties of gases

Property	Reason
Takes shape of container and can flow	Very weak forces of attraction between the particles, allowing them to move and spread out.
Can be compressed (squashed)	Particles are not touching and have space to move into.

Change of state

A change of state is a physical change because no new substances are made, and the change is reversible. Only the amount of energy the particles have changes, which affects the arrangement and movement of the particles. Temperature stays constant during a change of state.



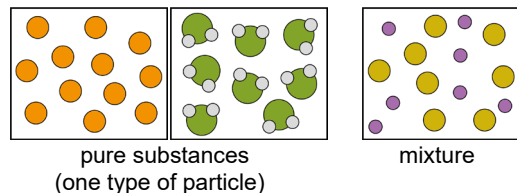
Gas pressure

When gas particles collide with the walls of their container, this creates a constant force on the walls of the container. This causes pressure. The faster the particles move, the higher the gas pressure. The gas pressure inside containers can be increased by adding more particles or increasing the temperature. The more frequent the collisions, the higher the gas pressure.



Pure substances and mixtures

A **pure substance** is one that contains only one substance, e.g. pure iron contains only iron particles. A **mixture** contains two or more substances that are not joined together and can be physically separated.

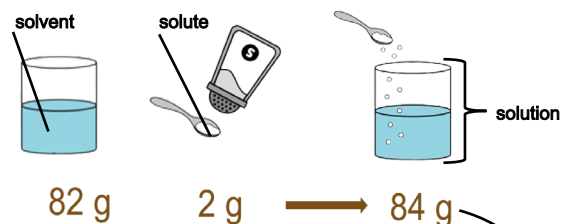


Solutions and solubility

A **solute** can be dissolved in a **solvent**. The mixture created is called a **solution**. When no more solute can dissolve in the solution, it is a **saturated** solution. If a solid dissolves in a solvent, it is **soluble**. If it does not dissolve in a solvent, it is **insoluble**. **Solubility** is a measure of how much solute can dissolve in a solvent. The higher the temperature of the solvent, the greater the mass of the solute that can be dissolved.

Solubility is different for different solutes. The solubility of a solute will change depending on the solvent used.

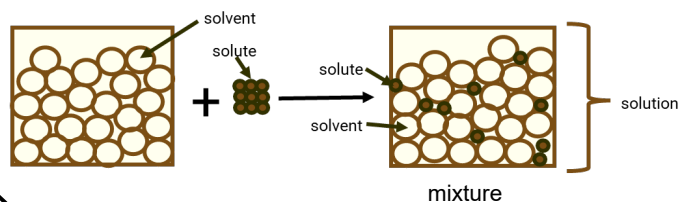
During **dissolving**, the solute particles are separated and fit between the solvent particles to make a solution.



Conservation of mass

When a solution is formed, **the mass of the solvent + the mass of the solute = the mass of the solution.**

Mass remains constant because the number of particles is the same before dissolving as it is after.

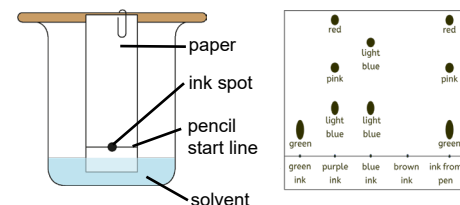


Separating mixtures

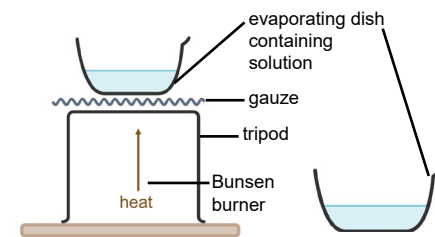
We can separate mixtures in different ways depending on their properties:

Chromatography is a separation technique that separates mixtures containing more than one solute based on their solubilities in a solvent. It works because some of the coloured substances dissolve better than others, so they travel further up the paper. A pencil line is drawn, and spots of ink or dye are placed on it. There is a container of solvent (e.g. water or ethanol). As the solvent continues to travel up the paper, the different coloured substances spread apart.

