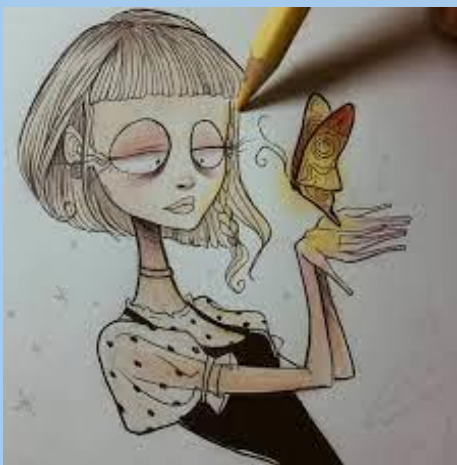
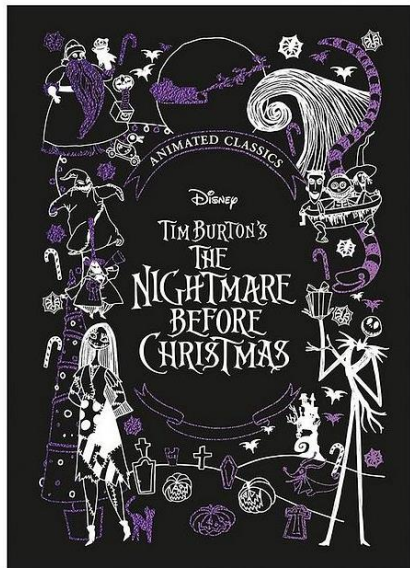


Most of Tim Burton's characters originate from poems and stories that he has created, some of which have been developed into films. A lot of the characters in his stories and poems have been inspired by feelings of being different to his peers when he was younger. He was often bullied for being different, but it is these experiences, quirks and differences that have provided inspiration for his incredibly successful career.



Facts about Tim Burton

- Tim Burton is a visionary artist, animator, producer, writer, and director who specializes in dark, gothic stories with a comedic twist. He was inspired by his childhood artwork.
- He Worked At Disney and animated some of your Disney Favourites
- Timothy Walter Burton was born on August 25th, 1958. He grew up in Burbank, California
- Burton directed his first feature-length film, Pee Wee's Big Adventure, in 1985
- After directing Pee Wee's Big Adventure and Beetlejuice, Burton went on to direct Batman, which was darker than his previous films. Batman grossed over \$100 million in its first 10 days.
- Despite his active imagination, Burton claims he never dreams—or at least he never remembers them.
- Tim Burton brings art supplies with him everywhere he goes because he is always drawing his fantastic ideas. He has a lot of sketch books, but if he doesn't have access to one, he will use tissues, napkins, and even walls to draw on.



**Colour
Palette**

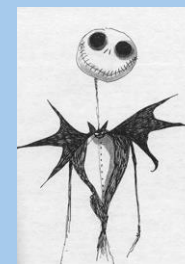


Films

Some of his most iconic movies include; The Corpse Bride, Beetlejuice, Edward Scissors Hands, Batman and The Nightmare Before Christmas. He also directed the re-makes of Alice in Wonderland and Charlie and the Chocolate Factory.



TIM BURTON



Illustrator: A person who draws or creates pictures for magazines, books, advertising, etc.

Film Director: A person who controls the making of a film and supervises the actors and technical crew.

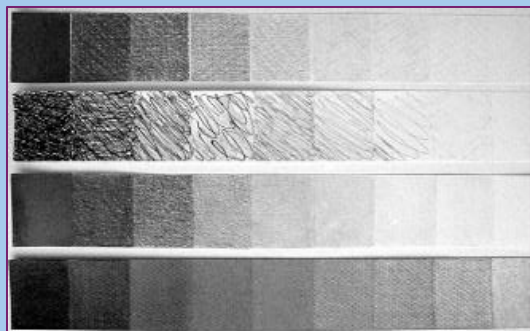
Animator: A person who makes animated films. Usually, animators make a series of drawings on paper or on the computer.



Look carefully at where the shadows fall. Blend from light to dark whilst following the shape to make the heads and bodies look 3 dimensional.

Fineliner and water

- Fineliner works well for either drawing with accuracy and detail but also for creating more expressive, energetic drawings.
- Build up darker areas and shadows with hatching and cross hatching
- Use water to smudge your lines and shading
- Keep washing your brush so that the dark areas are not dragged in to the areas that you want to keep light
- Make sure that you leave some areas white so that you have contrast and tonal range.



Body shapes

- Tim Burton's characters usually have exaggerated body shapes and unrealistic proportions. The common body shapes are long and thin bodies with big heads or short and stumpy bodies with big heads.

Facial features

- Tim Burton's characters often have creepy or gruesome features that link to the story, film or poem that they are from.
- The eyes are usually big and often have shading around them to make them look sunken.

Colours and patterns

- Colours are usually very limited.
- A lot of his work is black and white. This adds to the eerie effect.
- Striped and checked patterns are also common on the clothing of characters and in backgrounds.



Watercolour

- Use a higher ratio of water for lighter colour.
- Use a higher ratio of paint for a darker colour.
- Use water to blend two colours together and to fade from dark to light.
- Leave paint to dry before painting next to it if you require a sharp edge.
- Always hold your brush at the bottom for maximum control.

Tim Burton Common Features	
Head	
Eyes	
Nose	
Mouth	



Charles Edenshaw

- More traditional characteristics
- Haida art made for ceremonial use
- Limited colour
- Wood carved and painted
- Worked with metal to create jewellery
- Abstract animal features
- Bold use of black lines and colour

Henry Hunt

- Followed the Kwakwaka'wakw carving tradition
- Minimal paint
- Deep cuts with traditional tools showing detail
- Features of animals
- Bold black outlines
- Detailed patterns



Totem Poles are monumental sculptures carved from great trees as a symbol of a native American tribe or family.

Native Americans believe each person has an animal guide who is with them their entire lives. This is often the animal they use on their totem pole.







Where is the Pacific Northwest?



Totem poles are used for a variety of reasons and feature different animals based on the occasion. Some popular types of totem poles include storytelling poles, house frontal poles, memorial and grave poles, welcoming poles, shame poles, and healing and education poles.

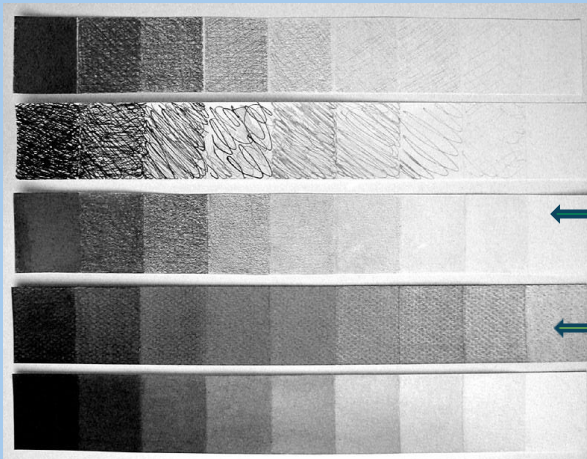
Symbolism

What do the animals mean?

	Raven	Credited for having tricked the owl and giving fire to man, putting the sun & moon in the sky and trees and rivers on land – tricky, mischievous & at times greedy
	Thunderbird	Caller of rain, mystical, leadership, known to make lightning and thunder with a blink of an eye or flap of its wings
	Whale	Hunter & commanding of the sea, family centered, wisdom, power, cleanser
	Wolf	Loyalty, success, perseverance, powerful, heals humans that are sick, teacher, pathfinder and survivalist
	Bear	Teacher, often misunderstood, welcome, friendly, strength, learned humility, motherhood
	Salmon	Provider, instinct, persistence, dependability & renewal, represents different clans,



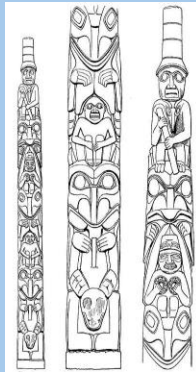
Traditionally, colour options were limited by whatever natural pigments people could find.



Tone

Tonal shading is useful when trying to make objects look 3D. You can show where there is light or shadow on an object.

In Art, **tone** refers to the **lightness or darkness** of an area. You can represent this with your shading



Pressing **lighter** on your pencil will make a **lighter tone**.

Pressing **harder** on your pencil will make a **darker tone**.

Constructi

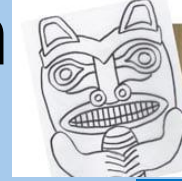
on



1.
Cylinde
r



3.
Cut out
and attach



2.

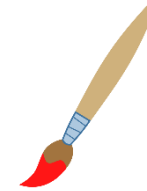
Design and shapes



Year 7 Knowledge Organiser

Colour Project

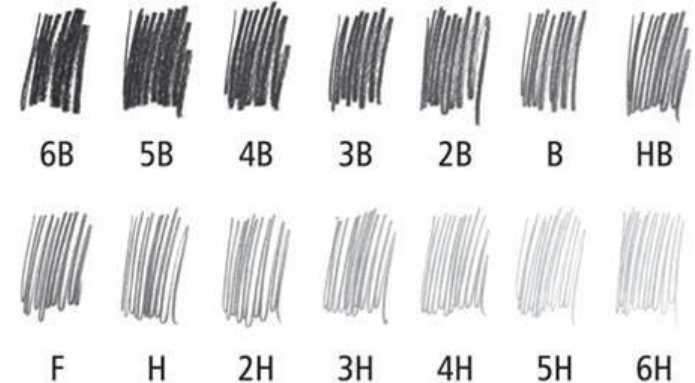
J. Vincent Scarpace



J Vincent Scarpace is an American artist whose main focus for his pieces are around sea creatures. His work is created using vibrant coloured acrylic paints. Scarpace's work focus on circular, organic shapes to create a sense of flow to his work. The use of pattern is prominent, often featuring a series of dot work and linear elements.

Grades of Pencils

Pencils come in different grades. The softer the pencil the darker the tone. H = hard, B = black (soft) In Art the most useful pencils are B, 2B and 4B. If your pencil has no grade it is likely to be an HB (hard black in the middle of the scale)



Recording from observation

Primary source-drawing something real in front of you

Secondary source-drawing from a picture

LINE	the path left by a moving point, e.g. a pencil or a brush dipped in paint. It can take many forms. e.g. horizontal, diagonal or curved.
tone	means the lightness or darkness of something. This could be a <u>shade</u> or how <u>dark</u> or <u>light</u> a <u>colour</u> appears
TEXTURE	the surface quality of something, the way something feels or looks like it feels. There are two types : <u>Actual</u> and <u>Visual</u>
SHAPE	an area enclosed by a <u>line</u> . It could be just an outline or it could be <u>shaded</u> in.
PATTERN	a design that is created by repeating <u>lines</u> , <u>shapes</u> , <u>tones</u> or <u>colours</u> . can be <u>manmade</u> , like a <u>design</u> on fabric, or <u>natural</u> , such as the markings on animal fur.
COLOUR	There are 2 types including Primary and Secondary . By mixing any two <u>Primary</u> together we get a <u>Secondary</u>

Water activates watercolour tablets. Less water means your colour will be *stronger*. More water will dilute the colour and make it *lighter*



What materials does the artist use in their work?
 How has the artist used colour in their work?
 Is the artist's work abstract?
 Where is the evidence of this?
 What is your opinion of the artists work?
 Remember to use technical language in your analysis!



Year 7 Knowledge Organiser

Education for a connected world - E-Safety

Digital personality - will affect the type of results returned to me in a search engine or on a social media stream, and intended to influence my beliefs, actions and choices.

Cyberbullying - Repeated use of digital devices (smartphones) or the Internet to deliberately upset someone else.

Coercion refers to the act of persuading someone to do something using force or other unethical means.

Radicalisation - The process by which a person comes to support terrorism and extremist ideologies associated with terrorist groups".

Grooming - is when someone builds a relationship trust and emotional connection with a child or young person so they can exploit or abuse them.

Online reputation - This is the opinion people have of you based on what you post online or other people post about you.



12 Celebrity Careers Scarred By Social Media Over Share

CELEBRITIES IRL



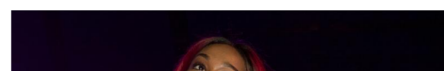
Share



Tweet

With the rise of social media, celebrities are given the opportunity to connect with fans on a more personal level and share their thoughts, feelings and events that lend insight to the kind of person they are in real life. However, sometimes they forget their public audience is in the millions and their tweets, Instagram posts and messages can get them in a lot of trouble. Check out these 12 celebs whose over share scarred their careers!

Azealia Banks



Systems Architecture

Computer components are the small parts that make up the computer system. You can find these inside the computer.

Systems Architecture

These are the components that make up the computer

Motherboard

RAM

ROM

Hard Drive

CPU

Graphics Card (GPU)

Network Interface Card (NIC)



Network Interface Card (NIC) — This allows devices to connect to a wired network by plugging in cables.

Motherboard—This is what all of the components are attached to and sends signals to all of the components.

Graphics Card - every computer has a basic one of these built into the CPU and its job is to process images. Hard disc drive (HDD) - This is a secondary storage device that is used to store things permanently when they are not being used.

The CPU stands for central processing unit. The purpose of the CPU is to process data, it does this by carrying out the fetch, decode and execute cycle.

RAM is random access memory which is temporary (Volatile) memory. This means that it only retains data whilst power is on.

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<u>RAM</u>	<u>ROM</u>
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Can be edited.	Data cannot be edited (READ ONLY).
Stores data currently being worked on.	Stores the boot up sequence (Start up instructions for a PC).
Stores applications currently in use.	

System Software - Operating systems

Operating Systems

An operating system is an important piece of software what controls the computers functions. A piece of software or program that runs a computer and other electronic devices. ***Without one your computer would not work.***

The five main jobs carried out by the operating system are:-

Peripheral Management

File Management

User Management

Provides a user interface

Memory Management



A PC/Laptop is a device that requires an operating system and it would usually be run on Windows. Other device and their operating systems are Smart phone — android, apple phone/tablet — iOS, apple Mac PC/laptop — Mac OS and then something like a games console might use Linux.

User Management provides the ability to create accounts one of which can be an administrator account. With this account you can then create more accounts for the device and for each account you can set a username and password. Also you can set permissions and restrictions for files and parts of the device these users can access.

File management - This allows you to keep things organised by creating a file system to organise files and directories. Just like having a my work folder, Year 7 and a Computer Science folder.

Interface - This is the screen you see when you are using the device. The user interface is to all people to interact with device easily. An example of a user interface is a graphical user interface which we use in school.

Memory management - transfers programs into and out of memory, allocates free space between programs, and keeps track of memory usage. So when I open up a piece of software it will add in the features as I am using them, it will also delete any features I have not used for a while to free up space. When I am working on document as soon as it is closed it will be deleted from the OS memory.

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A device driver:

- handles the translation of requests between a device and the computer
- defines where a process must put outgoing data before it can be sent, and where incoming messages will be stored when they are received
- wakes up the device when it is needed and put it back to sleep when it is not

Networks

Networks

What is a network?

A network is when you connect more than one electronic device such as two PCs together.

LAN and WAN

LAN - Spans the radius of one building or site. Owner is responsible for connections e.g. WI-FI.

WAN - Can span across town/city/country/worldwide. Use existing network infrastructure such as telephone lines and satellites.

Advantages of networks

It is easy to share documents. Different users are able to work on the same document at once.

Only one internet connection is required as it can be shared between every device connected to the network. Centralised backups can be carried out automatically. Software updates / patches can be automatically pushed out by the server to ensure that all devices are up to date. Users can log in to any machine connected to the LAN as accounts are stored centrally on the server.

Disadvantages of networks

Networks can be expensive to set up if you need to buy additional hardware.

Networks are complicated to look after and often need a specialist (Technician/network manager) to look after them. Security is an issue if one of the workstations gets a virus then it can infect the whole network.



Network hardware

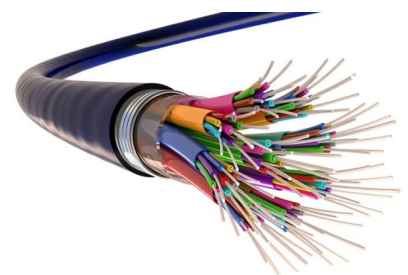
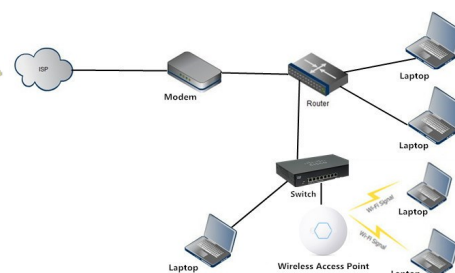
Router

Network Interface Card (NIC)

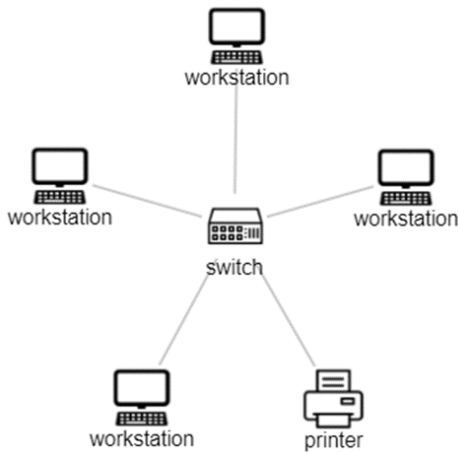
Transmission Media

Wireless Access Point (WAP)

Switches



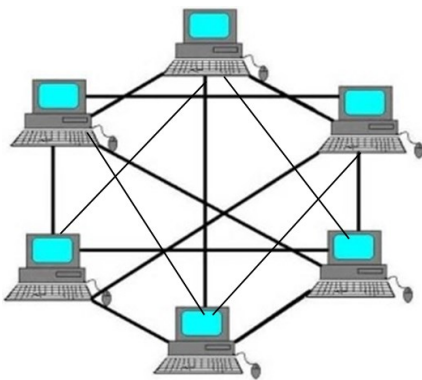
Networks



Star topologies are used in many networks, large and small.

In a star topology, all of the devices connect to a central device - usually a router or switch.

Every message has to go through the central device.



Mesh Topology—There are two types of mesh network a full and partial.

In a mesh topology, devices are connected to lots of other devices, with no central switch. Messages can find different routes. The Internet is an example of a mesh.

In a partial mesh, most devices are connected to several other devices.

In a full mesh, every device is connected to all other devices.

What are the disadvantages of using a STAR Network?

- if the central switch fails, the whole
- causes a bottleneck in a busy net-

What are the advantages of using a MESH Network?

allows packets to be routed around bottlenecks
as more reliable as a single failure won't stop the rest of the

What are some reasons why people would use a Star network?

- needs fewer cables
- is easier to add or remove devices
- is simple to understand and troubleshoot.

What are the disadvantages of using a MESH Network?

needs more cabling
is more complicated to add/remove devices
is more complicated to understand and troubleshoot.

Year 8 Knowledge Organiser



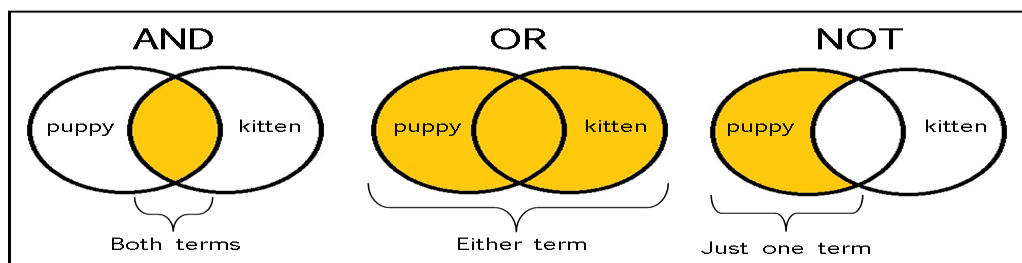
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Two possible values, states or outcomes e.g. Yes or No, True



By combining the words 'malicious' (meaning 'harmful') and 'software' we get the word 'malware'. Viruses are just one type of malware. Other types include spyware, worms and Trojans.

Viruses and malware are programs that can **attack** computers, tablets, phones and other digital devices.

A **virus** is a small program designed to cause trouble by **gaining ac-**

The three Computer Legislations are:-

1.Data Protection Act 2018

System Architecture - CPU

The purpose of the CPU is to process data. The CPU is where processes such as calculating, sorting and searching take place. Whatever is done on our computers, such as checking emails, playing games and doing homework, the CPU has processed the data we use. The CPU is made up of three main components, the control unit, the immediate access store and the arithmetic and logic unit.

The control unit

The control unit controls the flow of data within the system.

The control unit controls and monitors communications between the **hardware** attached to the computer. It controls the **input** and **output** of data, checks that signals have been delivered successfully, and makes sure that data goes to the correct place at the correct time.

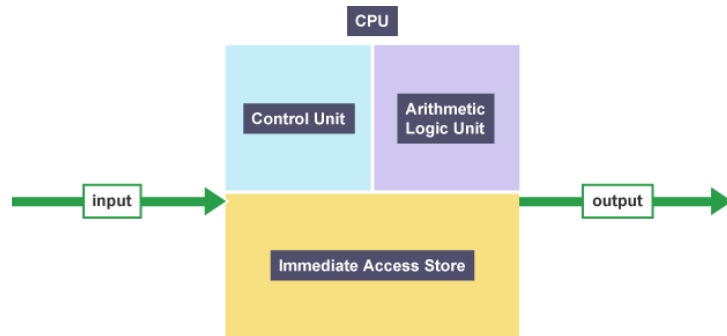
Arithmetic and logic unit

The arithmetic and logic unit (ALU) is where the CPU performs the arithmetic and logic operations. Every task that your computer carries out is completed here. Even typing into a word processor involves adding binary digits to the file, and then calculating which pixels on the screen should change so that you can see the characters. The ALU's operations fall into two parts:

- the arithmetic part, which deals with calculations, eg $1 + 2 = 3$
- the logic part, which deals with any logical comparisons, eg $2 > 1$

Cache

A cache (pronounced 'cash') is a tiny block of **memory** built right onto the processor. The most commonly used instructions and **data** are stored in the cache so that they are close at hand. The bigger the cache is, the more quickly the commonly used instructions and data can be brought into the processor and used.



CPU speed

A computer's speed is heavily influenced by the **CPU** it uses. There are three main factors that affect how quickly a CPU can carry out **instructions**:

- clock speed
- cores
- cache

The fetch-execute cycle

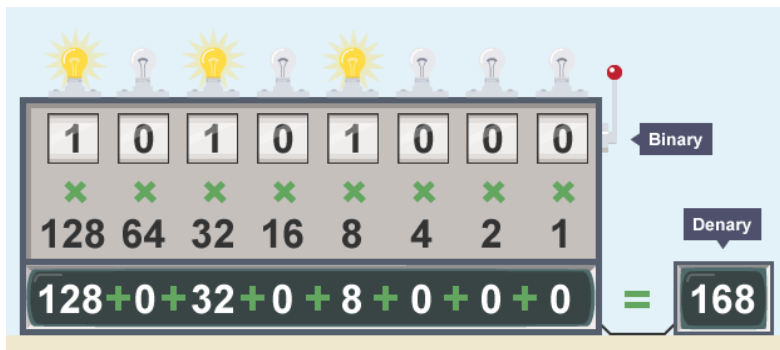
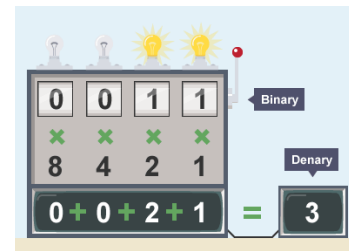
The basic operation of a computer is called the '**fetch-execute**' cycle. The CPU is designed to understand a set of **instructions** - the instruction set. It fetches the instructions from the main **memory** and **executes** them. This is done repeatedly from when the computer is booted up to when it is shut down.

1. The CPU fetches the instructions one at a time from the main memory into the registers. One register is the program counter (pc). The pc holds the memory address of the next instruction to be fetched from main memory.
2. The CPU **decodes** the instruction.
3. The CPU **executes** the instruction.
4. Repeat until there are no more instructions.

Data storage

The **binary** system on computers uses combinations of 0s and 1s. In everyday life, we use numbers based on combinations of the digits between 0 and 9. This counting system is known as **decimal**, **denary** or **base 10**.

A number **base** indicates how many digits are available within a numerical system. Denary is known as **base 10** because there are ten choices of digits between 0 and 9. For binary numbers there are only two possible digits available: 0 or 1. The binary system is also known as **base 2**.



Binary

Base 2

Computers Language

1 = Yes/On/True

0 = No/Off/False

Denary

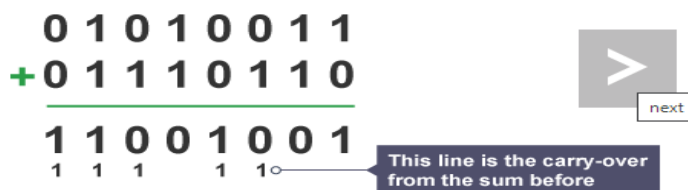
Human Counting System

Base 10

Decimal

128	64	32	16	8	4	2	1
1	0	0	1	0	1	0	0

So you can see that there is 1 lot of 128, 1 lot of 16 and 1 lot of 4.



We can then work out $128 + 16 + 4 = 148$ which means that the binary 10010100 is 148 in denary (decimal).

$128 + 16 + 4 = 148$ OR 10010100

Adding binary

When two numbers are added together in **denary**, we take the first number, add the second number to it and get an answer. For example, $1 + 2 = 3$.

When we add two **binary** numbers together the process is different.

There are four rules that need to be followed when adding two binary numbers. These are:

- $0 + 0 = 0$
- $1 + 0 = 1$
- $1 + 1 = 10$ (said one zero and is binary for 2)

Introduction to Computer Systems - Components

Computer components are the small parts that make up the computer system. You can find these inside the computer.

Systems Architecture

These are the components that make up the computer

Motherboard

RAM

ROM

Hard Drive

CPU

Graphics Card (GPU)

Network Interface Card (NIC)



Power supply unit - this is where you attach a plug and lead to your PC and it sends electrical power into the PC in order for it to work. Motherboard - This is a circuit board which all of the other components are attached to in an organized way. A network interface card (NIC) - allows a computer to connect to a wired network.

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Year 9 Knowledge Organiser

Education for a connected world - E-Safety

Privacy and Security

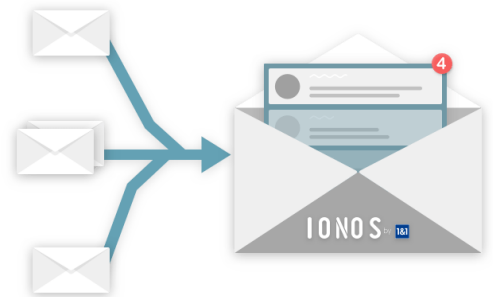
Scams

Vishing—A phone call from a fraudster posing as an employee of a reputable company or organisation, who will come up with a plausible story to get you to share your financial/personal information. They can fake their telephone number and do some basic research online to get unique details about you to sound more convincing.

Social engineering—Fraudsters manipulate or trick people into exposing their personal or financial information, through fake emails, phone calls, text, posts on social media. These can be very complex attacks, some combining various sources of information about you to appear more convincing.

Phishing— Fraudsters send emails or text messages that appear to be from a genuine company. They typically ask you to make urgent contact via a telephone number within the text or via a website address, due to an unauthorised payment.

Online scams—Scammers advertise goods or services that don't exist or aren't theirs to sell. They convince you to send the payment directly to their bank but the goods never arrive, or are not as advertised.



Compromising devices when connected to the Internet

What can be compromised? webcams, monitors, phones or toys.

How can devices be compromised?

Malware, Phishing, Brute Force, Denial of Service (DOS), Data interception and theft.

Education for a connected world - E-Safety



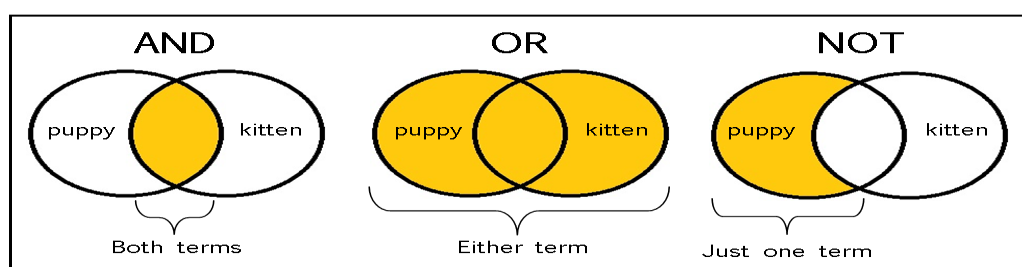
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By combining the words 'malicious' (meaning 'harmful') and 'software' we get the word 'malware'. Viruses are just one type of malware. Other types include spyware, worms and Trojans.

Viruses and malware are programs that can **attack** computers, tablets, phones and other digital devices.

A **virus** is a small program designed to cause trouble by **gaining access to your device**. It can copy your personal data or slow your device down. A virus spreads by duplicating and attaching itself to other files.

System Architecture - CPU

The purpose of the CPU is to process data. The CPU is where processes such as calculating, sorting and searching take place. Whatever is done on our computers, such as checking emails, playing games and doing homework, the CPU has processed the data we use. The CPU is made up of three main components, the **control unit**, the **immediate access store** and the **arithmetic and logic unit**.

The control unit

The control unit controls the flow of data within the system.

The control unit controls and monitors communications between the **hardware** attached to the computer. It controls the **input** and **output** of data, checks that signals have been delivered successfully, and makes sure that data goes to the correct place at the correct time.

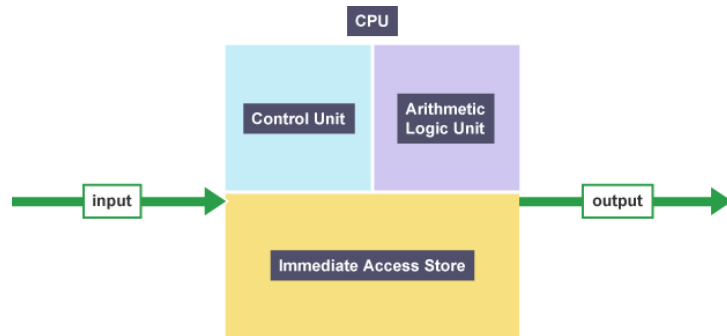
Arithmetic and logic unit

The **arithmetic and logic unit (ALU)** is where the CPU performs the **arithmetic and logic operations**. Every task that your computer carries out is completed here. Even typing into a word processor involves adding binary digits to the file, and then calculating which pixels on the screen should change so that you can see the characters. The ALU's operations fall into two parts:

- the arithmetic part, which deals with calculations, eg $1 + 2 = 3$
- the logic part, which deals with any logical comparisons, eg $2 > 1$

Cache

A cache (pronounced 'cash') is a tiny block of **memory** built right onto the processor. The most commonly used instructions and **data** are stored in the cache so that they are close at hand. The bigger the cache is, the more quickly the commonly used instructions and data can be brought into the processor and used.



CPU speed

A computer's speed is heavily influenced by the **CPU** it uses. There are three main factors that affect how quickly a CPU can carry out **instructions**:

- clock speed
- cores
- cache

The fetch-execute cycle

The basic operation of a computer is called the '**fetch-execute**' cycle. The CPU is designed to understand a set of **instructions** - the instruction set. It fetches the instructions from the main **memory** and **executes** them. This is done repeatedly from when the computer is booted up to when it is shut down.

1. The CPU fetches the instructions one at a time from the main memory into the registers. One register is the program counter (pc). The pc holds the memory address of the next instruction to be fetched from main memory.
2. The CPU **decodes** the instruction.
3. The CPU **executes** the instruction.
4. Repeat until there are no more instructions.

Networks

Networks

What is a network?

A network is when you connect more than one electronic device such as two PCs together.

LAN and WAN

LAN - Spans the radius of one building or site. WAN - Can span across town/city/country/worldwide.

Security Threats

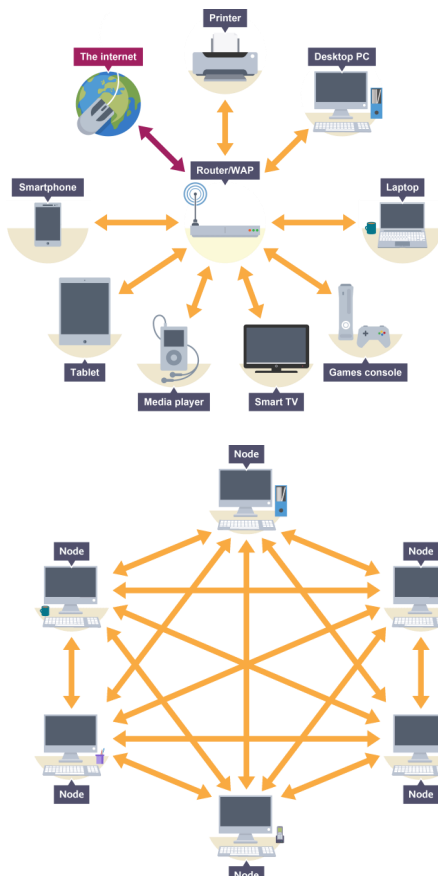
Spyware is mostly used for the stealing information like usernames and passwords and storing Internet users' movements. You can prevent this using Anti-Spyware software.

Malware is malicious software that deletes, modifies or steals data. You can prevent this with software such as Anti-Virus.

Phishing is when a fake email is sent trying to trick the user into sharing their bank details. It can be prevented by using a SPAM (Junk folder) filter on your email account.

A Brute-Force attack is when someone tries to hack into a device/network by guessing your username and password. You can prevent this by having a strong password or a Firewall.

DDOS—Distributed Denial of Service attack is when too much traffic is sent to a server (SPAMMING) to try and make it crash. A way to prevent this is to carry out penetration testing to



Star topologies are used in many networks, large and small.

In a star topology all nodes indirectly connect to each other through one or more switches. The switch acts as a central point

In a mesh topology there is no central connection point. Instead, each node is connected to at least one other node and usually to more than one. Each node is capable of sending messages to and receiving messages from other nodes. The nodes act as relays, passing on a message towards its final destination.

There are two types of mesh topology:

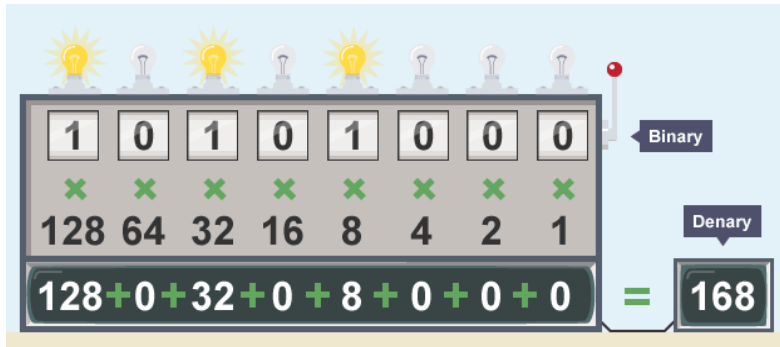
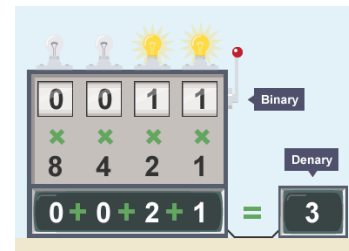
- full mesh topology
- partial mesh topology

Mesh networks are becoming increasingly popular due to their

Data storage

The **binary** system on computers uses combinations of 0s and 1s. In everyday life, we use numbers based on combinations of the digits between 0 and 9. This counting system is known as **decimal**, **denary** or **base 10**.

A number **base** indicates how many digits are available within a numerical system. Denary is known as **base 10** because there are ten choices of digits between 0 and 9. For binary numbers there are only two possible digits available: 0 or 1. The binary system is also known as **base 2**.



Binary

Base 2

Computers Language

1 = Yes/On/True

0 = No/Off/False

Denary

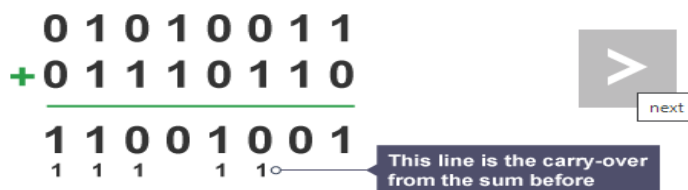
Human Counting System

Base 10

Decimal

128	64	32	16	8	4	2	1
1	0	0	1	0	1	0	0

So you can see that there is 1 lot of 128, 1 lot of 16 and 1 lot of 4.



We can then work out $128 + 16 + 4 = 148$ which means that the binary 10010100 is 148 in denary (decimal).

$128 + 16 + 4 = 148$ OR 10010100

Adding binary

When two numbers are added together in **denary**, we take the first number, add the second number to it and get an answer. For example, $1 + 2 = 3$.

When we add two **binary** numbers together the process is different.

There are four rules that need to be followed when adding two binary numbers. These are:

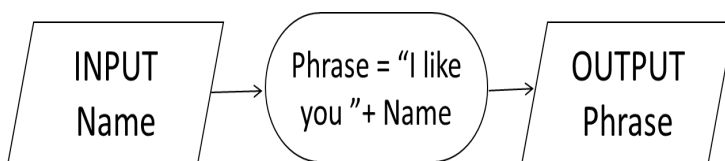
- $0 + 0 = 0$
- $1 + 0 = 1$
- $1 + 1 = 10$ (said one zero and is binary for 2)

Programming fundamental - edublocks

Python is a high level programming language. This means that when we use it to write programs it is close but not the same to the English language.

The key words for the next few lessons are: -

Input
Output
Data Type
Variable
Constant
Operator

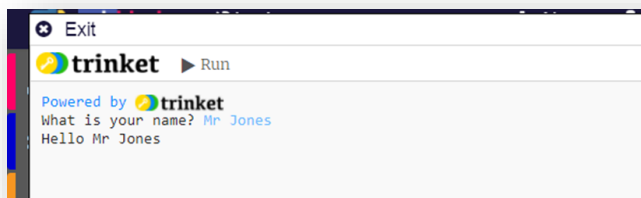


Here a variable has been "assigned" under the identifier Name, we have used the operator =

We have also used input and printed a message requesting you enter your name. We have then outputted a message using the variable.



This shows what happens when we run the program - test the code.



Without inputs, our programs are not very useful as they can't interact with the outside world and always produce the same result.

We are going to create a program that asks user to input their name and then greets them by concatenating (joining) their name with a greeting.

Inputs come from the console, from a file, or from elsewhere in a modular program - then they are known as 'parameters'.

Computer programs accept inputs from a user, process them using some constants and output back to the user. It is a good idea to label various inputs, constants and outputs with descriptive names (the process known as assignment). None of them should start with a number or contain spaces.

Programs are made up of basic building blocks known as constructs (concepts). The three basic programming constructs are:-

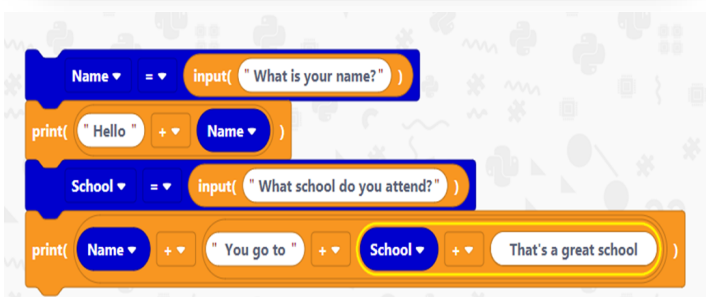
Sequence

Selection

Iteration

Sequencing allows a programmer to solve complex tasks through a number of simple steps.

The order of steps in most tasks matters - similarly, we use brackets in maths to make sure that certain operations are done before others (sometimes we need to add before we do multiplication and division).



Addition e.g. $x = 6 + 5$ gives 11

Subtraction e.g. $x = 6 - 5$ gives 1

Multiplication e.g. $x = 12 * 2$ gives 24

Division e.g. $x = 12 / 2$ gives 6

Modulus e.g. $12 \text{ MOD } 5$ gives 2

MOD %

Introduction to Computer Systems - Components

Computer components are the small parts that make up the computer system. You can find these inside the computer.

Systems Architecture

These are the components that make up the computer

Motherboard

RAM

ROM

Hard Drive

CPU

Graphics Card (GPU)

Network Interface Card (NIC)



Power supply unit - this is where you attach a plug and lead to your PC and it sends electrical power into the PC in order for it to work. Motherboard - This is a circuit board which all of the other components are attached to in an organized way. A network interface card (NIC) - allows a computer to connect to a wired network.

Graphics Card - every computer has a basic one of these built into the CPU and its job is to process images. Hard disc drive (HDD) - This is a secondary storage device that is used to store things permanently when they are not being used.

The CPU stands for central processing unit. The purpose of the CPU is to process data, it does this by carrying out the fetch, decode and execute cycle.

RAM is random access memory which is temporary (Volatile) memory. This means that it only retains data whilst power is on.

ROM is read only memory which is permanent (Non-volatile) memory. This means it retains data without power.

<u>RAM</u>	<u>ROM</u>
Is volatile - means it stores data temporarily (only when it has power).	Is non-volatile - means it stores data without power (permanently).
Can be edited.	Data cannot be edited (READ ONLY).
Stores data currently being worked on.	Stores the boot up sequence (Start up instructions for a PC).
Stores applications currently in use.	

System Software - Operating systems

Operating Systems

An operating system is an important piece of software what controls the computers functions. A piece of software or program that runs a computer and other electronic devices. ***Without one your computer would not work.***

The five main jobs carried out by the operating system are:-

Peripheral Management

File Management

User Management

Provides a user interface

Memory Management



A PC/Laptop is a device that requires an operating system and it would usually be run on Windows. Other device and their operating systems are Smart phone — android, apple phone/tablet — iOS, apple Mac PC/laptop — Mac OS and then something like a games console might use Linux.

The operating system provides the ability to create accounts one of which can be an administrator account. With this account you can then create more accounts for the device and for each account you can set a username and password. Also you can set permissions and restrictions for files and parts of the device these users can access.