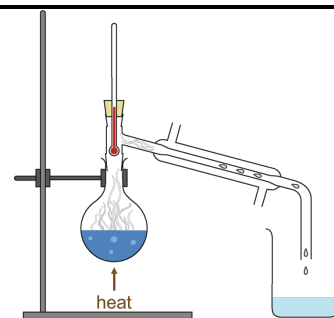
A **chromatogram**, the results of chromatography experiment.



Evaporation and **crystallisation** can be used to separate a soluble solid from a solution. For example, copper sulphate is soluble in water – its crystals dissolve in water to form a copper sulphate solution. During evaporation, the water evaporates away, leaving solid copper sulphate crystals behind. Crystallisation produces larger solid crystals.

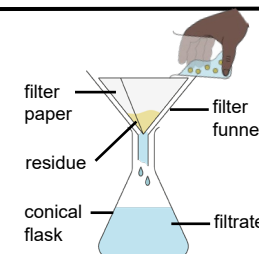


Distillation is a separation technique used to separate a mixture of liquids. The basis for separation in distillation is the difference in the boiling points of the components. For example, water can be separated from an ink and water solution because water has a much lower boiling point than ink. When the solution is heated, water evaporates. It is then cooled and condensed into a separate container. The ink does not evaporate, so it stays behind.



Filtration can be used to separate a liquid from an insoluble solid. The filter paper used in filtration is 'selectively permeable', meaning that it has holes in it that allow the movement of only some substances through whilst preventing the movement of others. The insoluble solid is unable to pass through the small holes of the filter paper. When a mixture of sand and water is filtered:

- The sand stays behind in the filter paper (it becomes the **residue**).
- The water passes through the filter paper (it becomes the **filtrate**).



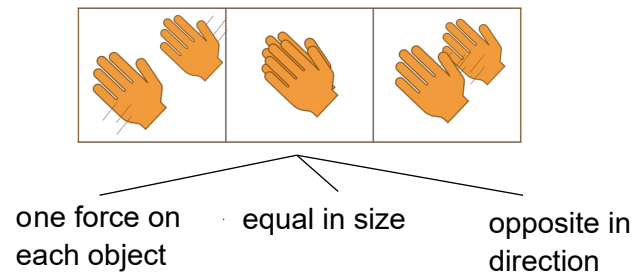
Fundamentals in physics



Forces and their interactions

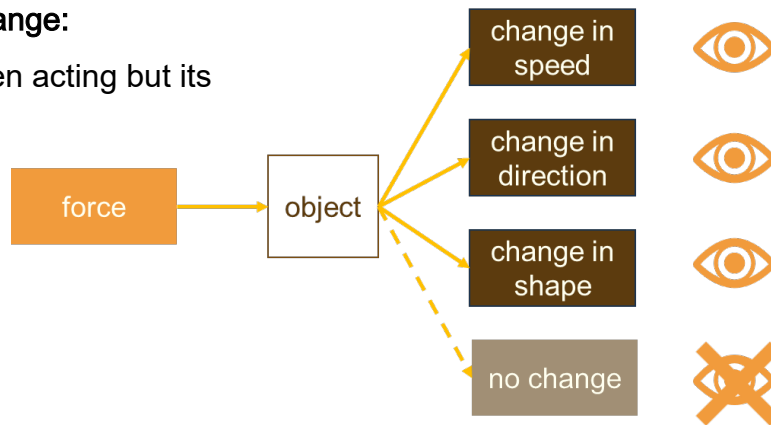
Interaction :

When two objects influence each other and cause a pair of forces to arise.



Forces can cause change:

A force cannot be seen acting but its effects often can.



Forces can be contact or non - contact:

Contact forces arise between two touching objects.

Non - contact forces can act between two objects at a distance.

contact	thrust, friction, air resistance, water resistance, normal contact, upthrust
non - contact	gravity force, magnetic force

Free- body force diagrams



upthrust force on boat by water



gravity force on boat by Earth

One object

Arrows to show size and direction of forces

Labelled forces:

- What kind of force is acting?
- What is the force acting on?
- What exerts the force?

Deforming forces



Two pushing forces cause compression: the object contracts.



Two pulling forces cause tension: the object extends.