File management - This allows you to keep things organised by creating a file system to organise files and directories. Just like having a my work folder, Year 7 and a Computer Science folder.

Interface - This is the screen you see when you are using the device. The user interface is to all people to interact with device easily. An example of a user interface is a graphical user interface which we use in school.

Memory management - transfers programs into and out of memory, allocates free space between programs, and keeps track of memory usage. So when I open up a piece of software it will add in the features as I am using them, it will also delete any features I have not used for a while to free up space. When I am working on document as soon as it is closed it will be deleted from the OS memory.

The **OS** uses programs called **device drivers** to manage connections with peripherals.

A device driver:

- handles the translation of requests between a device and the computer
- defines where a process must put outgoing data before it can be sent, and where incoming messages will be stored when they are received
- wakes up the device when it is needed and put it back to sleep when it is not

GHOST BOYS KNOWLEDGE ORGANISER

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KEY CHARACTERS

Jerome - Jerome is the main character who tells the story through a first-person narrative. He is shot and killed by Officer Moore at the beginning of the book.

Carlos - Carlos is a new student at Jerome's school. He is there when Jerome is shot.

Sarah - Sarah is Officer Moore's daughter.

Kim - Kim is Jerome's younger sister.

Officer Moore - Officer Moore is a police officer who shoots and kills Jerome. He has to go to trial for it.

Ma - Ma is Jerome's mother.

Pa - Pa is Jerome's father.

Grandma - Grandma is Jerome's grandmother who lives with them.

THE AUTHOR

Dr. Jewell Parker Rhodes is a pioneering creator in her content for children's books. Despite writing literature targeting a young audience, Dr. Rhodes's books hint at and raise awareness on bigger and more controversial matters – namely – the issue of social inequality. Her works are valuable to the movement to end racism because they successfully target young readers – a non-judgmental population – with youth-friendly language and their ability to raise awareness on social inequality.

Further Reading:

Towers Falling

Black Brother, Black Brother

Sugar

Soul Step

Bayou Magic

KEY WORDS

Justice - giving each person what he or she deserves so that everything is fair.

Injustice - unfair treatment : a situation in which the rights of a person or a group of people are ignored.

Discrimination - the unfair or prejudicial treatment of people and groups based on characteristics such as race, gender, age, or sexual orientation.

Grief - intense sorrow, especially caused by someone's death.

Empathy - the ability to understand and share the feelings of another.

Racism - someone who believes that their race makes them better, more intelligent, more moral, etc. than people of other races and who does or says unfair or harmful things as a result.

Controversial - when you say something that describes someone or something that causes people to get upset and argue.

Judgemental - a negative word to describe someone who often rushes to judgment without reason.

Social inequality - the existence of unequal opportunities and rewards for different types of people in society.



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FURTHER LEARNING

Civil Rights' Movement - The civil rights movement was a struggle for justice and equality for African Americans that took place mainly in the 1950s and 1960s.

Martin Luther King - Martin Luther King Jr. was an American Baptist minister, activist, and political philosopher who was one of the most prominent leaders in the civil rights movement from 1955 until his assassination in 1968.

Rosa Parks - Rosa Louise McCauley Parks was an American activist in the civil rights movement, best known for her pivotal role in the Montgomery bus boycott. The United States Congress has honoured her as "the first lady of civil rights" and "the mother of the freedom movement".

Emmet Till - Emmett Louis Till was an African American teenaged boy who was abducted, tortured, and lynched in Mississippi in 1955 after being accused of offending a white woman, Carolyn Bryant, in her family's grocery store.

Tamir Rice - in 2014, Tamir Rice, a boy of 12, was shot dead in Cleveland, Ohio by a police officer after reports of a male who was "probably a juvenile" pointing a gun that was "probably fake" at passers by. His death sparked protests across America.

Racial bias - Racial bias is a personal and sometimes unreasoned judgement made solely on an individual's race.

Racial segregation - Racial segregation is the separation of people into racial or other ethnic groups in daily life.

Day of the Dead - The Day of the Dead is a holiday traditionally celebrated on November 1 and 2, though other days, such as October 31 or November 6, may be included depending on the locality. It is widely observed in Mexico, where it largely developed, and is also observed in other places, especially by people of Mexican heritage.

Black Lives Matter - Black Lives Matter is a decentralized political and social movement that seeks to highlight racism, discrimination, and racial inequality experienced by black people and to promote anti-racism. Its primary concerns are police brutality and racially motivated violence against black people.

KEY TECHNIQUES

Show not Tell - when you describe something in detail instead of simply explaining it, e.g. 'I froze' instead of 'I was scared.'

Metaphor - when you compare something to something else, e.g. 'He's a firework.'

Simile - when you compare something to something else using 'like' or 'as,' e.g. 'He's as tall as a tree.'

Personification - when you make something that isn't human sound human, e.g. 'The trees waved at me.'

Alliteration - a series of words that begin with the same consonant, e.g. 'The dirty dog danced in the mud.'

Rhetorical question - a question that doesn't need an answer, e.g. 'What do you think you're doing?'

Repetition - when you repeat a word or phrase to create an effect, e.g. 'It's not right, it's not fair, it's not okay.'

Emotive Language - when you deliberately use words or phrases to make the reader feel a certain emotion, e.g. saying 'horrific and devastating loss' instead of 'death.'

Exaggeration - making something sound better or worse than it actually is, e.g. 'This is the best day ever.'

Triplet - three similar words or phrases in a row for effect, e.g. 'It is amazing, fantastic and wonderful.'

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KEY CHARACTERS

Danny - Danny is the main character of the book. He lives with his mother, Cathy, and has experienced domestic abuse at the hands of her boyfriend, Chris.

Cathy - Cathy is Danny's mother. She had Danny at a young age and moved to London where she met Chris.

Chris - Chris is Cathy's boyfriend. He is abusive towards her and Danny.

Harry - Harry is Cathy's father and Danny's grandfather.

Joan - Joan is Cathy's mother and Danny's grandmother.

Nikki - Danny meets Nikki at his new school.

Steve - Steve is a known bully at Danny's new school.

THE AUTHOR

Alan Gibbons (born 14 August 1953) is an English writer of children's books and campaigner known for his advocacy of libraries.

He has written over 60 books and won a number of awards including a Blue Peter Book Award for his best-selling book *Shadow of the Minotaur*.

Gibbons lives in Liverpool, England, where he worked as a primary school teacher and where he is a local councillor.

Further Reading:

They Saw too Much

The Trap

Home Ground

An Act of Love

Rise of the Blood Moon

KEY WORDS

Resentful - feeling or expressing bitterness or indignation at having been treated unfairly.

Possessive - demanding someone's total attention and love.

Misogynistic - strongly prejudiced against women.

Prejudice - an unfair feeling of dislike for a person or group because of race, sex, religion, etc.

Empathy - the ability to understand and share the feelings of another.

Racism - someone who believes that their race makes them better, more intelligent, more moral, etc. than people of other races and who does or says unfair or harmful things as a result.

Discrimination - the unfair or prejudicial treatment of people and groups based on characteristics such as race, gender, age, or sexual orientation.

Tension - a feeling of nervousness, expecting something to happen.

Suspense - a state or feeling of excited or anxious uncertainty about what may happen.



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FURTHER LEARNING

Social class divide - social class refers to a group of people with similar levels of wealth, influence, and status. The 'divide' refers to the inequality that exists between the 'classes' - lower, middle and upper.

Racial discrimination - racial discrimination is any discrimination against any individual on the basis of their race, ancestry, ethnicity, and/or skin colour and hair texture. Individuals can discriminate by refusing to do business with, socialise with, or share resources with people of a certain group.

Domestic abuse - an incident or pattern of incidents of controlling, coercive, threatening, degrading and violent behaviour, in the majority of cases by a partner or ex-partner, but also by a family member or carer.

Cultural divide - a cultural divide refers to a separation or distinction between different groups of people based on their cultural characteristics, such as religion, language, or customs. It is a boundary line that links with these cultural differences.

Racial bias - racial bias is a personal and sometimes unreasoned judgement made solely on an individual's race.

Unconscious bias - this term describes what happens when racial assumptions and stereotypes are present in our minds. They can then manifest in our behaviours. These are not thoughts and ideas we keep to ourselves because we know they're wrong. This happens when we're not even aware of it, often despite our best intentions.

Toxic relationships - a toxic relationship is one that consistently undermines your sense of wellbeing, happiness, and, at times, safety. Occasional disagreements or conflicts are normal in any relationship, but a continual pattern of emotional harm, disrespect, and manipulation can lead to deterioration in mental and emotional health.

PTSD - Post-traumatic stress disorder (PTSD) is a disorder that develops in some people who have experienced a shocking, scary, or dangerous event.

KEY TERMS

Inference - your explanation of your understanding of a character/situation based on evidence (your quotations).

Show not Tell - when you describe something in detail instead of simply explaining it, e.g. 'I froze' instead of 'I was scared.'

Metaphor - when you compare something to something else, e.g. 'He's a firework.'

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Exaggeration - making something sound better or worse than it actually is, e.g. 'This is the best day ever.'

Triplet - three similar words or phrases in a row for effect, e.g. 'It is amazing, fantastic and wonderful.'

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KEY CHARACTERS

Malala - Malala Yousafzai is an equal rights' activist from Pakistan. She was shot in the head when she was 15 and now lives in the UK.

Ziauddin - Ziauddin Yousafzai is Malala's father. He owned a school in Pakistan and also campaigns for equal rights.

Toor Pekai - Toor Pekai Yousafzai is Malala's mother. She was not educated as a child due to the laws against education females in Pakistan at the time.

Khushal - Khushal Yousafzai is the older of Malala's two younger brothers.

Atal - Atal Yousafzai is Malala's youngest brother.

Fazal Hayat - more commonly known by his pseudonym Mullah Fazlullah, was an Islamist militant who was the leader of the Tehreek-e-Nafaz-e-Shariat-e-Mohammadi, and was the leader of the Tehreek-e-Taliban Pakistan in Swat Valley.

Safina - she is Malala's friend who lives next door.

Moniba - Malala's friend from school.

Shazia - Malala's friend from school. She was also shot when Malala was shot.

THE AUTHOR

Malala Yousafzai, (born 12 July 1997) is a Pakistani female education activist and the 2014 Nobel Peace Prize laureate at the age of 17. She is the youngest Nobel Prize laureate in history, the second Pakistani and the only Pashtun to receive a Nobel Prize. She is a human rights advocate for the education of women and children in her native homeland, Swat, where the Pakistani Taliban had at times banned girls from attending school. Her advocacy has grown into an international movement, and according to former Prime Minister Shahid Khaqan Abbasi, she has become Pakistan's "most prominent citizen."

Further Reading:

For the Right to Learn: Malala Yousafzai's Story
Malala Yousafzai: Warrior with Words

The Night Diary

Amal Unbound

Amina's Voice

KEY WORDS

Muslim - people who follow Islam are called Muslims. Muslims believe that there is only one God. The Arabic word for God is Allah.

Mosque - a place of worship for Muslims. The term usually refers to a covered building, but can be any place where Islamic prayers are performed, such as an outdoor courtyard.

Shalwar Kamiz - a type of suit, worn especially by Asian women, with loose pants and a long shirt.

Jani - a Persian word for 'dear one.'

Aba - a Pashto word meaning 'father'.

Pashtun - a group of people local to northwest Pakistan and southern and eastern Afghanistan.

Pisho - a Pashto word for 'kitten.'

Pakistan - a country in South Asia.

Mingora - a city in the Swat District of Khyber Pakhtunkhwa, Pakistan.

Taliban - an Islamic political and military organization, active in Afghanistan and Pakistan

Burqa - the full Arabic ensemble that covers the woman head to toe, including a veil that exposes only the eyes.

Niqab - a long garment worn by some Muslim women in order to cover their entire body and face, excluding their eyes.

Quran - The Quran, is the religious text of Islam, believed by Muslims to be a revelation directly from God.

Sharia - religious regulations governing the lives of Muslims. For many Muslims, the word means simply "justice," and they will consider any law that promotes justice and social welfare to conform to Sharia.

Haram - when something is forbidden by Islamic law.

Activist - a person who campaigns to bring about political or social change.

Discrimination - the unjust or prejudicial treatment of different categories of people, especially on the grounds of ethnicity, age, sex, or disability.

Deprivation - the damaging lack of material benefits considered to be basic necessities in a society.

Misconceptions - a view or opinion that is incorrect because based on faulty thinking or understanding.

Suppression - the act of keeping something from happening.

Radicalisation - the action or process of causing someone to adopt radical positions on political or social issues.

Democracy - a system of government by the whole population or all the eligible members of a state, typically through elected representatives.

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FURTHER LEARNING

Islam - Islam is the second largest religion in the world with over 1 billion followers. The 2001 census recorded 1,591,000 Muslims in the UK, around 2.7% of the population. Muslims believe that there is only one God - Allah.

Ramadan - Ramadan is the ninth month of the Islamic calendar, observed by Muslims worldwide as a month of fasting, prayer, reflection, and community.

Quran - The Holy Quran is a compilation of the verbal revelations given to the Holy Prophet Muhammad over a period of twenty three years. The Holy Quran is the Holy Book or the Scriptures of the Muslims. It lays down for them the law and commandments, codes for their social and moral behaviour, and contains a comprehensive religious philosophy. The language of the Quran is Arabic.

The Taliban - an ultraconservative political and religious faction that emerged in Afghanistan in the mid-1990s following the withdrawal of Soviet troops, the collapse of Afghanistan's communist regime, and the subsequent breakdown in civil order. It began as a small force of Afghan religious students and scholars seeking to confront crime and corruption; the faction owes its name, Taliban, to this initial membership.

Human rights - human rights are moral principles, or norms, for certain standards of human behaviour and are regularly protected as substantive rights in substantive law, municipal and international law.



KEY TERMS

Inference - your explanation of your understanding of a character/situation based on evidence (your quotations).

Empathy - the ability to understand and share the feelings of another.

Show not Tell - when you describe something in detail instead of simply explaining it, e.g. 'I froze' instead of 'I was scared.'

Metaphor - when you compare something to something else, e.g. 'He's a firework.'

Simile - when you compare something to something else using 'like' or 'as,' e.g. 'He's as tall as a tree.'

Personification - when you make something that isn't human sound human, e.g. 'The trees waved at me.'

Alliteration - a series of words that begin with the same consonant, e.g. 'The dirty dog danced in the mud.'

Rhetorical question - a question that doesn't need an answer, e.g. 'What do you think you're doing?'

Repetition - when you repeat a word or phrase to create an effect, e.g. 'It's not right, it's not fair, it's not okay.'

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Exaggeration - making something sound better or worse than it actually is, e.g. 'This is the best day ever.'

Triplet - three similar words or phrases in a row for effect, e.g. 'It is amazing, fantastic and wonderful.'

Year 7 – Intro to Geography & Map Skills

Geography is the study of the earth's landscapes, peoples, places and environments. It is, quite simply, about the world in which we live and how we are all connected through processes.

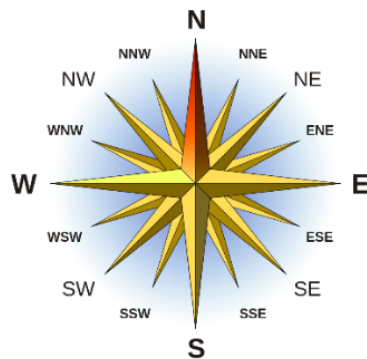
What should I already know?

- Name and locate the world's seven continents and five oceans.
- Name and locate the four countries of the United Kingdom, the four capital cities and counties.
- Understand geographical similarities and differences of urban and physical areas

Key Vocabulary and Definitions

Human	A study of the people, work, lifestyles and settlements.
Physical	A study of the natural features of the earth.
Environmental	A study of the ways the earth's environment is affected by humans.
Sustainable	Meeting our needs of the planet, without harming it for others in the future.

Compass Directions

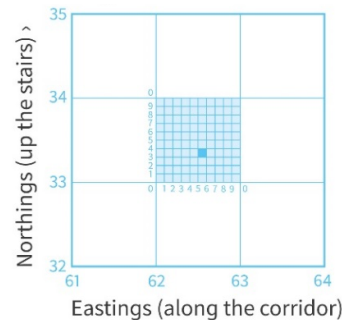


Important Map Skill Facts

Grid References

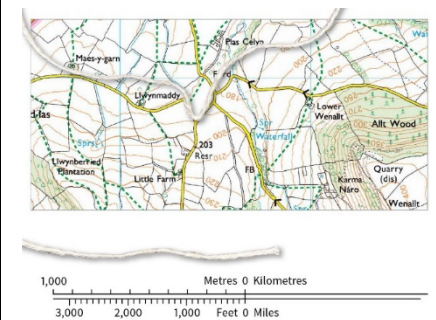
GRs help us find places on a map. Remember to always go along the corridor and then up the stairs.

EG: 4-figure GR for the blue square would be in 62 33 and the 6-figure is 625 333.



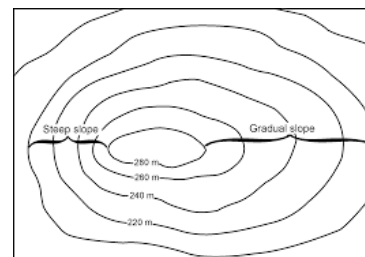
Scale

To work out distances we can use the scale bar. We can use paper, string or a ruler to measure distances. This helps us real distances. E.g. 4cm = 2km.

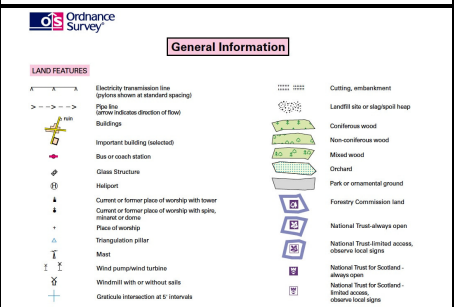


Contours

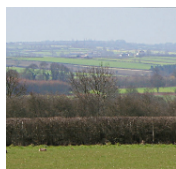
Contours show us the height of the land; how steep or flat land is. If the lines are closer together it is steep land, if they are further apart it is flatter.



Map Key
The key that you find on OS Maps is like a menu and tells us what each symbol represents – “a key unlocks the maps information.”



Urban =
City/Town



Rural =
Countryside

United Kingdom



Important Map Skill Facts

- Leicester is located in the East Midlands of the United Kingdom. The UK is part of the continent of Europe in the Northern Hemisphere.
- Continents can be measured in terms of land mass and the size of the population.

British Isles	United Kingdom	Great Britain
Is made up all the land mass in the map to the left: England, Scotland, Wales, Northern Ireland & Republic of Ireland.	Is made up of England, Scotland, Wales, Northern Ireland.	Is made up of England, Scotland and Wales.

Map of Europe



World Map – Continents and Oceans



The Living World: Tropical Rainforests Knowledge Organiser

Physical Characteristics of a Tropical Rainforest

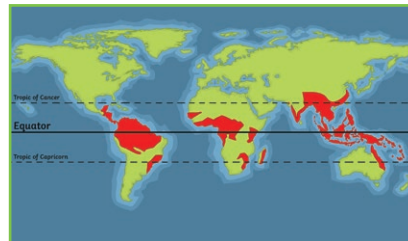
Climate	Water	Soils	Plants	Animals
<ul style="list-style-type: none"> hot (20-28°C) Sun is overhead all year round so there is no seasonal variation. wet (2000mm per year) Convectional rainfall every day. 	<ul style="list-style-type: none"> The roots of plants take up water from the ground. Rain is intercepted as it falls - much of it at the canopy level, this will evaporate as it heats up to form convectional rainfall. 	<ul style="list-style-type: none"> Rain washes away nutrients from soil. Soil is not very fertile. Humus layer of rotting leaf-fall is very thin (heat speeds up decomposition). 	<ul style="list-style-type: none"> Most trees are evergreen. Continual growing season. Five layers: forest floor, shrub layer, under-canopy, canopy (30m) and emergent. Epiphytes (plants that feed off other plants and take moisture from the air) e.g. ferns. Absorb CO₂ and release oxygen. 	<ul style="list-style-type: none"> Many species of animals live in the tropical rainforest. Food is plentiful and grows all year. Hundreds of different types of monkeys, snakes and birds. Thousands of insect species live in the tropical rainforest.

Issues Relating to Biodiversity

- Tropical rainforest ecosystems contain more species than any other ecosystem. Brazil's rainforests are thought to contain 59,851 species!
- Tropical rainforests cover less than 2 per cent of the planet, but contain an estimated 50 per cent of all life on earth's land masses.
- Habitat loss is the main cause of extinction. Deforestation (at a rate of about 300,000km² a year) has been caused by commercial logging, mineral extraction, commercial farming and subsistence farming.
- Many organisms have adapted and evolved to depend on a few species for survival. They may only be found in a very specific area. If something changes, that species will quickly become extinct e.g. golden poison frog.
- Sumatran orangutans exist only on the Indonesian island of Sumatra. Over the last 75 years, their population has diminished by 80 per cent due to human encroachment of their forest habitat, especially for timber and agriculture.