39



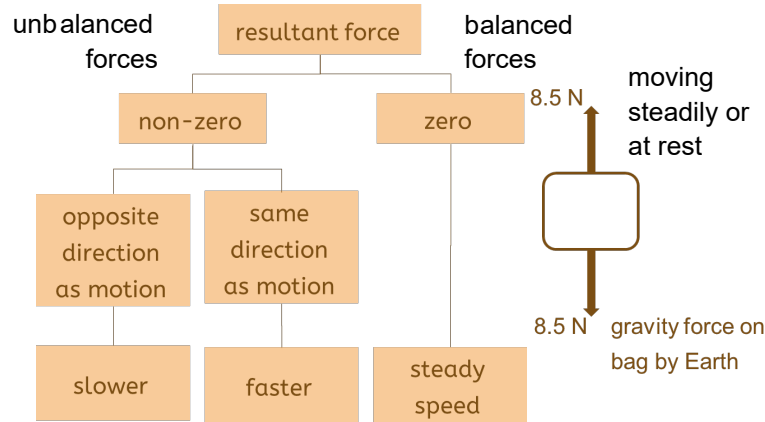
Fundamentals in physics



Combining forces

More than one force acting:

- Their effects are combined
- As if a single force is acting: the resultant force



Friction force

- **What?** One of three frictional forces. They act to resist motion.
- **Where?** Acts between solid surfaces, along the surfaces.
- **When?** An object is sliding or trying to. When starting to slide, the applied force must be larger than the limiting friction: so, an unbalanced force acts.
- **How?** Opposite direction to the motion, or the applied force.
- **Why?** Surfaces are uneven, so the 'catching' between them must be overcome.

	Useful	Nuisance
Walking	✓	
Machines		✓
Driving	✓	
Wear and tear		✓



catching;



lubricant

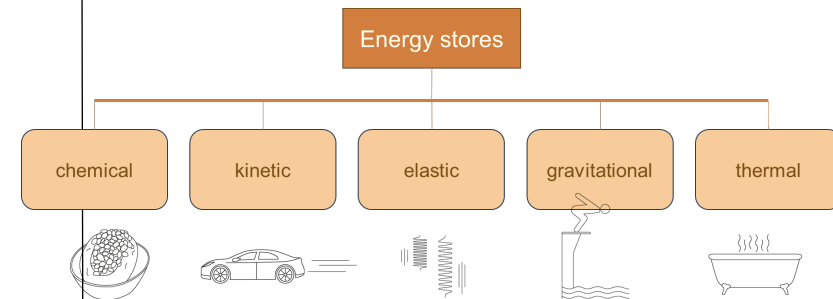
surfaces parted:
no catching

Energy stores and pathways

What energy does:

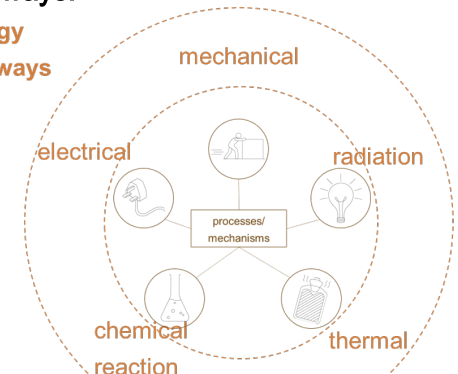
- Flows between objects in a system
- Stays the same when it transfers
- Cannot be used up

Energy is transferred between stores:



Energy is transferred because of processes, by pathways:

Energy pathways



Fundamentals in physics



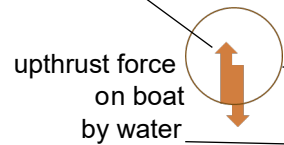
Modelling forces

Forces are modelled because:

- forces cannot be seen acting
- there are many forces acting at a time
- their size and direction have important effects on situations, so need to be shown.

Arrows (length represents size, direction of forces)

Dot or rectangle shows simplified object



Labels describe type of force, object acted on and objects exerting force on it.

Investigating forces

Scientific methods:

- With or without hypothesis
- Manipulating variables or not

Statement to answer an enquiry question.

comparative term

Smoother surfaces cause less friction to act on objects sliding over them.

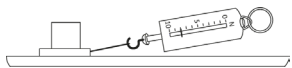
present tense

the effect which can be tested

'group' being tested (IV)

Planning to collect high-quality data:

- Measuring with skill
- Preparing the data table
- Repeatable data



Check force-meter is on zero with no force.

headings describe variable

IV

Surface	Force to start sliding (N)		
	1	2	3
Glass	1.4	1.5	1.7
Metal	1.5	1.6	1.7
Polished wood	2.0	2.3	2.2
Plastic	2.9	3.0	2.9
Paper	4.5	3.8	4.0

DV in columns

repeated

Peer review: ★★★

Peers (people of a similar level of knowledge) test the results for quality.

Repeatability:

Same group, same results

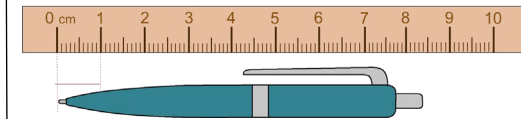
Reproducibility:

Different group, same results

Observing by measurement

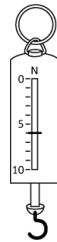
Using a scale

- set of lines at equal increments
- Labelled with numbers and units



Measuring instruments

- Include rulers, balances, clocks and thermometers.
- Force is measured using a force-meter.



Quantities: and their units

Base quantities: length (m), mass (kg), time (s) and temperature (K).

Derived quantities include force (N).

The seven common processes of living organisms

Process	Definition
movement	moving itself or its parts to change position or location
reproduction	producing offspring of the same kind
sensitivity	sensing and responding to changes in their surroundings
growth	increasing in size and repairing parts that are damaged
respiration	using oxygen and glucose (a sugar) to provide energy
excretion	removal of waste substances that are no longer needed
nutrition	using food or other nutrients like water to stay alive

Levels of organisation

cell

→

tissue

→

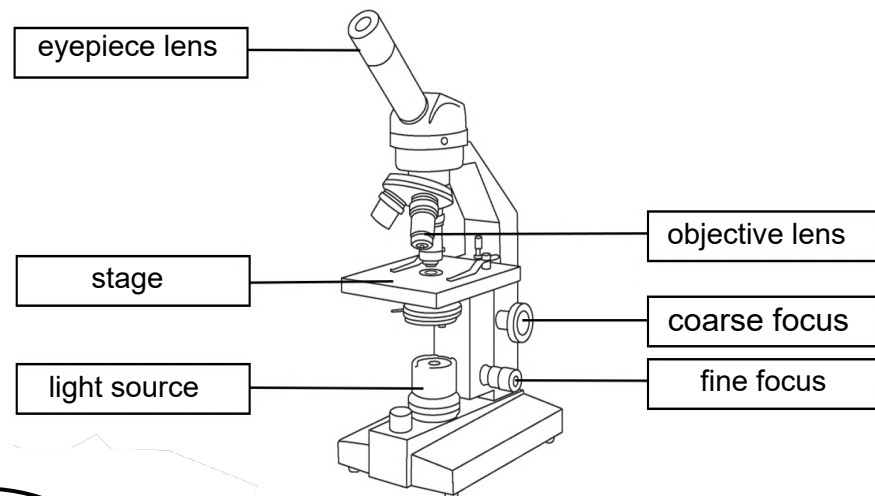
organ

→

organ system

cell	the smallest living building block of organisms
tissue	a group of similar cells that work together to perform a specific function
organ	a structure made up of different types of tissues that work together to carry out a specific function
organ system	a group of organs that work together to perform a common function

The parts of the microscope

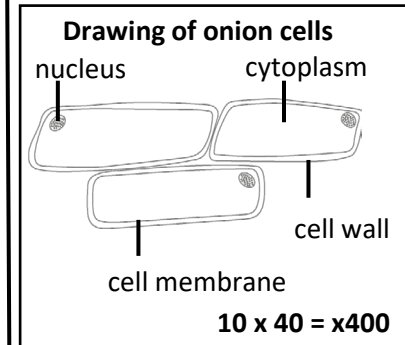


total magnification = eyepiece x objective

Using a microscope

1. Turn the **objective lens** to the **lowest magnification**.
2. Secure the slide on the **stage** using the clips.
3. Move the **stage** up to the **objective lens** by turning the **coarse focus**.
4. Look down the **eyepiece lens**, and move the stage away by turning the **coarse focus**.
5. To make the image sharper and clearer, turn the **fine focus**.
6. Rotate the **objective lens** to get a higher magnification.