Global Distribution of Tropical Rainforests

- Most of the world's tropical rainforests lie between the Tropic of Cancer and the Tropic of Capricorn.
- Tropical rainforests are found on either side of the equator in South America, Central Africa, South East Asia and Northern Australia.
- The world's largest tropical rainforest (the Amazon) is found in South America.



The Interdependence of Climate, Water, Soils, Plants, Animals and People

Climate, water, soil, plants, animals and people are interdependent/have a symbiotic relationship in tropical rainforests (they depend on each other). For example:

- warm, wet climate → plants grow → decomposition of dead plant material → nutrients released → plants grow
- trees intercept water → water evaporates → clouds form → rainfall → plants grow

If climate, water, soils, plants, animals or people change, so will the tropical rainforest.

For example:

more people → more deforestation → more CO₂ → global warming → species extinction

Structure of a Tropical Rainforest

Emergent Layer (50m)

- tallest trees

Canopy (30m)

- engine of the rainforest
- captures most sunlight

Understorey (20m)

- younger trees

Shrub Layer (2-5m)

- ferns, bushes etc.

Forest Floor (0m)

- dark and quiet
- decomposition.
- sometimes flooded

How Plants and Animals Adapt to Tropical Rainforests

Plants adapt to cope with the high temperature, rainfall and competition for light.

Trees:

- grow tall in search of light. Most trees grow to 30m and form the canopy, where most photosynthesis takes place;
- have large buttress roots to support the trunk and to absorb nutrients from the thin leaf layer;
- have thin bark because they do not need to be kept warm;
- have smooth bark so water can run off easily;
- have thick, waxy leaves which repel water;
- have leaves with drip-tips so water can run off easily so leaves do not get too heavy.

Some plants on the **forest floor** hardly receive any sunlight and adapt to these conditions. The forest floor may flood for several months each year, so plants may adapt to survive this too.

Epiphytes or air plants (e.g. strangler fig) start to grow when a seed uses rotting plant debris in the nook of a tree for nutrients. It will send aerial roots down the trunk of the host tree which root in the ground and its branches will grow to catch the sunlight. The epiphytes' roots steal the host's nutrients. Eventually the host will die and as it decomposes will release more nutrients to feed the epiphyte.

Animals adapt to find food and escape predators.

- Many animals live in the canopy their entire lives as this is where most fruits and flowers are.
- Some have strong limbs for climbing and leaping e.g. howler monkeys.
- Some have suction-cups for climbing e.g. red-eyed frogs.
- Some have flaps of skin for gliding between branches e.g. flying squirrels.
- Some are camouflaged to hide from predators e.g. leaf toad.
- Many animals have adapted by learning to eat a food eaten by no other animal, e.g. toucans have a long, large bill to reach fruit on branches that are too small to support the bird's weight. The bill also is used to cut the fruit from the tree.
- Many animals are only active at night (nocturnal) when it is cooler e.g. sloths.
- Many can swim, allowing them to cross rivers or escape a flood e.g. jaguars.
- Some animals increase their sense of hearing, smell and even taste to help escape from predators in the dark of the forest floor e.g. carpet python.



Case Study: Amazon Rainforest

Deforestation has Economic and Environmental Impacts

Causes of Deforestation in the Amazon

- ranching
- logging
- small-scale farming
- Large-scale farming, e.g. Brazil is the world's second largest soya bean producer.
- Road building opens up the rainforest to further development.
- Dam building to produce HEP, e.g. Belo Monte dam complex is under construction and will be the world's fourth largest HEP dam complex.
- Mining, e.g. the Carajas complex in Brazil is the world's largest iron ore mine. It produces 109 million tonnes of iron ore a year.

Economic Impacts

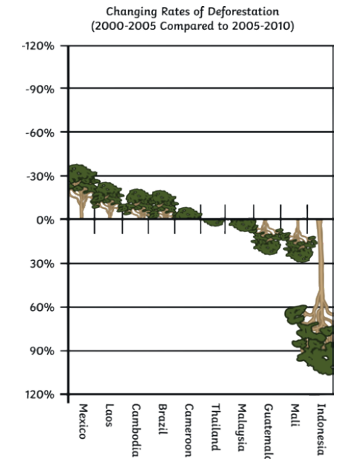
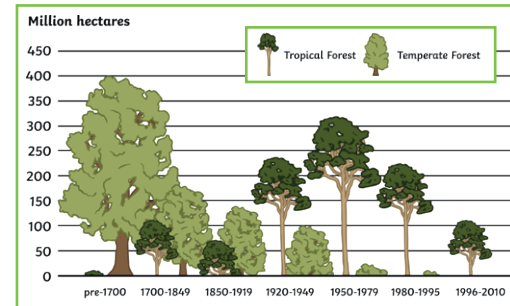
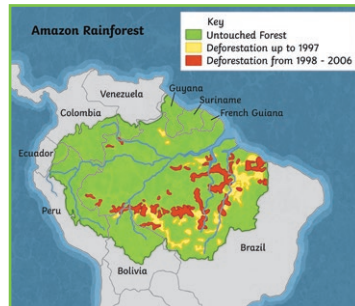
- Farming significantly contributes to the economy, e.g. ranching earns Brazil over \$6.9 billion a year.
- Logging contributes to the economy, however, it is estimated that 80 per cent of Brazilian hardwood is from illegal logging.
- Mining provides many jobs, e.g. the Carajas complex provides upto 3000 jobs.
- Indigenous people lose their traditional farming and hunting lands.

Environmental Impacts

- Deforestation of the Amazon could release 100 billion tonnes of carbon, resulting in increased atmospheric CO₂ and global warming.
- Deforestation means there are fewer trees to absorb CO₂ from the atmosphere, resulting in global warming.
- Mining releases dangerous toxins into the soil and rivers.
- 80 per cent of land animals live in tropical rainforest ecosystems, so deforestation will reduce earth's biodiversity.
- Removing tree cover will leave soil exposed to heavy rainfall causing soil erosion. Soya bean farming alone is responsible for the loss of 55 million tonnes of topsoil each year in Brazil.
- Deforestation could affect the water cycle, causing changes to weather patterns.

Changing Rates of Deforestation

Deforestation of tropical rainforests has been an issue for over 50 years and is still occurring. However, the overall rate of global deforestation in the tropical rainforests is slowing down (e.g. Brazil's rate of deforestation decreased by 21% in 2005-2010 compared to 2000-2005). Unfortunately, some countries still have an increasing rate of deforestation (e.g. Indonesia's rate of deforestation increased by 107% in 2005-2010 compared to 2000-2005).



Tropical Rainforests need to be Managed to be Sustainable

Sustainability – meeting the needs of today, without compromising the needs of tomorrow.

Education

Indigenous people can be made more aware of the impacts of deforestation and encouraged to alter their activities.

The international community can be educated about the impacts of deforestation. Greenpeace launched a campaign recently to increase public awareness of the impacts of palm oil production.

Afforestation (Replanting)

Logging companies must replant two or three trees for each tree felled.

Reducing Debt

In 2008, the governments of US and Peru struck a deal. Peru's national debt was reduced by \$25 million in return for their promise to conserve their rainforest.

Forest Reserves

Biodiversity and indigenous peoples' territories are protected against deforestation in areas designated as forest reserves by the government.

Company Policy

Companies can ban the sale of rainforest products that are not produced in a sustainable way. For example, in 2009 the Body Shop promised to ban the use of palm oil that was not produced in a sustainable way.

Companies can commit to Fairtrade farming which is more environmentally-friendly. For example, Tate and Lyle, the UK-based sugar company, converted its entire sugar range to Fairtrade by the end of 2009).

International Agreements

International agreements try to reduce illegal logging and encourage the trade of rainforest products from sustainably managed rainforests.

For example, the Forest Stewardship Council identify timber which has come from sustainably managed rainforests.

Selective Logging

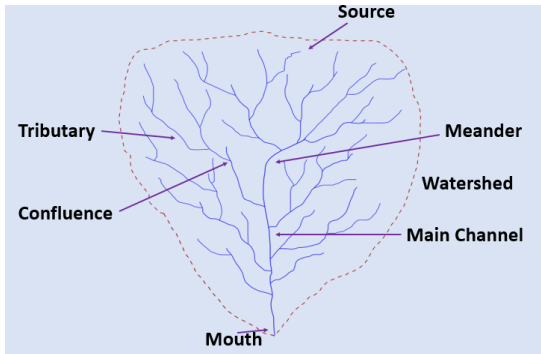
Logging companies should select and only cut down specific trees (e.g. mahogany) and leave the other trees standing.

Companies use 'horse-logging' or 'heli-logging'; dragging the felled trees out of the rainforest with horses or helicopters. This reduces the amount of damage caused.



Knowledge Organiser: Rivers

The Drainage Basin



Watershed: An area or ridge of land that separates waters flowing to different rivers

Source: Where the river begins

Confluence: Where two rivers or streams meet and join

Tributary: A smaller stream or river which joins with a bigger river, adding to the total volume of the river.

Meander: A winding part of a river

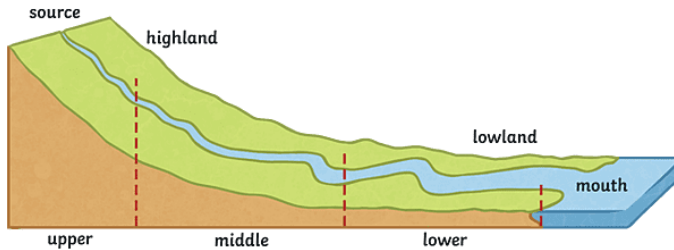
Mouth: The end of a river, where it joins the sea

River Processes

Erosion: Where rocks are worn away and the land is changed

Transportation: Where eroded material is carried downstream

Deposition: Where transported material is dropped when the river loses its energy, such as when it enters the sea



Types of Erosion

Hydraulic action - the sheer force of the moving water against the banks can cause air to be trapped in cracks and crevices. The pressure weakens the banks and gradually wears it away.

Abrasion - rocks carried along by the river scrape, scour and rub along the bed and banks and wear down the river like sandpaper.

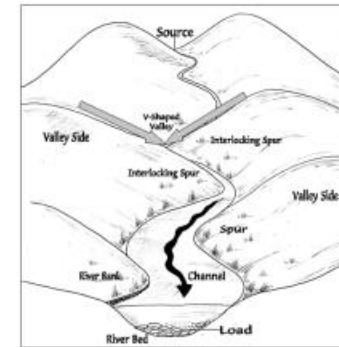
Attrition - rocks being carried by the river smash together and break into smaller, smoother and rounder particles.

Solution – minerals in the rocks are dissolved by weak acids in the river water. Particularly in rocks like chalk and limestone, soluble particles are dissolved into the river water.

The Upper Course of the River

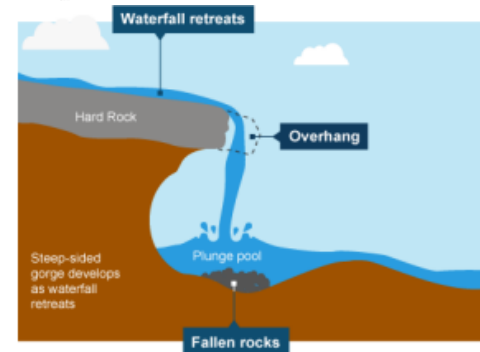
Features

Steep v-shaped valleys, interlocking spurs, rapids, waterfalls and gorges.



When a river is near its source, it often develops a v-shaped valley as the river erodes down (this is called vertical erosion). At the same time, weathering breaks up material on the valley slopes. Weathered material from the valleys gets deposited in the river.

1. The soft rock erodes more quickly, undercutting the hard rock
2. The hard rock is left overhanging and eventually collapses

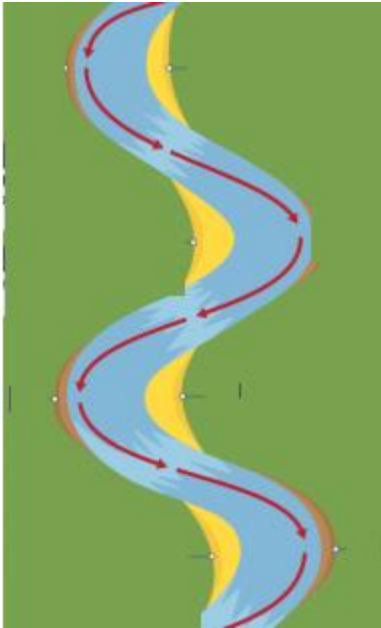


3. The fallen rock crashes into the plunge pool. They swirl around, causing more erosion.
4. Over time the process is repeated and the waterfall moves upstream
5. A steep-sided gorge is formed as the waterfall retreats

The Middle Course

Features

Wider, shallow valleys, meanders and oxbow lakes



1. The formation of meanders is due to both deposition and erosion. Meanders gradually move down stream.
2. The force of the water erodes and undercuts the river bank on the outside of the bend where the river flow has most energy
3. On the inside of the bend, where the river flow is slower, material is deposited, as there is more friction
4. Overtime, the horse shoe becomes tighter, until the ends become very close together. As the river breaks through the ends join, the loop is cut-off from the main channel
5. The cut-off loop is called an oxbow lake



Causes of Flooding

Human Causes

Deforestation: Rain is no longer intercepted (caught) by leaves, or soaked up by roots, so there are more floods

Urbanisation: More concrete means that soil cannot absorb the water, so no more water runs-off the surface into the river

Physical Causes

Impermeable Rock: Water can't travel through this rock, so water can't soak through

Hard, dry soil: Soil is made hard by dry weather. Water can't soak through it, so it runs over dry land instead

Very wet soil: If soil is saturated, no more rain can soak through

Steep slopes: Rain will run down quickly, before it has the chance to soak into the ground

Intensive Rainfall: Rain will fall quicker and heavier than soil and rocks can absorb it

Case Study: Warrington 2018

"Warrington 10th most at risk of flooding in the country" - MILLIONS of pounds will be injected into improving the town's flood defences after Warrington was named in a list of areas most affected by flooding. A report published by the Government's environmental watchdog ranked the area 10th, with 6,500 properties at risk.

Effects

- 6500 houses at risk.
- Widespread flooding to the local area.
- Transport links disrupted.
- Business shut, causing unemployment in the local area.

Responses

- £34million spent on Local Improvements.
- 5km flood wall.
- 2.2km embankment.
- Tree planting.
- Widened footpaths by the River Mersey.



How did Britain gain India?

At one point there were over 50 colonies in the British Empire. They were dotted all over the world and made the British Empire the largest the world had ever known. Its prize possession was India. People in Britain were most proud of it they called it the 'Jewel in the Crown'.



Indian Mutiny

The EIC banned traditional Indian ceremonies and wanted India to use the British education system. There were rumours that the new bullet cartridges were greased with animal fat that would be unclean for either Hindus (beef fat) or Muslims (pork fat).

Sepoys refused to use the new cartridges which they felt were unclean. The 85 sepoy were court-martialed and imprisoned. At the sentencing, the British humiliated the sepoy by stripping their uniforms and shackling their ankles in front of 4000 other sepoy. Shocked by the humiliation they had witnessed, the 4000 sepoy mutinied. They quickly overwhelmed the British and the imprisoned sepoy were released.

The sepoy then began to shoot everyone in sight. When the British troops eventually restored control, they executed thousands of sepoy and other Indians. After the chaos and carnage of the rebellion, the British government centralised control of the Indian Empire to Westminster and took away the East India Company's power. In 1877 Queen Victoria was named the Empress of India, solidifying India's position as part of the British Empire.

What was India like before the British

Raw Materials

India is rich in natural resources - iron ore, copper, gold, silver, gemstones, spices, tea and timber. This meant that any country that made strong trade links with India could potentially become very rich and powerful. Any country that managed to take control over India could become even more so.

Religion

Three of the world's major religions - Hinduism, Buddhism and Sikhism - originated in India. Other religions, such as Judaism, Christianity and Islam, have since arrived there too.

Knowledge

At various times throughout India's history, science, technology, engineering, art, literature, mathematics, astronomy and religion have flourished there.

Mughals

Ruling over all the Hindu princes was the Mughal emperor. The Mughal dynasty (1526-1858) was among the richest rulers in the world. The great Mughal emperor, Akbar, had managed to unite many of the India states. However, his grandson, was a fanatical Muslim and picked on followers of India's other religions. As wars broke out all over India, the Mughals eventually lost control of the country. It was exactly this time that European Powers became very interested in it.

The East India Company Rule

The EIC sent ships all over the world for many years. The ships left Britain full of cheap British goods and swapped them for goods in countries as far away as Japan, China and, of course India. Then they brought the fine china, silk, coffee and spices back to Britain to sell. The businessmen in charge of the company, and the kings and queens to whom they paid taxes, all made a fortune from this trade.

The EIC first set up trading posts in Surat, Madras and Bombay. The East India Company forced Bengal's 20 million people to pay 50% of their income in tax. Those who could not pay had their land taken away.

In the 1700s, the company began to take more Indian land. It had its own army and navy and used them against the rulers of India. At the Battle of Plassey in 1757, for example, around 3000 EIC soldiers (2200 of whom were locals) led by Robert Clive (known as Clive of India) defeated an Indian army of over 40,000 led by Prince Siraj ud-Daulah.

During the late 1700s, the EIC enlarged its army and made new conquests from the Indians and fought against other European nations too - and took over their trading posts. Over the following decades, various India rulers were either beaten in battle or played off against each other, so that more of India came under British rule. By the mid-1850s, most of India was controlled by the British.

How was WWI fought?

Propaganda

First the government started a huge propaganda campaign throughout the country. This meant it controlled all information about the war and sent out only the messages they wanted people to hear. So only news of victories was to be printed in newspapers, while defeats were hardly mentioned. British soldiers always looked like heroes, while any Germans were made to look like cruel savages. Most famously of all, they printed millions of posters aimed at making men join the army.

Pals Battalions

By 1916, 2.5 million men had agreed to fight. Some felt 'pushed' or pressured into joining up, while others felt the 'pull' of the excitement of war and serving their king and country.. The government also used 'pals battalions' as a method of getting men to fight. They thought that fighting alongside friends and neighbours rather than strangers would encourage people to join up - and they were right. Rival towns competed to prove they were more patriotic. Brothers, cousins, friends, and workmates enlisted together. There were football, bankers, railways and public-school boy battalions. Although they were a success there were tragic consequences. Of the 720 Accrington Pals who fought, 584 were killed, wounded or missing during one attack. Leeds Pals lost 750 out of 900 and both Grimsby and Sheffield Pals lost half their men. This robbed entire communities of many young men.

Conscientious Objectors

By the end of 1916, the flood of volunteers had slowed down. The solution they produced was conscription. This meant that any man between 18 and 41 could be forced to join the army and an extra 2.5 million people were called up - but not without problems. Some men believed war was wrong under the circumstances and refused to join up - they became known as conscientious objectors. There were around 16,000 conscientious objectors or 'conchies'. Most refused to fight because of political or religious beliefs - but joined in the war effort by working in the factories or mines or carrying stretchers on the battlefield. Around 1500 people refused to have anything at all to do with the war and were sent to prison. Conditions were made very hard for them and 69 of them died in prison.

Trenches

The Great War was fought mainly in Europe. The areas where the armies fought each other were called 'fronts'. The longest was the Western Front where French, Belgium and British soldiers tried to stop the Germans advancing to the coastline of northern France. As enemy soldiers faced each other they dug holes in the ground to protect themselves. These soon turned into deep trenches as they dug deeper. Soon, long lines of trenches stretched for over 640 km between the English Channel and Switzerland. Despite the loss of millions of men, the Western Front didn't move more than a few miles either way in over four years of war! This was stalemate - a complete inability to move forward and a determination not to be pushed back.

Tank	Flame Thrower	Artillery	Fighter and bomber planes
Rifle	Poison Gas	Machine Gun	Grenade

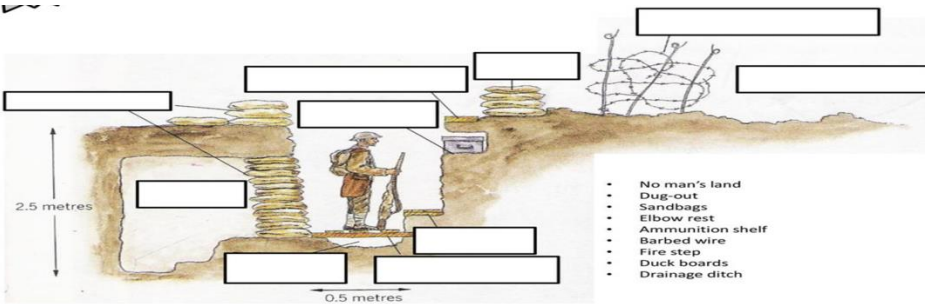
Shell Shock

The sheer horror of trench warfare was too much for some soldiers to cope with. The constant danger of death, the relentless noise of shelling and witnessing close friends being killed in terrible ways all took their toll on the men at the front line. More and more men were diagnosed with a condition called shell shock.

Some shook uncontrollably, others became paralysed with despite suffering no physical injury. Many had panic attacks, cried constantly or were unable to speak.