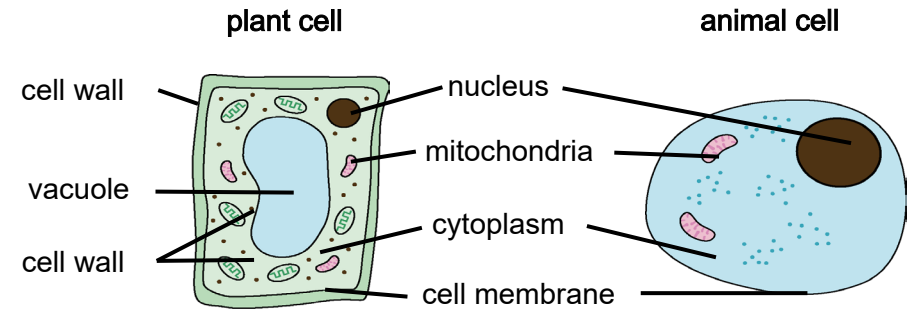
Rules for scientific drawings of cells



- smooth continuous lines
- large, with the same proportions
- stippling
- a few cells
- title and label
- total magnification

Cell organelles and their functions

nucleus	contains the genome that controls the cell's activities
cytoplasm	where the chemical reactions of the cell take place
mitochondria	where energy is released in respiration
cell membrane	controls which substances enter or leave the cell
vacuole	stores a watery sap
cell wall	strengthen and support the cell
chloroplasts	where light is trapped for photosynthesis to happen



Cells are three dimensional (3D).

The rate of diffusion

The rate of diffusion means how fast diffusion happens. Three factors that can affect the rate of diffusion are **temperature**, the **concentration** of particles and **surface area**.

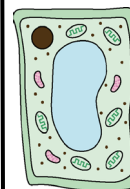
- The higher the temperature, the faster the rate of diffusion.
- The bigger the difference in the concentration of particles, the faster the rate of diffusion.
- The larger the surface area, the faster the rate of diffusion.

Needs of plants and animals for survival

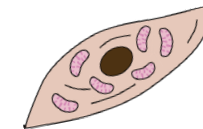
- Plants need, oxygen, water, light, carbon dioxide, minerals, a suitable temperature and space to grow.
- Animals, including humans, need water, oxygen, nutrients and the right temperature to survive.
- Plants and animals need these to keep all the cells that make them up alive and functioning properly.

Oxygen and **glucose** (a sugar) are needed for **respiration** to take place in cells, to provide energy to keep cells alive. These useful substances enter the cell by **diffusion**. Waste products of respiration are carbon dioxide and water. Waste products leave the cell by diffusion and need to be removed from cells to keep them alive.

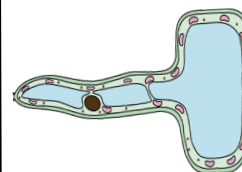
Specialised cells are adapted to carry out a specific function



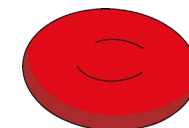
A **palisade cell** has lots of **chloroplasts** that absorb light for photosynthesis and a **column shape** to pack more in the leaf.



A **muscle cell** has lots of **mitochondria** to release energy for contraction.



A **root hair cell** has a **long cell membrane** that provides a large surface area to absorb more water and minerals.

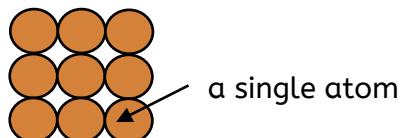


A **red blood cell** has **no nucleus** for extra space to carry more oxygen.

Chemical changes

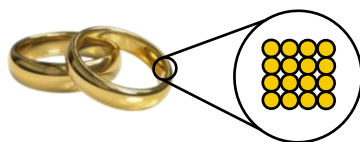
Atom

The smallest particle of matter, which all things are made of.