The Somme

One of the most famous battles of the Great War was the Battle of the Somme. During this four-and-a-half-month battle, the British lost 400,000 soldiers, the French lost 200,000 and the Germans lost around 450,000. The British and French view it as a victory (they gained 15km of land)...but at a massive cost. Historians have since debated who was to blame for the high number of British deaths. One popular interpretation is that the generals have been called '**donkeys**'. In fact, a common phrase to describe the British Army at this time is '**lions led by donkeys**' (lions being the brave soldiers). General Sir Douglas Haig, who was in charge of the army from 1915 - 1918, has been called a '**butcher**' for allowing so many men to die.



What happened in 1066?

Harold Godwinson



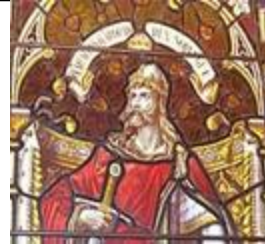
Harold Godwinson, the Earl of Wessex, was the richest and most powerful man in England.

His sister had been married to Edward the Confessor. He was a great fighter.

However he had been banished from England for a short time after an argument with Edward.

He claimed the throne as he said Edward the Confessor had promised it to him on his deathbed. The Witan (Anglo-Saxon nobles), supported his claim.

Harald Hardrada



Harald Hardrada was a Viking King from Norway.

He claimed the throne because he thought he had a right to it as his ancestors had been Kings of England.

He was the greatest fighter in Europe and his name translated as Hard ruler.

His claim was supported by Tostig, the brother of Harold Godwinson.

William of Normandy



William, Duke of Normandy was a powerful ruler of Normandy in France.

He had a close relationship with Edward the Confessor, and it was said that Edward loved him like a son. William even sent troops to England to support Edward. As thanks, Edward had promised him the throne and it was said that Harold Godwinson had done the same.

He was also tough, having skinned 30 people alive for making fun of his mother.

Battle of Fulford

The Vikings' boats landed in York, with 6,000 soldiers they overwhelmed the Northern English Earls. Hardrada had the support of Harold Godwinson's brother Tostig. The Battle was a disaster for the English Earls and Harold Godwinson. Harald Hardrada's army defeated the English, killing 1,000 soldiers and capturing the city of York. They then camped 15 miles away at Stamford Bridge.

Battle of Stamford Bridge

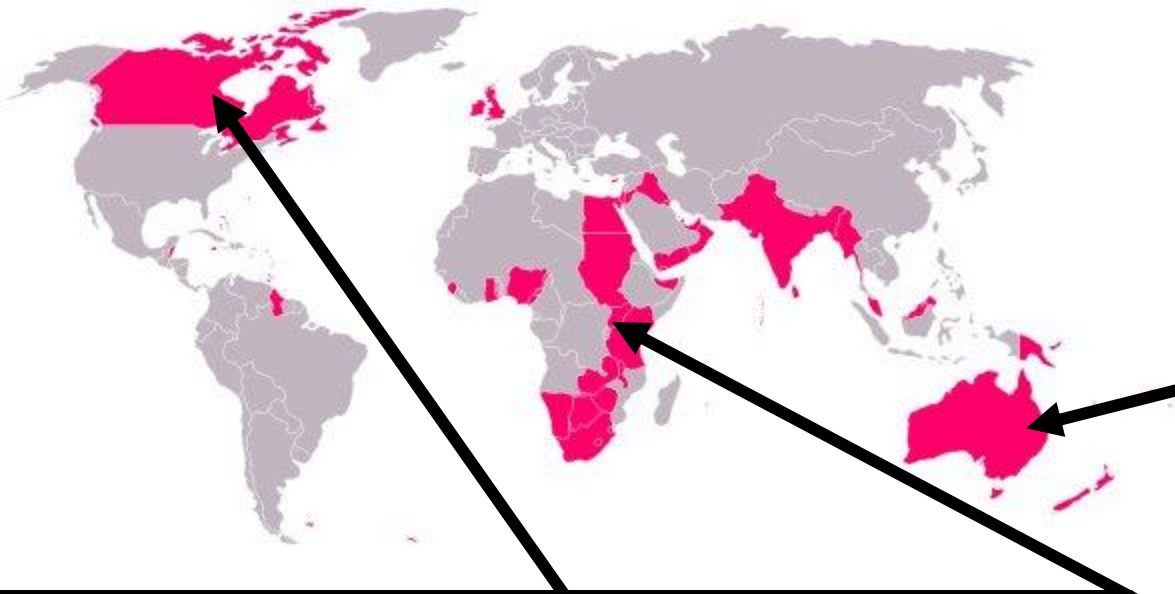
Within two days of the Battle of Fulford, Harold Godwinson created an army of 15,000 men. He marched his army up North, covering 185 miles in four days. They took the Viking army by surprise and defeated them, killing Harald Hardrada and Tostig Godwinson. Harold Godwinson's army was victorious but the long march and days of fighting left them exhausted.

Reasons for William's victory at the Battle of Hastings

- The wind changed in Normandy at the perfect time for William to set sail
- William rode over to the retreating soldiers and encouraged them to keep fighting
- William convinced his men that God was on their side
- During the battle Harold was on foot not on horseback so he could not move around easily to control his men
- Harold marched straight to Hastings when he could have waited in London to build up his army
- When William landed, Harold had just been fighting a battle in the north of England
- Some English soldiers chased some of William's Normans when they seemed to be retreating
- William's army was divided into different sections so he could attack in different ways
- The Normans had very skilled cavalry

What was the British Empire?

An empire is a collection of areas of land or countries that are ruled over and controlled by one country. The places controlled are usually called colonies. Around 100 years ago, Britain ruled the largest empire the world had ever known. Britain ruled over 450 million people living in 56 areas (or colonies) around the world.



The reasons the British wanted an Empire can best be categorised in three ways - God (religion), Gold (economic), Glory (British power).

Australia

In August 1768, James Cook, went on voyage that would change world history. He sailed up the east coast of Australia.

Cook and his crew eventually found a bay where they could anchor. When they tried to go ashore and explore, two men, armed with spears, tried to stop them. The men were Aboriginal Australians. Their ancestors had lived in Australia for thousands of years.

Here, he claimed the whole of the eastern coast of Australia as British territory. He called it 'New South Wales'. It did not seem to matter that the land was already inhabited. Cook's claim was the first step in the British colonisation of Australia. But it would be another 18 years before the British returned.

When they returned it was to use Australia as a huge prison called a convict colony. Years later it began to be settled and became the country of Australia.

North America

Before Europeans settled on the continent it was inhabited by 100s of different tribes.

Nearly 150 years later people from France, Britain and Spain had all gained land in what would become the USA.

Both the French and British were well armed, and built forts to guard their land.

For seven years, between 1756 and 1763, Britain and France were at war over who should control North America. Britain won.

That is how Canada and the West Indies became part of the British Empire

Africa

Until the 1880s, Britain was not really interested in Africa for the Empire.

However in the late 1870s several European nations started to 'claim' land in Africa.

The French and Belgians began to 'colonize' much of west Africa, whilst the Germans and the British were interested in the east and south. Portugal, Italy and Spain also moved in!

To prevent war, they even held a conference in 1884 to decide which nation could take what. Little attempt was made to understand the wishes or needs of the Africans themselves.

This race to grab as much of Africa as each nation could became known as the 'scramble for Africa'.

Britain took over 16 huge areas of land in Africa during the 'scramble', including Sudan, Nigeria, Kenya and Egypt. In fact, Britain's land ran in an almost unbroken line from Egypt in the north to South Africa in the South.

What caused World War One?

Wars usually have several causes that build up over time. Some causes go back a very long time, perhaps years or decades. But some causes may have happened only recently, in the last few days. These are sometimes called long term and short-term causes.



Some historians have compared Europe in 1914 to a barrel of gunpowder in that it only needed a spark to make the whole thing explode. On 28th June 1914 the spark arrived when the heir to the kingdom of Austria-Hungary - Archduke Franz Ferdinand - arrived in the Bosnian capital of Sarajevo and was assassinated.

- Militarism - Building up of armed forces and preparing to use them
- Alliances - Union between countries
- Imperialism - Power through building an empire
- Nationalism - Belief in your country's superiority over others

28th June - Austria-Hungary blames Serbia for killing the Archduke and attacks Serbia

29th July - Russia, which has promised to protect Serbia, gets its army ready to attack Austria-Hungary

1st August - Germany, which supports Austria-Hungary, hears about Russian preparation for war. Germany declares war on Russia.

3rd August - Germany is worried about France so declares war on the French, hoping to defeat them quickly before marching towards Russia

4th August - Germany asks Belgium if they can march through to attack France. Belgium says 'no'. Germany invades. Britain, which has a deal to protect Belgium from attack, declares war on Germany

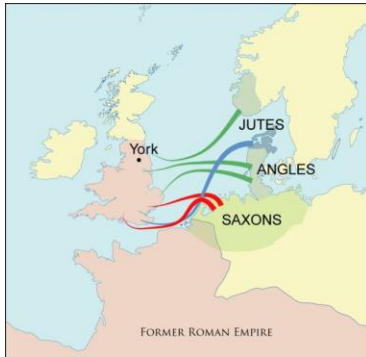
6th August - Austria-Hungary declares war on Russia

12th August - France and Britain declare war on Austria-Hungary

Who Invaded England before 1066?

Anglo-Saxons

Around 450, invaders came by boat from Denmark and northern Germany and were called Angles, Saxons, and Jutes. They soon became known as the Anglo-Saxons, and after fighting with the British tribes, began to settle and live here.



The Saxons changed England a lot. For example they:

Created many of our towns - if it ends in 'ton', 'wich', 'burn', 'hurst' or 'ham', then they are probably Anglo Saxon

Grew rye, wheat, oats and vegetables

Named many of our counties such as East Anglia

Gave us lots of words such as bed, cat, dog, tree, lick, jump, hunt, fox and fart

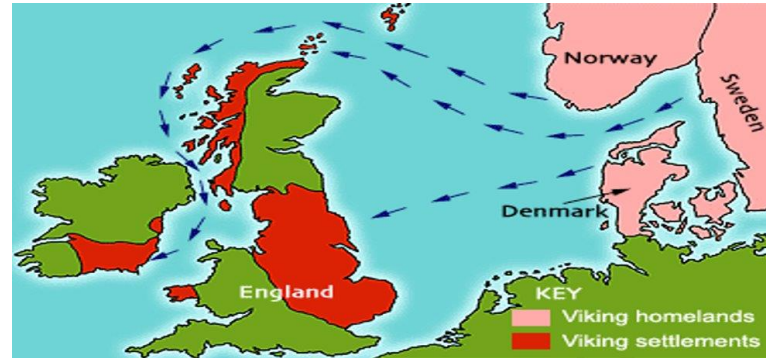
Gave England its name 'Angle-land' means land of the Angles, later England

Before converting to Christianity Anglo Saxons worshipped many gods. And some can be seen in our days of the week - Tiw (god of combat) = Tuesday, Woden (god of war) = Wednesday

Drove many of the British tribes into Wales, Cornwall, Cumbria, and Scotland.

Vikings

In the late eighth century the Anglo-Saxons faced invasion from across the North Sea from Denmark, Norway and Sweden by Vikings.



Impact on Conquered People

- Goods from all the different areas where Vikings traded, raided or explored were spread more quickly
- England's small kingdoms become more united
- Valuables were stolen; people were killed and taken into slavery
- Today, places ending in 'by' and 'thorpe' were probably named by the Vikings. 'By' means settlement and 'thorpe' means smaller village.

Impact on Vikings

- A wide range of goods from both Europe and the Middle East became available to improve the lifestyle and development of the technological skills of the Vikings.
- Vikings converted to Christianity
- An enormous amount of treasure was taken to Scandinavia
- In 965 King Harald Bluetooth demanded his that his people become Christian.

Normans

The Normans originated from Normandy (France) in the year 911. Over the next three centuries they carved out land across Europe and Asia.



Reason	Explanation
England was one of the richest countries in Europe	This encouraged William to invade because he could gain more money from taxation and make himself richer
William had been good friends with Edward, the previous king of England	As a result, William knew how England worked and had the support of some other powerful people in England
England was just across the sea from Normandy	As a result William could easily gather his army and sail quickly over the English Channel to attack
William believed he had been promised the throne of England	Therefore, William believed he had a right to be king of England, and also that God was on his side because the throne had been taken from him
William was the Duke of Normandy, he was not a king	This meant that England gave William an opportunity to be king, which was a more respected position than duke



Year 7

Autumn Term - Term 1

Knowledge Organiser

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Year 7 Knowledge Organiser DATA

What do I need to be able to do?

- Understand how to represent the number 5 in a tally.
- Calculate the mode, median, range and mean of a list of data.
- Complete and read information from a pictogram.
- Draw and read a bar chart.

Key Words

Mean: Add all of the numbers together and divide by how many there were.

Range: The biggest number subtract the smallest number.

Mode: The value there the most times.

Median: The middle number when they are in order.

Frequency: The number which tells us how many pieces of data there are.

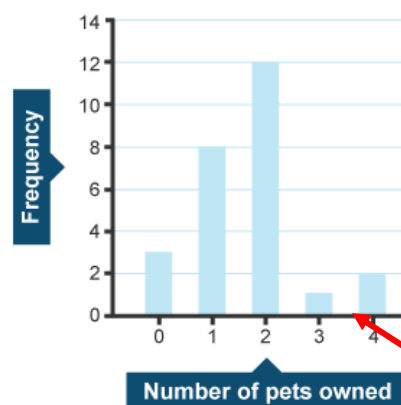
Tally Charts

Tally marks are used to help count things. Each vertical line represents one unit. The fifth tally mark goes down across the first four to make it easier to count. The frequency column is completed after all the data has been collected.

You must represent 5 like this.

Eye Colour	Tally	Frequency
brown		6
blue		8
green		3
grey		4
hazel		5

Bar Charts



A bar chart has a horizontal axis and a vertical axis. The x axis is for the type of data and the y axis shows the frequency. The bars show the data value of each category. There must be a gap between each bar and the scale must increase in the same sized intervals and the axes must be labelled.

You must include gaps and labels.

Year 7 Knowledge Organiser DATA

Pictograms

Pictograms are similar to bar charts, but the data is shown in pictures. A pictogram must have a key so that you know what a full image represents.

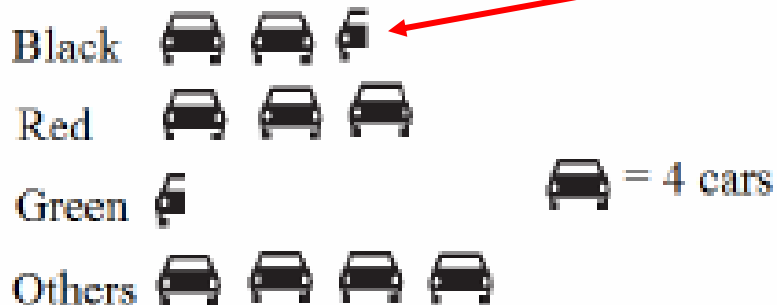
Looking at this diagram:

Black = $4 + 4 + 2 = 10$ cars

Red = $4 + 4 + 4 = 12$ cars

Green = 2 cars

Others = $4 + 4 + 4 + 4 = 16$ cars



Interpreting data

Information can be shown in tables, charts or graphs.

Interpreting data simply means understanding or working out what is being shown by a table, graph or chart and being able to answer questions about that information.

Average and Range

Here is a list of numbers: 12, 15, 10, 8, 15

Mean: The mean is the average of a set of data.

Add all of the values together $12 + 15 + 10 + 8 + 15 = 60$

Divide this by the number of values in your list $60 \div 5 = 12$

The mean of this data is 12.

Mode: This is the value that appears the most times in the list. So if we look at the list above then the mode would be 15 because 15 appears twice in the list.

Range: This is the difference between the biggest and smallest numbers in the list.

$15 - 8 = 7$ so the range for the list above is 7.

Median: This is the middle number but only when the list is in order from smallest to biggest.

8 10 12 15 15

This is in the middle so it must be the median.

12 is in the middle of the list so the median must be 12.

Year 7 Knowledge Organiser NUMBER SKILLS

What do I need to be able to do?

- Add and subtract numbers using the column method.
- Multiply numbers using a suitable written method.
- Divide numbers using the bus stop method.
- Calculate with directed numbers.
- Round values to a suitable degree of accuracy.

Key Words

Add: Finding the total of 2 or more number.

Subtract: Finding the difference between 2 numbers.

Multiply: Increasing a value by a given times table.

Divide: Share a given number using a specific times table.

Directed numbers: Positive and negative numbers.

Round: Changing the given number to a value that it is close to.

Column addition and subtraction

	4	5	8	6	4
+	2	3	4	9	7
	6	9	3	6	1
		1	1	1	

Addition: Starting with the ones, add each column in turn. Regroup tens, hundreds etc as required.

	3	5	⁶ 7	¹³ 4	¹ 2
-		3	4	7	6
	3	2	2	6	6

You must remember to borrow if you can't subtract with the numbers you have.

Subtraction: Starting with the ones, subtract each column in turn. Exchange tens, hundreds etc as required.

1	2	2	
	1	5	4
×		2	6
	9	2	4
3	0	8	0
4	0	0	4
1	1		

Multiplication: Starting with the ones multiply separately each value in the top row. When moving to the tens, hundreds etc remember to add in the correct number of zeros to reflect its value. When you have finished multiplying add your totals together.

Remember to add in one zero when moving to the tens column to reflect its value.

Year 7 Knowledge Organiser NUMBER SKILLS

Division

Division: Set up your question as shown. Starting from the left divide the number under the bus stop by the number on the outside. Any remainders must be carried to the next value along. Continue this process until you have got to the end of the number you are dividing.

You must carry any remainders here.

Start from the left.

			4	4	0	5	$5 \div 12 = 0 \text{ r}5$
12	5	2	8	6	0		$52 \div 12 = 4 \text{ r}4$
							$48 \div 12 = 4$
							$6 \div 12 = 0 \text{ r}6$

Rounding

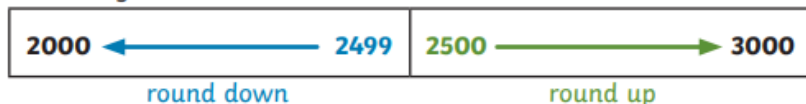
To make a number simpler but keep its value close to what it was.

If the digit to the right of the rounding digit is less than 5, round down. If the digit to the right of the rounding digit is 5 or more, round up.

For example, 74 round to the nearest ten is 70, because 74 is closer to 70 than 80.

Always read what you are asked to round to carefully.

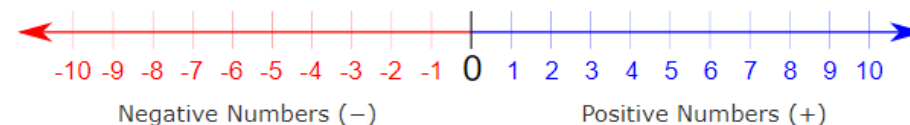
Rounding to the nearest 1000



Directed numbers

Directed numbers: This refers to both positive and negative numbers/integers.

- is used in front of an integer if it is negative
- + is sometimes used in front of an integer if it is positive but not always



To calculate with negative numbers we must follow the following rules:

Rule		Example
$+(+)$	Two like signs become a positive sign	$3+(+2) = 3 + 2 = 5$
$-(-)$		$6-(-3) = 6 + 3 = 9$
$+(-)$	Two unlike signs become a negative sign	$7+(-2) = 7 - 2 = 5$
$-(+)$		$8-(+2) = 8 - 2 = 6$

There won't always be brackets in the question but it doesn't change the meaning.

Positive integers won't always have + in front of them.

Year 7 Knowledge Organiser EXPRESSIONS & FORMULAE

What do I need to be able to do?

- Simplify expressions by collecting like terms.
- Write an expression from a given sentence.
- Expand a single bracket.
- Substitute into an expression or formula.

Key Words

Formula: A rule written using symbols that describe a relationship between different quantities.

Expression: Shows a mathematical relationship whereby there is no solution.

Equation: A mathematical statement that shows that two expressions are equal.

Term: This is a number and a letter put together, for example $3x$ is a term.

Expanding brackets

Each term inside the bracket is multiplied by this value.

$$\begin{aligned} & 2(3a - 4) \\ &= 6a - 8 \\ &= 6a - 8 \end{aligned}$$

Expanding: To expand a bracket you multiply each term on the inside of the bracket by the term on the outside of the bracket. It is very important that you multiply all of the terms.

Simplifying expressions

The operation symbol in front of the term tells you what to do.

Simplify:

$$\begin{aligned} & 4a + 3b - a + 2b \\ &= 3a + 5b \end{aligned}$$

Collecting like terms: You can only collect terms with the same letter together. The 'a' terms can only be collected with other 'a' terms. The operation symbol in front of the terms tells you what to do with it.

Expand and simplify:

$$\begin{aligned} & 2(4a + 2b) - 2(a + 3b) \\ &= 8a + 4b - 2a - 6b \\ &= 6a - 2b \end{aligned}$$

Expanding and collecting like terms: You need to first expand the brackets separately and then collect the terms with the same letter like you would in the previous question.



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Year 7 Knowledge Organiser EXPRESSIONS & FORMULAE

Expressions

Expression: An expression is a group of numbers, letters and operation symbols. It is important that you read the words carefully and work out their meaning before deciding on the most suitable operation. It never has an equals sign.

More than = add
Less than = subtract
Always check the wording carefully.

Add 14 to a $a + 14$
Subtract 20 from b $b - 20$
Multiply c by 4 $4c$
12 more than d $d + 12$
Multiply e by 3 and subtract 5 $3e - 5$
Add 12 to f and then multiply by 2 $2(f + 12)$

Formulae

Formulae: The word formula has two possible plural forms, formulae and formulas.

A formula is a special type of equation that shows the relationship between different variables. Formulae are often used in geometry topics to find area and volume.

Values would be substituted into the formula in the correct place.

Area of rectangle =
length \times width

Area of triangle =
(base \times height) \div 2

(12.5 \times hours worked)
+ 25 = cost of job

Equations

Equation: An equation is a number statement with an equals sign. Expressions on either side of the equals sign are of equal value. There is always a solution or answer to an equation.

To solve the equation you would then do the inverse of the calculation you can see. Inverse means the opposite.

$$\begin{aligned}d + 12 &= 30 \\d &= 30 - 12 \\d &= 18\end{aligned}$$

$$\begin{aligned}a + 14 &= 20 \\b - 20 &= 15 \\4c &= 28 \\d + 12 &= 30 \\3e - 5 &= 10 \\2(f + 12) &= 44\end{aligned}$$

Substitution

Substitution: This is where we replace the letter we see for the number that it is worth.

For example: If $w = 6$ and $y = 5$

Remember that $3y$ means 3 multiplied by the value of y .

a) $w + 5 = 6 + 5 = 11$

b) $3y - 2 = 3 \times 5 - 2 = 15 - 2 = 13$

c) $8w + 2y = 8 \times 6 + 2 \times 5 = 48 + 10 = 58$

Year 7 Knowledge Organiser DECIMALS

What do I need to be able to do?

- Add and subtract decimals using the column method.
- Multiply decimals by whole numbers and decimals by decimals using a written method.
- Divide decimals using the bus stop method.
- Use rounding to estimate values to calculations.
- Order decimals from smallest to biggest.

Key Words

Add: Finding the total of 2 or more number.

Subtract: Finding the difference between 2 numbers.

Multiply: Increasing a value by a given times table.

Divide: Share a given number using a specific times table.

Decimal: A number that has digits that are smaller than one whole. It has a decimal point.

Round: Changing the given number to a value that it is close to.

Column addition and subtraction

$$\begin{array}{r} 5.649 \\ + 39.27 \\ \hline 44.919 \end{array}$$

$$\begin{array}{r} 3.47 \\ - 1.59 \\ \hline 1.88 \end{array}$$

Addition: Starting with the digit on the right, add each column in turn. Regroup tenths, tens, hundreds etc as required.

You must remember to borrow if you can't subtract with the numbers you have.

Subtraction: Starting with the digit on the right, subtract each column in turn. Exchange tenths, tens, hundreds etc as required.

Column multiplication

Question: 1.54×2.6

Now 154×26

1	5	4	
	1	5	4
×		2	6
	9	2	4
3	0	8	0
4	0	0	4
1	1		

We multiplied by 1000 to get rid of the decimal points because there are 3 numbers in total after the point in the question.

Multiply the whole numbers.

Divide your answer by 1000.

Answer = 4.004

Multiplication: Remove any decimal points from your values before multiplying. Then multiply as you would normally. When you have finished multiplying and have added to get your total remember to then divide by the multiple of 10 that you multiplied by to remove the decimal point at the beginning.

Year 7 Knowledge Organiser DECIMALS

Division

Division: Set up your question as shown. Starting from the left divide the number under the bus stop by the number on the outside. Any remainders must be carried to the next value along. Continue this process until you have got to the end of the number you are dividing.

8.12 ÷ 4			
	2	.	0
4	8	.	12

You must carry any remainders here.

Rounding decimals

To make a number simpler but keep its value close to what it was.

If the digit to the right of the rounding digit is less than 5, round down. If the digit to the right of the rounding digit is 5 or more, round up.

For example:

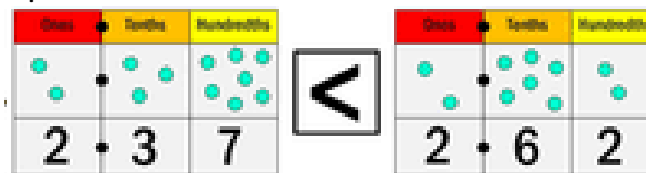
7.44 rounded to 1 decimal place is 7.4, because 7.44 is closer to 7.4 than 7.5.

0.38 rounded to 1 decimal place is 0.4 because 0.38 is closer to 0.4 than 0.3.

Always read what you are asked to round to carefully.

Comparing and ordering decimals

Comparing decimals: It is important when comparing decimals to compare each digit which is in the same place value. For example, compare the tenths with each other because they are in the same place.



Compare the tenths – 3 is less than 6 so we know that 2,37 must be smaller than 2.62.

Ordering decimals: When ordering decimals it is important to ensure that all of the decimals have the same number of digits.

For example:

0.3, 0.43, 0.03, 0.043 would become 0.300, 0.430, 0.030, 0.043

It is then easy to order them: 0.03, 0.043, 0.3, 0.43

You must only use the additional zeros to help you order the decimals, they must be written as they were in the question as your answer.



Year 8

Autumn Term - Term 1

Knowledge Organiser

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Year 8 Knowledge Organiser NUMBER SKILLS

What do I need to be able to do?

- Add and subtract numbers using the column method.
- Multiply numbers using a suitable written method.
- Divide numbers using the bus stop method.
- Calculate with directed numbers.
- Round values to a suitable degree of accuracy.

Key Words

Add: Finding the total of 2 or more number.

Subtract: Finding the difference between 2 numbers.

Multiply: Increasing a value by a given times table.

Divide: Share a given number using a specific times table.

Directed numbers: Positive and negative numbers.

Round: Changing the given number to a value that it is close to.

Column addition and subtraction

	4	5	8	6	4
+	2	3	4	9	7
	6	9	3	6	1
		1	1	1	

Addition: Starting with the ones, add each column in turn. Regroup tens, hundreds etc as required.

	3	5	⁶ 7	¹³ 4	¹ 2
-		3	4	7	6
	3	2	2	6	6

You must remember to borrow if you can't subtract with the numbers you have.

Subtraction: Starting with the ones, subtract each column in turn. Exchange tens, hundreds etc as required.

1	2	2	
	1	5	4
×		2	6
	9	2	4
3	0	8	0
4	0	0	4
1	1		

Multiplication: Starting with the ones multiply separately each value in the top row. When moving to the tens, hundreds etc remember to add in the correct number of zeros to reflect its value. When you have finished multiplying add your totals together.

Remember to add in one zero when moving to the tens column to reflect its value.



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Year 8 Knowledge Organiser NUMBER SKILLS

Division

Division: Set up your question as shown. Starting from the left divide the number under the bus stop by the number on the outside. Any remainders must be carried to the next value along. Continue this process until you have got to the end of the number you are dividing.

You must carry any remainders here.

Start from the left.

			4	4	0	5	
12	5	2	8	6	0		

$5 \div 12 = 0 \text{ r}5$
 $52 \div 12 = 4 \text{ r}4$
 $48 \div 12 = 4$
 $6 \div 12 = 0 \text{ r}6$

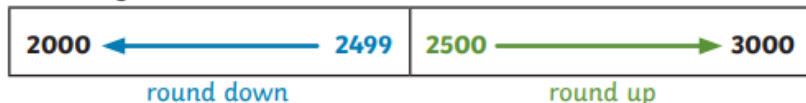
Rounding

To make a number simpler but keep its value close to what it was.

If the digit to the right of the rounding digit is less than 5, round down. If the digit to the right of the rounding digit is 5 or more, round up.

For example, 74 round to the nearest ten is 70, because 74 is closer to 70 than 80.

Rounding to the nearest 1000

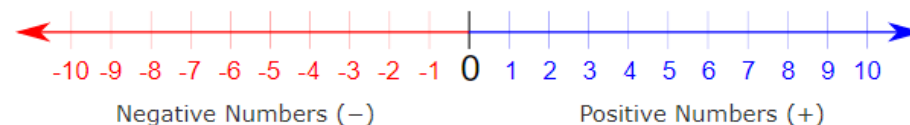


Always read what you are asked to round to carefully.

Directed numbers

Directed numbers: This refers to both positive and negative numbers/integers.

- is used in front of an integer if it is negative
- + is sometimes used in front of an integer if it is positive but not always



To calculate with negative numbers we must follow the following rules:

Rule		Example
$+(+)$	Two like signs become a positive sign	$3+(+2) = 3 + 2 = 5$ $6-(-3) = 6 + 3 = 9$
$-(-)$		
$+(-)$	Two unlike signs become a negative sign	$7+(-2) = 7 - 2 = 5$ $8-(+2) = 8 - 2 = 6$
$-(+)$		

There won't always be brackets in the question but it doesn't change the meaning.

Positive integers won't always have + in front of them.

Year 8 Knowledge Organiser NUMBER PROPERTIES

What do I need to be able to do?

- Recognise and calculate square numbers and roots.
- Recognise and calculate cube numbers and roots.
- Use BIDMAS to complete calculations.
- Identify factors and multiples.
- Identify a prime number and complete a prime factor tree.

Key Words

Square: A square number is the result of multiplying a number by itself.

Cube: A cube number is the result of multiplying a number by itself twice.

Root: A root is the reverse of a power.

Prime number: A prime is a number that has only two factors which are 1 and itself.

Multiple: A number in the given numbers times table.

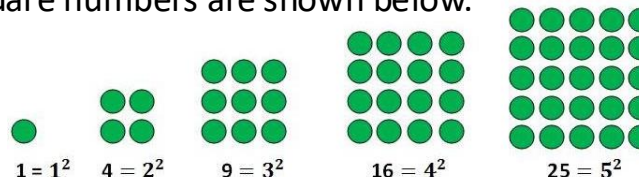
Factor: A number that fits into another number exactly.

Operation: In maths these are the functions $\times \div + -$.

Indices: These are the squares, cubes and powers.

Squares, cubes and roots

Square numbers: This is when we multiply a number by itself, the first 5 square numbers are shown below.



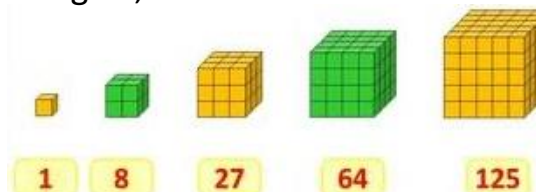
Square roots: This is the number that we started with to get the square numbers.

$$\sqrt{49} = 7 \text{ because } 7 \times 7 \text{ is } 49$$

$$\sqrt{100} = 10 \text{ because } 10 \times 10 \text{ is } 100$$

Remember the answer is 7 not 7x7.

Cube numbers: This is when we multiply a number by itself and then by itself again, the first 5 cube numbers are shown below.



Index form

Index number: An index number is a number which is raised to a power. The power, also known as the index, tells you how many times you have to multiply the number by itself.

2^5 is the index notation.

$$2^5 = 2 \times 2 \times 2 \times 2 \times 2 = 32$$

Year 8 Knowledge Organiser NUMBER PROPERTIES

Multiples and factors

Multiples: The result of multiplying a number by an integer. It is the times table of a number.

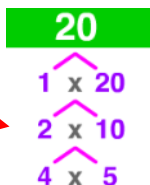
Multiples of 4: 4, 8, 12, 16, 20 ...

Multiples of 5: 5, 10, 15, 20, 25...

Multiples are the list of times tables.

Factors: A number that divides exactly into another number without a remainder. It is often helpful to write them in pairs.

Write them in pairs first so you don't miss any!



Factors of 20 = 1, 2, 4, 5, 10, 20

Prime numbers

Prime: This is a number that has exactly 2 factors; 1 and itself.

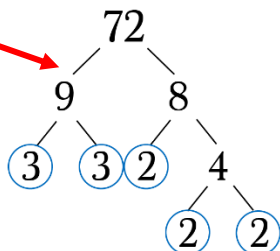
2 is the only even prime. The first 10 prime numbers are:

2, 3, 5, 7, 11, 13, 17, 19, 23, 29

These are not the only prime numbers.

Prime factorisation: This is when we split a number into its prime factors using a factor tree. We circle the prime factors.

We need to find pairs of numbers that multiply to give the number above.



If a number is repeated we write it as a power.

$$72 = 2^3 \times 3^2$$

BIDMAS – order of operations

B Brackets

I Indices

D Division

M Multiplication

A Addition

S Subtraction

If a calculation contains the circled calculations then you need to work from left to right.

$$5 \times 4 - 8 \div 2$$

$$20 - 4 = 16$$

This question can be split into two separate calculations which are then combined to get the answer.

We need to deal with the powers inside the brackets first by calculating 2^2 .

$$(2^2 + 6)^2 \times 4 - 8$$

$$(4 + 6)^2 \times 4 - 8$$

$$(10)^2 \times 4 - 8$$

Once the bracket has been fully calculated we then look at the operations on the outside of the bracket.

$$100 \times 4 - 8$$

$$400 - 8 = 392$$

Year 8 Knowledge Organiser PERIMETER & AREA

What do I need to be able to do?

- Calculate the perimeter of a shape.
- Calculate the area of a square, rectangle, triangle, parallelogram and trapezium.
- Calculate the surface area of a cube.
- Calculate the surface area of a cuboid.
- Calculate the area of a triangular prism.

Key Words

Perimeter: The total distance around the outside of a shape.

Area: The space inside a 2D shape.

Length: How long a shape is.

Width: How wide a shape is.

Height: How high a shape is.

Base: The bottom of a shape.

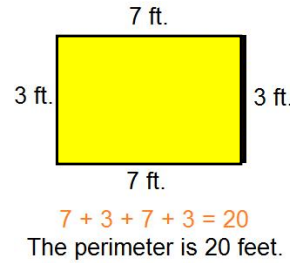
Face: The flat part of a 3D solid.

Edge: Where 2 faces meet.

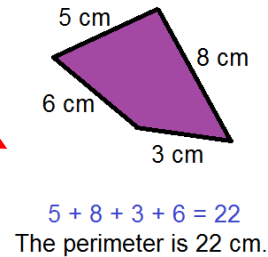
Parallel: Two lines that never meet.

Perimeter

Perimeter: This is the total distance around the outside of the shape.



We must remember to include all of the sides.

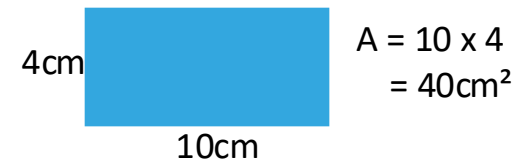
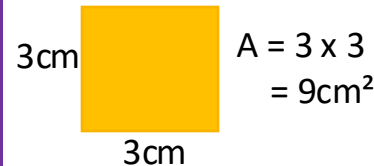


Area – Rectangles and parallelograms

Area: This is the space that a 2D shape takes up.

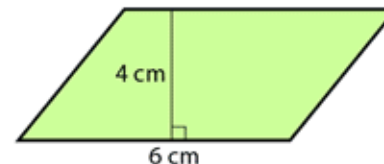
Squares and rectangles:

The formula is the same for both shapes: **A = Length x Width**



Parallelograms:

The formula is similar to a rectangle but instead of width we use the height. **A = Length x Height**



Sometimes the length is referred to as the base.

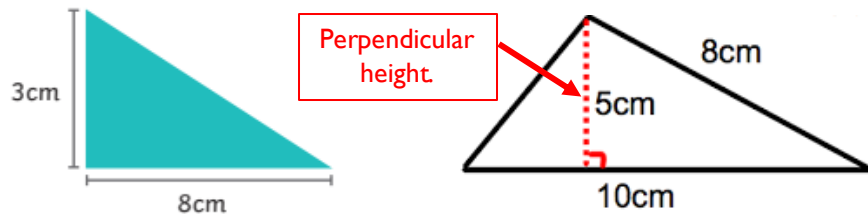
Year 8 Knowledge Organiser PERIMETER & AREA

Area - Triangles

To find the area of a triangle we use the following formula:

$$\text{Area} = \frac{\text{Base} \times \text{perpendicular height}}{2}$$

The formula is very similar to a rectangle but we must divide by 2 because a triangle is half the size of a rectangle.



$$\text{Area} = \frac{8 \times 3}{2} = 12\text{cm}^2$$

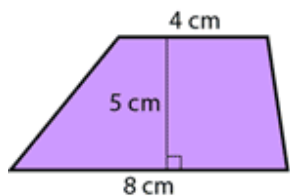
$$\text{Area} = \frac{10 \times 5}{2} = 25\text{cm}^2$$

Area - Trapeziums

To find the area of a trapezium we use the following formula:

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

Where a and b are the parallel sides and h is the height.



$$\text{Area} = 4 + 8 = 12$$

$$12 \div 2 = 6$$

$$6 \times 5 = 30\text{cm}^2$$

Add the parallel sides.

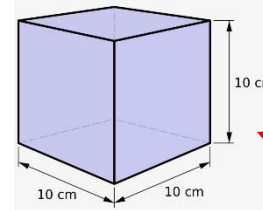
Divide the total by 2.

Multiply by the height.

Surface area

Surface area: This is the area of all of the faces of a 3D solid added together.

Cubes: Find the area of one of the faces and then multiply by 6. This is because all of the faces of a cube are the same size.

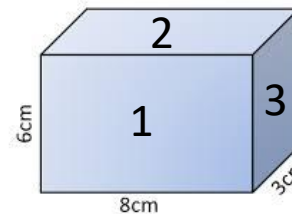


$$\text{Area of 1 face} = 10 \times 10 = 100\text{cm}^2$$

$$\text{Total surface area} = 100 \times 6 = 600\text{cm}^2$$

There are 6 faces with the same area.

Cuboids: They have 3 pairs of faces. We need to find the area of each of the faces we can see, add them together and then double.



$$\text{Face 1} = 8 \times 6 = 48\text{cm}^2$$

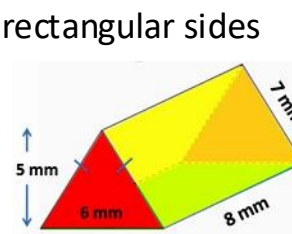
$$\text{Face 2} = 8 \times 3 = 24\text{cm}^2$$

$$\text{Face 3} = 3 \times 6 = 18\text{cm}^2$$

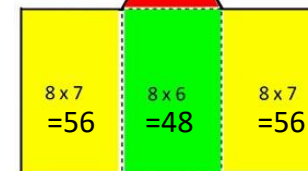
$$\text{Total} = 90\text{cm}^2$$

$$\text{Surface area} = 2 \times 90 = 180\text{cm}^2$$

Triangular prism: They have a pair of triangular sides and 3 rectangular sides



$$\frac{6 \times 5}{2} = 15$$



$$\begin{aligned} \text{Surface area} &= 15 + 15 + 56 + 56 + 48 \\ &= 190\text{mm}^2 \end{aligned}$$

Find the area of each face and then add together.

$$\frac{6 \times 5}{2} = 15$$

Year 8 Knowledge Organiser VOLUME

What do I need to be able to do?

- Identify the number of faces, edges and vertices of a 3D solid.
- Explain what volume means.
- Calculate the volume of a cube or cuboid.
- Calculate the volume of a triangular prism.
- Calculate the volume of a cylinder.

Key Words

Volume: The amount of space that an object occupies.

Capacity: The amount of space that a liquid occupies.

Cuboid: 3D shape with 6 square/rectangular faces.

Prism: A prism is a solid object with identical ends, flat faces and the same cross section all along its length.

Cross section: A cross section is the shape made by cutting straight across an object.










Vertices: Angular points of shapes.

Face: A surface of a 3D shape.

Edge: A line which connects two faces on a 3D shape.

3D solids

3D solids: They have 3 dimensions – length, width and depth. Here are the main 3D solids that you need to be familiar with.

Cube  6 square faces 12 edges 8 vertices	Tetrahedron  4 triangular faces 6 edges 4 vertices	Sphere  1 curved surface 0 edges 0 vertices
Cuboid  6 faces 12 edges 8 vertices	Octahedron  8 faces 12 edges 6 vertices	Triangular prism  5 faces 9 edges 6 vertices
Square-based pyramid  5 faces 8 edges 5 vertices	Cone  1 circular face 1 curved surface 1 curved edge 1 apex	Cylinder  2 circular faces 1 curved surface 2 curved edges 0 vertices

You especially need to know the names of these solids.

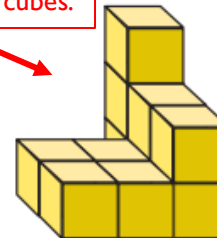
Volume – counting cubes

Volume: This is the amount of space that a 3D object occupies. Sometimes an object is made up of cubes, we can count them to calculate the volume.

This is made up of 11 cubes.

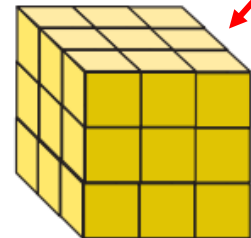


= 1cm³



11cm³

This is made up of 27 cubes.



27cm³

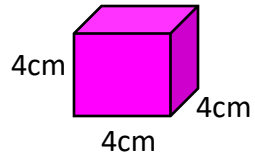
This is made up of 1 cube.