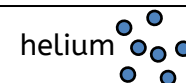


Element

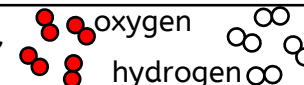
A pure substance that is made of only one type of atom. All atoms of an element are identical, e.g. Gold is an element made up of gold atoms only. The 118 known elements are listed on the periodic table of elements.



The atoms of some elements do not join together, but instead they stay as separate atoms, e.g. helium.



The atoms of other elements join together to make **molecules**, e.g. oxygen and hydrogen.



Properties of elements

Individual atoms do not have the properties of the element. The properties of an element are because of the arrangement and behaviour of the atoms as a group.

Metals	Non-metals
most are shiny	most are dull
most are hard	solid non-metals are soft and easy to cut, except carbon as diamond
most are strong	most are not strong
most are sonorous (makes a ringing sound when hit)	most are not sonorous
malleable (easy to reshape without breaking)	not malleable
most are ductile (can be drawn out into a long wire without breaking)	not ductile
most have very high melting and boiling points	most have very low melting and boiling points
some but not all are magnetic	not magnetic
conduct electricity	non-metals do not conduct electricity, except carbon as graphite
good at conducting heat	poor at conducting heat

Writing element symbols

The first letter is always written as a capital letter and if there is a second letter, it is always written as a lowercase letter. Element symbols make writing elements easier and allow scientists all over the world to communicate and write about them.

Na

O

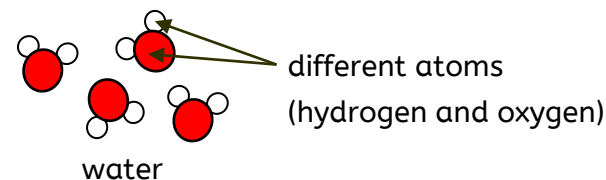
sodium oxygen



Chemical changes

Compound

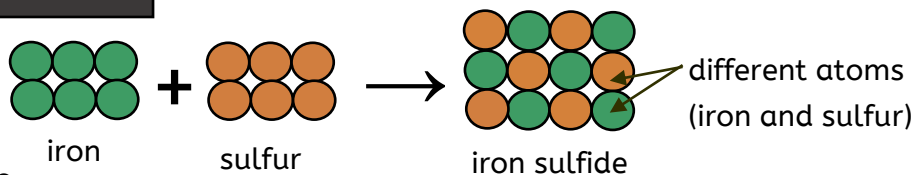
A substance made of two or more different elements chemically joined (bonded) together. A chemical bond is a strong force that holds atoms together in a compound. Lots of energy is needed to break a chemical bond. A compound cannot be easily separated. A compound may have very different properties to those of the elements from which it is made. Water is a compound of hydrogen and oxygen. Each of its molecules contains two hydrogen atoms and one oxygen atom.



Chemical reactions

When chemicals react, the atoms are rearranged.

For example, iron reacts with sulfur to



make iron sulfide. Iron sulfide, the compound formed in this reaction, has different properties to the elements it is made from.

	iron	sulfur	iron sulfide
Type of substance	element	element	compound
Colour	silvery grey	yellow	black
Is it attracted to a magnet?	yes	no	no

Conservation of mass

Atoms are not destroyed nor created during chemical reactions, so in any reaction:

Total mass of reactants = total mass of products

Naming metal and non-metal compounds

The metal element (furthest left on the periodic table) comes first in the name of the compound. The ending for the non-metal is shortened and changed to '-ide'. E.g. iron + sulfur → iron sulfide

Naming three element compounds containing oxygen

The metal element (furthest left on the periodic table) comes first in the name of the compound. If there are three elements in the compound, and one of them is oxygen, the ending of the non-metal is shortened and changed to '-ate'. E.g. lithium + nitrogen + oxygen → lithium nitrate

Chemical formulae

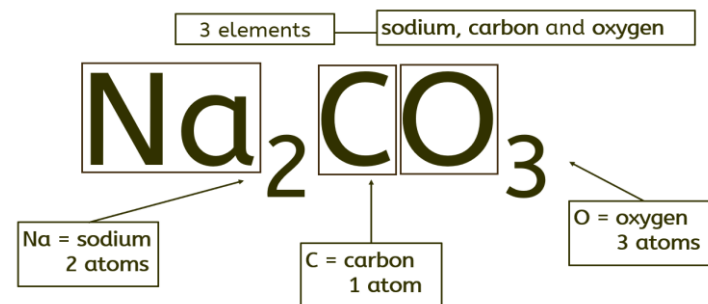
A chemical formula uses chemical symbols and numbers to show how many of each atom is present in a compound.