Year 8 Knowledge Organiser VOLUME

Cubes and cuboids

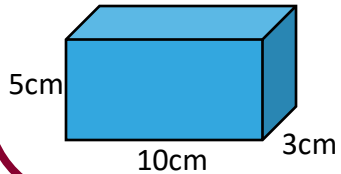
Cubes and cuboids: To calculate the volume of a cube and cuboid we use the following formula:

$$\text{Volume} = \text{Length} \times \text{Width} \times \text{Height}$$



$$\text{Volume} = 4 \times 4 \times 4 = 64\text{cm}^3$$

The units are cubic for volume.



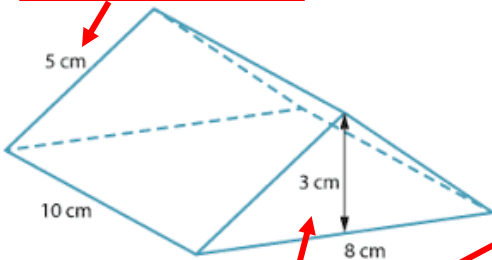
$$\text{Volume} = 10 \times 3 \times 5 = 150\text{cm}^3$$

It doesn't matter which order you multiply in.

Triangular prism

Prisms: To calculate the volume of a prism we calculate the area of the cross section (end face) and then multiply by the length.

We do not need this.



$$\text{Volume} = \text{Area of the cross section} \times \text{Length}$$

$$\text{Area of triangle} = \frac{3 \times 8}{2} = 12$$

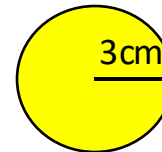
$$\text{Volume} = 12 \times 10 = 120\text{cm}^3$$

Area of the cross section.

Multiply the area of the cross section by 10 which is the length.

Cylinders

Cylinders: A cylinder is a prism so we use the same formula as for a triangular prism. The difference is that the cross section this time is a circle.



Reminder:

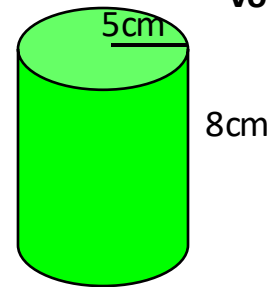
Area of a circle = πr^2 (r is the radius)

$$\text{Area} = \pi \times 3^2 = 9\pi = 28.3\text{cm}^2$$

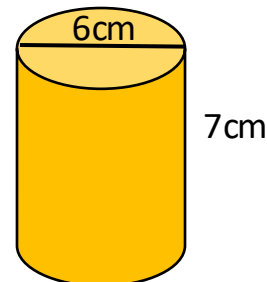
$$\text{Volume} = \text{Area of the cross section} \times \text{Length}$$

$$= \pi r^2 \times \text{Length}$$

Sometimes we leave our answer in terms of π .



$$\begin{aligned} \text{Volume} &= \pi \times 5^2 \times 8 \\ &= 200\pi \\ &= 628.3\text{cm}^3 \end{aligned}$$



We have the diameter so we must divide by 2 to get the radius.

$$\text{Radius} = 6 \div 2 = 3\text{cm}$$

$$\begin{aligned} \text{Volume} &= \pi \times 3^2 \times 7 \\ &= 63\pi \\ &= 197.9\text{cm}^3 \end{aligned}$$

Year 8 Knowledge Organiser DATA 1

What do I need to be able to do?

- Understand how to represent the number 5 in a tally.
- Calculate the mode, median, range and mean of a list of data.
- Complete and read information from a pictogram.
- Draw and read a bar chart.

Key Words

Mean: Add all of the numbers together and divide by how many there were.

Range: The biggest number subtract the smallest number.

Mode: The value there the most times.

Median: The middle number when they are in order.

Frequency: The number which tells us how many pieces of data there are.

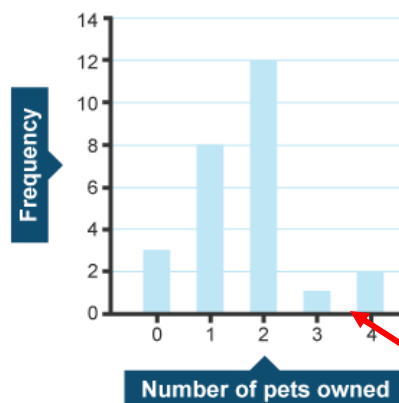
Tally Charts

Tally marks are used to help count things. Each vertical line represents one unit. The fifth tally mark goes down across the first four to make it easier to count. The frequency column is completed after all the data has been collected.

You must represent 5 like this.

Eye Colour	Tally	Frequency
brown		6
blue		8
green		3
grey		4
hazel		5

Bar Charts



A bar chart has a horizontal axis and a vertical axis. The x axis is for the type of data and the y axis shows the frequency. The bars show the data value of each category. There must be a gap between each bar and the scale must increase in the same sized intervals and the axes must be labelled.

You must include gaps and labels.

Year 8 Knowledge Organiser DATA 1

Pictograms

Pictograms are similar to bar charts, but the data is shown in pictures. A pictogram must have a key so that you know what a full image represents.

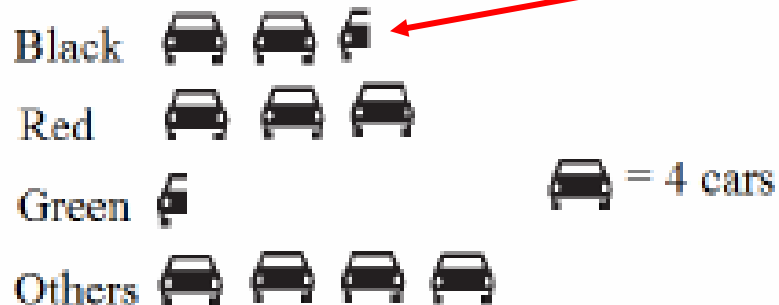
Looking at this diagram:

Black = $4 + 4 + 2 = 10$ cars

Red = $4 + 4 + 4 = 12$ cars

Green = 2 cars

Others = $4 + 4 + 4 + 4 = 16$ cars



Interpreting data

Information can be shown in tables, charts or graphs.

Interpreting data simply means understanding or working out what is being shown by a table, graph or chart and being able to answer questions about that information.

Average and Range

Here is a list of numbers: 12, 15, 10, 8, 15

Mean: The mean is the average of a set of data.

Add all of the values together $12 + 15 + 10 + 8 + 15 = 60$

Divide this by the number of values in your list $60 \div 5 = 12$

The mean of this data is 12.

Mode: This is the value that appears the most times in the list. So if we look at the list above then the mode would be 15 because 15 appears twice in the list.

Range: This is the difference between the biggest and smallest numbers in the list.

$15 - 8 = 7$ so the range for the list above is 7.

Median: This is the middle number but only when the list is in order from smallest to biggest.

8 10 12 15 15

This is in the middle so it must be the median.

12 is in the middle of the list so the median must be 12.

Year 8 Knowledge Organiser DATA 2

What do I need to be able to do?

- Read and draw a pie chart using a protractor.
- Draw a stem and leaf diagram.
- Draw a scatter graph.
- Identify outliers on a scatter graph.
- Draw a line of best fit on a scatter graph.
- Estimate values from a scatter graph.

Key Words

Frequency: The number which tells us how many pieces of data there are.

Protractor: This is a piece of equipment used to measure angles.

Scatter graph: This is a graph that shows the relationship between two variables.

Correlation: This describes if the data is increasing or decreasing.

Line of best fit: This is a line drawn on a scatter graph that follows the trend of the data.

Outlier: This is a data point that does not fit with the pattern of the rest of the data.

Pie charts

Pie charts represent discrete data. A circle is divided into segments, where each segment represents a data category. The size of each segment matches its proportion of the total amount.

Sport	Frequency	Angle
Swimming	12	$12 \times 15 = 180^\circ$
Netball	6	$6 \times 15 = 90^\circ$
Football	3	$3 \times 15 = 45^\circ$
Gymnastics	3	$3 \times 15 = 45^\circ$

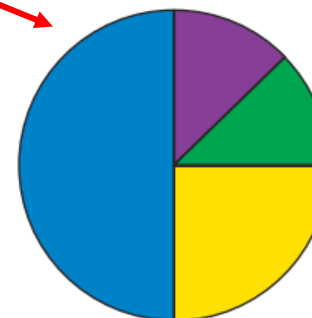
Total = 24

Each person: $360^\circ \div 24 = 15^\circ$

1. Find the total frequency.
2. Calculate one person by doing $360^\circ \div$ frequency.
3. Multiply each frequency by this value to get the angle size for each section.

You must use a protractor carefully to measure each section.

A pie chart to show children's favourite sports



Key

- swimming
- netball
- football
- gymnastics

You must label each section or use a key.

Year 8 Knowledge Organiser DATA 2

Stem and leaf diagrams

Stem and leaf diagram: This is a plot where each data value is split into a "leaf" (usually the last digit) and a "stem" (the other digits). The leaf part is only ever 1 digit, the stem can be several.

Here is a list of numbers and the stem and leaf diagram:

68, 75, 77, 79, 80, 82, 92, 96, 96, 97

Stem	Leaf
6	8
7	5 7 9
8	0 2
9	2 6 6 7

The 'leaves' must be from smallest to biggest in each row.

Key 6|8 = 68

You must include a key to explain what the stem and leaf shows.

Mode = 96 because 96 appears twice.

Median = 81 because 81 is in the middle of 80 and 82.

Range = $97 - 68 = 29$.

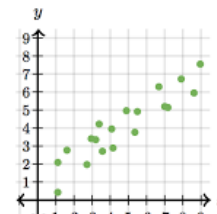
Mean = $\frac{68+75+77+79+80+82+92+96+96+97}{10} = 84.2$

We calculate these in the same way we would from a list.

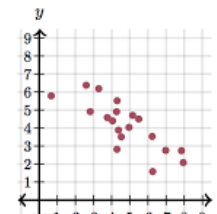
Scatter graphs

Scatter graph: This is a graph of plotted points that show the relationship between two sets of data.

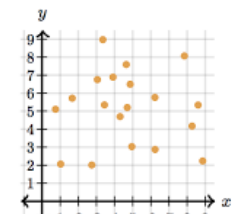
Types of correlation:



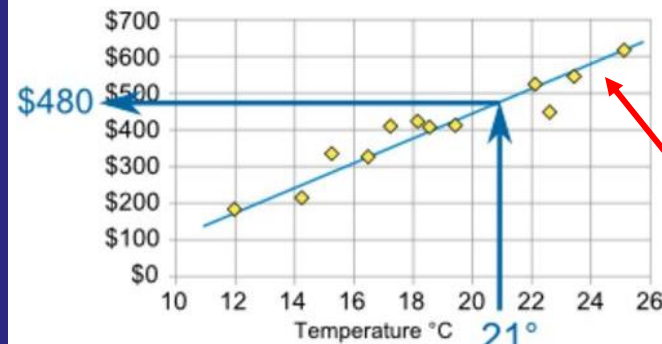
Positive



Negative



No correlation



The line of best fit needs to follow the trend of the data and have around half of the points either side. It does not need to start from 0.

Correlation: Positive correlation.

Description: As the temperature increases so does the amount of money made.

Estimate: $21^{\circ}\text{C} = \$480$.

Year 8 Knowledge Organiser EXPRESSIONS & EQUATIONS

What do I need to be able to do?

- Factorise an expression into a single bracket.
- Solve one step equations.
- Solve two step equations.
- Solve equations with brackets.
- Solve equations with unknowns on both sides.

Key Words

Inverse: This is another word for opposite. We complete the opposite operation to the one shown in the question.

Expression: Shows a mathematical relationship whereby there is no solution.

Equation: A mathematical statement that shows that two expressions are equal.

Factorise: Putting an expression into brackets by finding the HCF.

Solve: To get the solution or answer to a question.

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Factorising

Factorising: To factorise an expression we need to find the highest common factor of all of the terms in the expression.

Expression: $6x + 15$

The HCF of $6x$ and $15 = 3$

$$6x \div 3 = 2x$$

$$15 \div 3 = 5$$

$6x$ and 15 are both in the 3 times table.

The terms from dividing by the HCF.

Answer: $3(2x + 5)$

HCF

Expression: $4x^2 - 6x$

The HCF of $4x^2$ and $6x = 2x$

$$4x^2 \div 2x = 2x$$

$$6x \div 2x = 3$$

$4x^2$ and $6x$ are both in the 2 times table and both contain an x .

The terms from dividing by the HCF.

Answer: $2x(2x - 3)$

HCF

Solving one step equations

To solve any equation we need to do the inverse of the operation that we see.

$$t + 4 = 10$$

$$\begin{array}{cc} -4 & -4 \end{array}$$

$$t = 6$$

The inverse of add is subtract and vice versa.

$$c - 3 = 6$$

$$\begin{array}{cc} +3 & +3 \end{array}$$

$$c = 9$$

$$6y = 30$$

$$\begin{array}{cc} \div 6 & \div 6 \end{array}$$

$$y = 5$$

The inverse of multiply is divide and vice versa.

$$\frac{m}{7} = 4$$

$$\begin{array}{cc} \times 7 & \times 7 \end{array}$$

$$m = 28$$

Year 8 Knowledge Organiser EXPRESSIONS & EQUATIONS

Solving two step equations

To solve a two step equation we need to complete 2 inverse calculations in a specific order.

$$6y + 2 = 32$$

$-2 \quad -2$

Subtract first because the 2 is separate from the y.

$$6y = 30$$

$\div 6 \quad \div 6$

Divide because it is the inverse of multiplying.

$$y = 5$$

$$\frac{w-5}{3} = 4$$

$\times 3 \quad \times 3$

Multiply first because the entire expression is divided by 3.

$$w - 5 = 12$$


$+5 \quad +5$

Add because it is the inverse of subtracting.

$$w = 17$$

Solving equations with brackets

We must expand the bracket first and then solve by doing the inverse of the operations.


$$3(2x + 5) = 39$$

Expand brackets first.

$$6x + 15 = 39$$

$-15 \quad -15$

The inverse of +15 is -15.

$$6x = 24$$

$\div 6 \quad \div 6$

The inverse of $\times 6$ is $\div 6$.

$$x = 4$$

Solving with unknowns on both sides

To solve an equation with unknowns on both sides we need to collect all of the same terms together, still by looking at the inverse.

$$5x - 20 = 3x + 4$$

$-3x \quad -3x$

We subtract 3x from both sides because it is the smaller term of x.

$$2x - 20 = 4$$

$+20 \quad +20$

$$2x = 24$$

$\div 2 \quad \div 2$

Then solve like a normal two step equation.

$$x = 12$$

$$2x - 10 = 5x + 2$$

$-2x \quad -2x$

We subtract 2x from both sides because it is the smaller term of x.

$$-10 = 3x + 2$$

$-2 \quad -2$

$$-12 = 3x$$

$\div 3 \quad \div 3$

Then solve like a normal two step equation.

$$-4 = x$$

Top tip: Always subtract/add the smaller number of terms to avoid getting a negative term at the end.

Year 8 Knowledge Organiser EXPRESSIONS & FORMULAE

What do I need to be able to do?

- Simplify expressions by collecting like terms.
- Write an expression from a given sentence.
- Expand a single bracket.
- Substitute into an expression or formula.

Key Words

Formula: A rule written using symbols that describe a relationship between different quantities.

Expression: Shows a mathematical relationship whereby there is no solution.

Equation: A mathematical statement that shows that two expressions are equal.

Term: This is a number and a letter put together, for example $3x$ is a term.

Expanding brackets

Each term inside the bracket it multiplied by this value.

$$\begin{aligned} & 2(3a - 4) \\ &= 6a - 8 \\ &= 6a - 8 \end{aligned}$$

Expanding: To expand a bracket you multiply each term on the inside of the bracket by the term on the outside of the bracket. It is very important that you multiply all of the terms.

Simplifying expressions

The operation symbol in front of the term tells you what to do.

Simplify:

$$\begin{aligned} & 4a + 3b - a + 2b \\ &= 3a + 5b \end{aligned}$$

Collecting like terms: You can only collect terms with the same letter together. The 'a' terms can only be collected with other 'a' terms. The operation symbol in front of the terms tells you what to do with it.

Expand and simplify:
 $2(4a + 2b) - 2(a + 3b)$

$$\begin{aligned} & 8a + 4b - 2a - 6b \\ &= 6a - 2b \end{aligned}$$

Expanding and collecting like terms: You need to first expand the brackets separately and then collect the terms with the same letter like you would in the previous question.

Year 8 Knowledge Organiser EXPRESSIONS & FORMULAE

Expressions

Expression: An expression is a group of numbers, letters and operation symbols. It is important that you read the words carefully and work out their meaning before deciding on the most suitable operation. It never has an equals sign.

More than = add
Less than = subtract
Always check the wording carefully.

Add 14 to a $a + 14$
Subtract 20 from b $b - 20$
Multiply c by 4 $4c$
12 more than d $d + 12$
Multiply e by 3 and subtract 5 $3e - 5$
Add 12 to f and then multiply by 2 $2(f + 12)$

Formulae

Formulae: The word formula has two possible plural forms, formulae and formulas.

A formula is a special type of equation that shows the relationship between different variables. Formulae are often used in geometry topics to find area and volume.

Values would be substituted into the formula in the correct place.

Area of rectangle =
length \times width

Area of triangle =
(base \times height) \div 2

(12.5 \times hours worked)
+ 25 = cost of job

Equations

Equation: An equation is a number statement with an equals sign. Expressions on either side of the equals sign are of equal value. There is always a solution or answer to an equation.

To solve the equation you would then do the inverse of the calculation you can see. Inverse means the opposite.

$$\begin{aligned}d + 12 &= 30 \\d &= 30 - 12 \\d &= 18\end{aligned}$$

$$\begin{aligned}a + 14 &= 20 \\b - 20 &= 15 \\4c &= 28 \\d + 12 &= 30 \\3e - 5 &= 10 \\2(f + 12) &= 44\end{aligned}$$

Substitution

Substitution: This is where we replace the letter we see for the number that it is worth.

For example: If $w = 6$ and $y = 5$

Remember that $3y$ means 3 multiplied by the value of y .

a) $w + 5 = 6 + 5 = 11$

b) $3y - 2 = 3 \times 5 - 2 = 15 - 2 = 13$

c) $8w + 2y = 8 \times 6 + 2 \times 5 = 48 + 10 = 58$



Year 9

Autumn Term - Term 1

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Year 9 Knowledge Organiser INDICES & STANDARD FORM

What do I need to be able to do?

- Use the laws of indices to simplify expressions.
- Convert between ordinary numbers and standard form and vice versa.
- Multiply and divide with standard form.
- Add and subtract with standard form.

Key Words

Square: A square number is the result of multiplying a number by itself.

Cube: A cube number is the result of multiplying a number by itself twice.

Root: A root is the reverse of a power.

Prime number: A prime is a number that has only two factors which are 1 and itself.

Indices: These are the squares, cubes and powers.

Standard form: This is a way of writing really big or really small numbers.

Ordinary numbers: These are numbers that are not yet in standard form. They are the normal form we see numbers in.

Laws of indices

Multiplication law: When multiplying with the same base (number/letter) we add the powers.

General rule: $a^m \times a^n = a^{m+n}$

$$2^5 \times 2^7 = 2^{5+7} = 2^{12}$$

$$x^3 \times x^8 = x^{3+8} = x^{11}$$

When multiplying the terms we add the powers together.

Division law: When dividing with the same base (number/letter) we subtract the powers.

General rule: $a^m \div a^n = a^{m-n}$

$$2^{14} \div 2^7 = 2^{14-7} = 2^7$$

$$x^{10} \div x^8 = x^{10-8} = x^2$$

When dividing the terms we subtract the powers together.

Brackets law: When raising a power to another power we multiply the powers together.

General rule: $(a^m)^n = a^{m \times n}$

$$(5^4)^2 = 5^{4 \times 2} = 5^8$$

$$(h^9)^3 = h^{9 \times 3} = h^{27}$$

When raising to a power we multiply the powers together.

Key facts: You need to also remember that:

$$p = p^1$$

$$p^0 = 1$$

Anything to the power zero is equal to 1.

Year 9 Knowledge Organiser INDICES & STANDARD FORM

Converting with standard form

Ordinary numbers: To change between ordinary numbers and standard form we need to use a power of 10.

$$120000 = 1.2 \times 10^5$$

This number need to be bigger than 1 and less than 10 to be in standard form.

$$0.005 = 5 \times 10^{-3}$$

Positive power = very big number.
Negative power = very small number.

Standard form: To change numbers from standard form back to ordinary numbers we multiply by the power of 10.

$$7.32 \times 10^4 = 73200$$

The power tells us how many places to move not how many zeros to add.

$$2.4 \times 10^{-3} = 0.0024$$

Multiplying standard form

Multiply standard form: We multiply the numbers and add the powers.

$$(5 \times 10^4) \times (7 \times 10^6)$$

$$= 35 \times 10^{10}$$

$$= 3.5 \times 10^{11}$$

This is not in standard form because 35 is not less than 10.

$$(3.2 \times 10^3) \times (4 \times 10^4)$$

$$= 12.8 \times 10^7$$

$$= 1.28 \times 10^8$$

Remember to add the powers together.