The small numbers (subscript) go at the bottom.

For example:

CO₂ is correct;

CO₂ and CO² are wrong.



The formula for sodium carbonate is Na₂CO₃. It tells you that sodium carbonate contains two sodium atoms (Na x 2), one carbon atom (C) and three oxygen atoms (O x 3).

Chemical changes

Chemical equations

We summarise chemical reactions using equations:

reactants → products

- **Reactants** are shown on the **left** of the arrow;
- **Products** are shown on the **right** of the arrow.

Do not write an '=' sign instead of an arrow.

If there is more than one reactant or product, they are separated by a '+' sign. For example:

copper + oxygen → copper oxide

Reactants: copper and oxygen

Products: copper oxide

A **word equation** shows the names of each substance involved in a reaction and **must not include any chemical symbols or formulae**.

Oxidation reactions

In oxidation reactions, a substance gains oxygen. Metals and non-metals can take part in oxidation reactions (be oxidised).

Magnesium reacts with oxygen to form magnesium oxide:
magnesium + oxygen → magnesium oxide
 $2\text{Mg(s)} + \text{O}_2\text{(g)} \rightarrow 2\text{MgO(s)}$

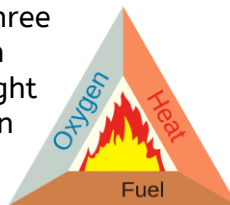
Carbon reacts with oxygen to form carbon dioxide:
carbon + oxygen → carbon dioxide
 $\text{C(s)} + \text{O}_2\text{(g)} \rightarrow \text{CO}_2\text{(g)}$

Another example is a combustion reaction, where we burn fuels in oxygen:

Fuel + oxygen → carbon dioxide + water

methane + oxygen → water + carbon dioxide

- Combustion is another name for burning fuels.
- It is an exothermic reaction.
- The fire triangle shows three components which, when combined, provide the right conditions for combustion to happen.



Thermal decomposition reactions

This is the breaking down of a substance, using heat, to form two or more products. It is an endothermic reaction. Many metal carbonates take part in thermal decomposition reactions. For example, copper carbonate:

copper carbonate is green; copper oxide is black.
copper carbonate → copper oxide + carbon dioxide
 $\text{CuCO}_3\text{(s)} \rightarrow \text{CuO(s)} + \text{CO}_2\text{(g)}$

Exothermic and Endothermic reactions

- **Exothermic** reaction - **transfers** energy to the thermal store of the surroundings. This causes a **rise** in temperature (**positive** temperature change).
- Hand warmers transfer energy to the thermal store of the surroundings by an exothermic oxidation reaction.
- **Endothermic** reaction - **transfers** energy in from the thermal store of the surroundings. This causes a **drop** in temperature (**negative** temperature change).
- Sports injury packs transfer energy from the thermal store of the surroundings by an endothermic reaction.

Temperature data collected from exothermic and endothermic reactions can be improved by:

- Using a **polystyrene** cup as an insulator, as it reduces energy transfers to or from the surroundings.
- Using a **lid** to reduce energy transferred from the surface.
- Using a **digital thermometer**, which is easier to read than a regular thermometer and, if it measures in decimal places, also has better resolution.

State symbols in chemical formulae provide information about the physical state of the reactants and products.

(s) – solid, (l) – liquid, (g) – gas, and (aq) – aqueous solution (i.e. dissolved in water).

The state symbol comes after the chemical formula and is written in lower case and in brackets. E.g. $\text{CuCO}_3\text{(s)} \rightarrow \text{CuO(s)} + \text{CO}_2\text{(g)}$