Dividing standard form

Divide standard form: We divide the numbers and subtract the powers.

$$(8 \times 10^9) \div (2 \times 10^6)$$

$$= 4 \times 10^3$$

This is already in standard form because 4 is less than 10.

$$(1.2 \times 10^5) \div (2 \times 10^2)$$

$$= 0.6 \times 10^3$$

$$= 6 \times 10^2$$

This is not in standard form because 0.6 is less than 1.

Adding and subtracting standard form

To add and subtract with standard form we must convert out of standard form into ordinary numbers first and then add/subtract.

$$(8.1 \times 10^5) + (2 \times 10^3)$$

Convert into ordinary numbers.

$$= 810000 + 2000$$

$$= 812000$$

$$= 8.12 \times 10^5$$

Add/subtract.

$$(2.35 \times 10^5) - (4.1 \times 10^3)$$

$$= 235000 - 4100$$

$$= 230900$$

$$= 2.309 \times 10^5$$

Change back into standard form.

Year 9 Knowledge Organiser NUMBER PROPERTIES

What do I need to be able to do?

- Recognise and calculate square numbers and roots.
- Recognise and calculate cube numbers and roots.
- Use BIDMAS to complete calculations.
- Identify factors and multiples.
- Identify a prime number and complete a prime factor tree.

Key Words

Square: A square number is the result of multiplying a number by itself.

Cube: A cube number is the result of multiplying a number by itself twice.

Root: A root is the reverse of a power.

Prime number: A prime is a number that has only two factors which are 1 and itself.

Multiple: A number in the given numbers times table.

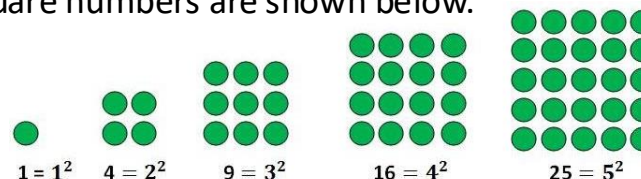
Factor: A number that fits into another number exactly.

Operation: In maths these are the functions $\times \div + -$.

Indices: These are the squares, cubes and powers.

Squares, cubes and roots

Square numbers: This is when we multiply a number by itself, the first 5 square numbers are shown below.



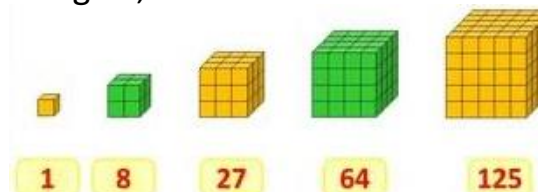
Square roots: This is the number that we started with to get the square numbers.

$$\sqrt{49} = 7 \text{ because } 7 \times 7 \text{ is } 49$$

$$\sqrt{100} = 10 \text{ because } 10 \times 10 \text{ is } 100$$

Remember the answer is 7 not 7x7.

Cube numbers: This is when we multiply a number by itself and then by itself again, the first 5 cube numbers are shown below.



Index form

Index number: An index number is a number which is raised to a power. The power, also known as the index, tells you how many times you have to multiply the number by itself.

2^5 is the index notation.

$$2^5 = 2 \times 2 \times 2 \times 2 \times 2 = 32$$

Year 9 Knowledge Organiser NUMBER PROPERTIES

Multiples and factors

Multiples: The result of multiplying a number by an integer. It is the times table of a number.

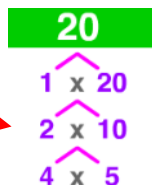
Multiples of 4: 4, 8, 12, 16, 20 ...

Multiples of 5: 5, 10, 15, 20, 25...

Multiples are the list of times tables.

Factors: A number that divides exactly into another number without a remainder. It is often helpful to write them in pairs.

Write them in pairs first so you don't miss any!



Factors of 20 = 1, 2, 4, 5, 10, 20

Prime numbers

Prime: This is a number that has exactly 2 factors; 1 and itself.

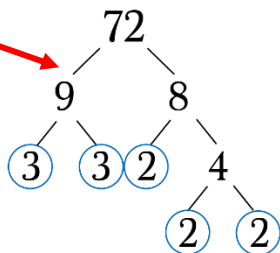
2 is the only even prime. The first 10 prime numbers are:

2, 3, 5, 7, 11, 13, 17, 19, 23, 29

These are not the only prime numbers.

Prime factorisation: This is when we split a number into its prime factors using a factor tree. We circle the prime factors.

We need to find pairs of numbers that multiply to give the number above.



If a number is repeated we write it as a power.

$$72 = 2^3 \times 3^2$$

BIDMAS – order of operations

B Brackets

I Indices

D Division

M Multiplication

A Addition

S Subtraction

If a calculation contains the circled calculations then you need to work from left to right.

$$5 \times 4 - 8 \div 2$$

$$20 - 4 = 16$$

This question can be split into two separate calculations which are then combined to get the answer.

We need to deal with the powers inside the brackets first by calculating 2^2 .

$$(2^2 + 6)^2 \times 4 - 8$$

$$(4 + 6)^2 \times 4 - 8$$

$$(10)^2 \times 4 - 8$$

Once the bracket has been fully calculated we then look at the operations on the outside of the bracket.

$$100 \times 4 - 8$$

$$400 - 8 = 392$$

Year 9 Knowledge Organiser EXPRESSIONS & EQUATIONS

What do I need to be able to do?

- Factorise an expression into a single bracket.
- Solve one step equations.
- Solve two step equations.
- Solve equations with brackets.
- Solve equations with unknowns on both sides.

Key Words

Inverse: This is another word for opposite. We complete the opposite operation to the one shown in the question.

Expression: Shows a mathematical relationship whereby there is no solution.

Equation: A mathematical statement that shows that two expressions are equal.

Factorise: Putting an expression into brackets by finding the HCF.

Solve: To get the solution or answer to a question.

Factorising

Factorising: To factorise an expression we need to find the highest common factor of all of the terms in the expression.

Expression: $6x + 15$

The HCF of $6x$ and $15 = 3$

$$6x \div 3 = 2x$$

$$15 \div 3 = 5$$

$6x$ and 15 are both in the 3 times table.

The terms from dividing by the HCF.

Answer: $3(2x + 5)$

HCF

Expression: $4x^2 - 6x$

The HCF of $4x^2$ and $6x = 2x$

$$4x^2 \div 2x = 2x$$

$$6x \div 2x = 3$$

$4x^2$ and $6x$ are both in the 2 times table and both contain an x .

The terms from dividing by the HCF.

Answer: $2x(2x - 3)$

HCF

Solving one step equations

To solve any equation we need to do the inverse of the operation that we see.

$$t + 4 = 10$$

$$\begin{matrix} -4 & -4 \end{matrix}$$

$$t = 6$$

The inverse of add is subtract and vice versa.

$$c - 3 = 6$$

$$\begin{matrix} +3 & +3 \end{matrix}$$

$$c = 9$$

$$6y = 30$$

$$\begin{matrix} \div 6 & \div 6 \end{matrix}$$

$$y = 5$$

The inverse of multiply is divide and vice versa.

$$\frac{m}{7} = 4$$

$$\begin{matrix} \times 7 & \times 7 \end{matrix}$$

$$m = 28$$



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Year 9 Knowledge Organiser EXPRESSIONS & EQUATIONS

Solving two step equations

To solve a two step equation we need to complete 2 inverse calculations in a specific order.

$$6y + 2 = 32$$

$-2 \quad -2$

Subtract first because the 2 is separate from the x.

$$6y = 30$$

$\div 6 \quad \div 6$

Divide because it is the inverse of multiplying.

$$y = 5$$

$$\frac{w-5}{3} = 4$$

$\times 3 \quad \times 3$

Multiply first because the entire expression is divided by 3.

$$w - 5 = 12$$

$+5 \quad +5$

Add because it is the inverse of subtracting.

$$w = 17$$

Solving equations with brackets

We must expand the bracket first and then solve by doing the inverse of the operations.

$$3(2x + 5) = 39$$

Expand brackets first.

$$6x + 15 = 39$$

$-15 \quad -15$

The inverse of +15 is -15.

$$6x = 24$$

$\div 6 \quad \div 6$

The inverse of $\times 6$ is $\div 6$.

$$x = 4$$

Solving with unknowns on both sides

To solve an equation with unknowns on both sides we need to collect all of the same terms together, still by looking at the inverse.

$$5x - 20 = 3x + 4$$

$-3x \quad -3x$

We subtract 3x from both sides because it is the smaller term of x.

$$2x - 20 = 4$$

$+20 \quad +20$

Then solve like a normal two step equation.

$$2x = 24$$

$\div 2 \quad \div 2$

$$x = 12$$

$$2x - 10 = 5x + 2$$

$-2x \quad -2x$

We subtract 2x from both sides because it is the smaller term of x.

$$-10 = 3x + 2$$

$-2 \quad -2$

Then solve like a normal two step equation.

$$-12 = 3x$$

$\div 3 \quad \div 3$

$$-4 = x$$

Top tip: Always subtract/add the smaller number of terms to avoid getting a negative term at the end.

Year 9 Knowledge Organiser EXPRESSIONS & FORMULAE

What do I need to be able to do?

- Simplify expressions by collecting like terms.
- Write an expression from a given sentence.
- Expand a single bracket.
- Substitute into an expression or formula.
- Expand double brackets.
- Rearrange a formula.

Key Words

Formula: A rule written using symbols that describe a relationship between different quantities.

Expression: Shows a mathematical relationship whereby there is no solution.

Equation: A mathematical statement that shows that two expressions are equal.

Term: This is a number and a letter put together, for example $3x$ is a term.

Rearrange: Complete inverse operations to change the structure of the formula.

Expanding brackets

Each term inside the bracket it multiplied by this value.

$$\begin{aligned} & 2(3a - 4) \\ &= 6a - 8 \\ &= 6a - 8 \end{aligned}$$

Expanding: To expand a bracket you multiply each term on the inside of the bracket by the term on the outside of the bracket. It is very important that you multiply all of the terms.

Simplifying expressions

The operation symbol in front of the term tells you what to do.

Simplify:

$$\begin{aligned} & 4a + 3b - a + 2b \\ &= 3a + 5b \end{aligned}$$

Collecting like terms: You can only collect terms with the same letter together. The 'a' terms can only be collected with other 'a' terms. The operation symbol in front of the terms tells you what to do with it.

Expand and simplify:

$$\begin{aligned} & 2(4a + 2b) - 2(a + 3b) \\ &= 8a + 4b - 2a - 6b \\ &= 6a - 2b \end{aligned}$$

Expanding and collecting like terms: You need to first expand the brackets separately and then collect the terms with the same letter like you would in the previous question.

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Year 9 Knowledge Organiser EXPRESSIONS & FORMULAE

Expanding double brackets

Expanding: To expand double brackets we need to use a grid to make sure that all of the terms have been multiplied together.

$$(x + 1)(x + 4)$$

×	x	+1
x	x^2	$+1x$
+4	$+4x$	$+4$

$$= x^2 + 1x + 4x + 4$$

$$= x^2 + 5x + 4$$

First bracket along the top and the second down the side.

Multiply all of the terms together.

Simplify the expression.

$$(2x + 1)(x - 3)$$

	2x	+	1
x	$2x^2$		$1x$
-3	$-6x$		-3

$$= 2x^2 + 1x - 6x - 3$$

$$= 2x^2 - 5x - 3$$

Substitution

Substitution: This is where we replace the letter we see for the number that it is worth.

Remember that 3y means 3 multiplied by the value of y.

For example: If $w = 6$ and $y = 5$

a) $3y - 2 = 3 \times 5 - 2 = 15 - 2 = 13$

b) $8w + 2y = 8 \times 6 + 2 \times 5 = 48 + 10 = 58$

c) $2w^2 - 7 = 2 \times 6^2 - 7 = 72 - 7 = 65$

Calculate the powers first then multiply by the number in front.

Rearranging formulae

To rearrange a formula we use the same method that we would use to solve an equation however, we do not get a solution.

To make y the subject of this formula:

$$6y + 2 = x$$

$$\begin{matrix} -2 & -2 \end{matrix}$$

Subtract first because the 2 is separate from the y.

$$6y = x - 2$$

$$\begin{matrix} \div 6 & \div 6 \end{matrix}$$

Divide because it is the inverse of multiplying.

$$y = \frac{x - 2}{6}$$

y is now the subject of the formula because it is $y =$ not $x =$.

To make x the subject of this formula:

$$6x - 2c = 3x + 4$$

$$\begin{matrix} -3x & -3x \end{matrix}$$

We subtract 3x from both sides because it is the smaller amount of x and there are x's on both sides.

$$3x - 2c = 4$$

$$\begin{matrix} +2c & +2c \end{matrix}$$

Add 2c to both sides because x needs to be on its own.

$$3x = 2c + 4$$

$$\begin{matrix} \div 3 & \div 3 \end{matrix}$$

$$x = \frac{2c + 4}{3}$$

x is now the subject of the formula because it is $x =$.

Year 9 Knowledge Organiser AVERAGES & RANGE

What do I need to be able to do?

- Calculate averages and range from a list.
- Explain the difference between discrete and continuous data.
- Calculate averages from a discrete table.
- Calculate averages from grouped data.
- Calculate the IQR from a set of data.

Key Words

Mean: Add all of the numbers together and divide by how many there were.

Range: The biggest number subtract the smallest number.

Mode: The value there the most times.

Median: The middle number when they are in order.

Frequency: The number which tells us how many pieces of data there are.

Discrete: Data that can only take certain values.

Continuous: Data that can take certain values in a given range.

IQR: Inter quartile range is the range for the middle 50% of the data.

Averages and range from a list

Here is a list of numbers: 12, 15, 10, 8, 15

Mean: The mean is the average of a set of data.

Add all of the values together $12 + 15 + 10 + 8 + 15 = 60$
Divide this by the number of values in your list $60 \div 5 = 12$
The mean of this data is 12.

Mode: This is the value that appears the most times in the list. So if we look at the list above then the mode would be 15 because 15 appears twice in the list.

Range: This is the difference between the biggest and smallest numbers in the list.
 $15 - 8 = 7$ so the range for the list above is 7.

Median: This is the middle number but only when the list is in order from smallest to biggest.

8 10 12 15 15

This is in the middle so it must be the median.

12 is in the middle of the list so the median must be 12.

Year 9 Knowledge Organiser AVERAGES & RANGE

Averages from a table

5 3 4 5 6 7 2 3 6 3 5 3 2 7 6 4 3 5 5 6 2 3 3 6 5

Score x	Tally	Frequency f	Freq \times Score fx
2		3	6
3		7	21
4		2	8
5		6	30
6		5	30
7		2	14

To calculate the mean we need to add in an extra column for score \times frequency.

$$\text{Mean} = \frac{\text{Total of freq } \times \text{ score}}{\text{Total freq}}$$

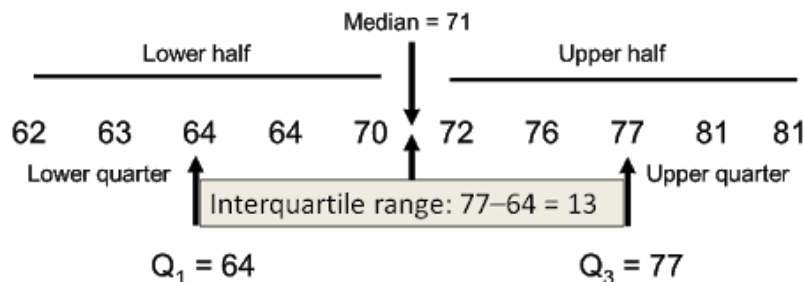
$$\text{Mean} = \frac{109}{25} = 4.36$$

Mode = 3 because the score of 3 has the highest frequency.

$$\text{Range} = 7 - 2 = 5$$

The range is always from the first column.

Interquartile range (IQR)



Calculate the median first. Then first the LQ and the UQ. The IQR is then the difference between these 2 values.

Averages from a table – Grouped data

To calculate the mean from a grouped frequency table we need to add on 2 columns, one for the midpoint and one for the frequency \times midpoint.

number of laps	frequency	midpoint(x)	mp \times f
1 - 5	2	3	6
6 - 10	9	8	72
11 - 15	15	13	195
16 - 20	20	18	360
21 - 25	17	23	391
26 - 30	25	28	700
31 - 35	2	33	66
36 - 40	1	38	38
	$\sum f = 91$		$\sum fx = 1828$

Calculate the midpoint of the group, $\frac{1+5}{2} = 3$.

Divide the total of the midpoint \times freq column by the total of the freq column.

$$\text{Mean} = \frac{1828}{91} = 20.1$$

Mode = 26 - 30 because this group has the highest frequency.

Median = $\frac{91+1}{2} = 46$ (the 46th piece of data is the median. We need to find which group it is in. We start with the top frequency and keep adding the frequencies together until we get 46.

$2 + 9 + 15 + 20 = 46$ so the group 16 - 20 is the median.

Year 9 Knowledge Organiser REPRESENTING DATA

What do I need to be able to do?

- Read and draw a pie chart using a protractor.
- Draw a stem and leaf diagram.
- Draw a scatter graph.
- Identify outliers on a scatter graph.
- Draw a line of best fit on a scatter graph.
- Estimate values from a scatter graph.

Key Words

Frequency: The number which tells us how many pieces of data there are.

Protractor: This is a piece of equipment used to measure angles.

Scatter graph: This is a graph that shows the relationship between two variables.

Correlation: This describes if the data is increasing or decreasing.

Line of best fit: This is a line drawn on a scatter graph that follows the trend of the data.

Outlier: This is a data point that does not fit with the pattern of the rest of the data.

Pie charts

Pie charts represent discrete data. A circle is divided into segments, where each segment represents a data category. The size of each segment matches its proportion of the total amount.

Sport	Frequency	Angle
Swimming	12	$12 \times 15 = 180^\circ$
Netball	6	$6 \times 15 = 90^\circ$
Football	3	$3 \times 15 = 45^\circ$
Gymnastics	3	$3 \times 15 = 45^\circ$

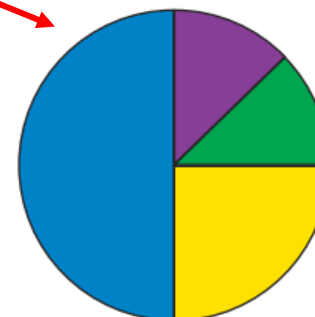
Total = 24

Each person: $360^\circ \div 24 = 15^\circ$

1. Find the total frequency.
2. Calculate one person by doing $360^\circ \div$ frequency.
3. Multiply each frequency by this value to get the angle size for each section.

You must use a protractor carefully to measure each section.

A pie chart to show children's favourite sports



Key

- swimming
- netball
- football
- gymnastics

You must label each section or use a key.

Year 9 Knowledge Organiser REPRESENTING DATA

Stem and leaf diagrams

Stem and leaf diagram: This is a plot where each data value is split into a "leaf" (usually the last digit) and a "stem" (the other digits). The leaf part is only ever 1 digit, the stem can be several.

Here is a list of numbers and the stem and leaf diagram:

68, 75, 77, 79, 80, 82, 92, 96, 96, 97

Stem	Leaf
6	8
7	5 7 9
8	0 2
9	2 6 6 7

The 'leaves' must be from smallest to biggest in each row.

Key 6|8 = 68

You must include a key to explain what the stem and leaf shows.

Mode = 96 because 96 appears twice.

Median = 81 because 81 is in the middle of 80 and 82.

Range = $97 - 68 = 29$.

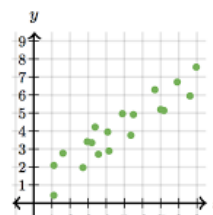
Mean = $\frac{68+75+77+79+80+82+92+96+96+97}{10} = 84.2$

We calculate these in the same way we would from a list.

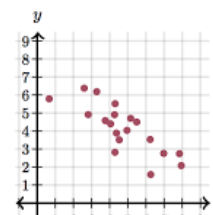
Scatter graphs

Scatter graph: This is a graph of plotted points that show the relationship between two sets of data.

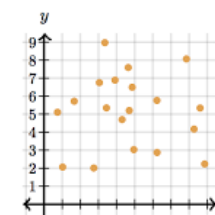
Types of correlation:



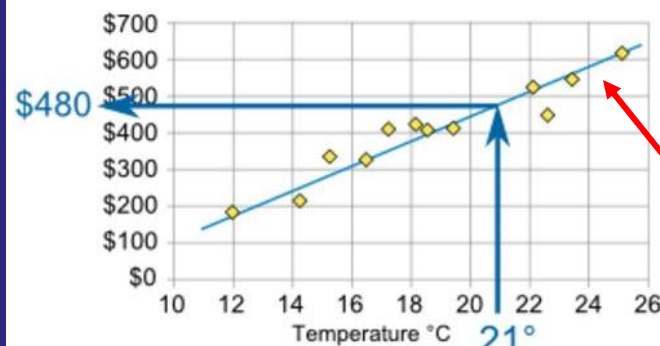
Positive



Negative



No correlation



The line of best fit needs to follow the trend of the data and have around half of the points either side. It does not need to start from 0.

Correlation: Positive correlation.

Description: As the temperature increases so does the amount of money made.

Estimate: $21^{\circ}\text{C} = \$480$.

Year 9 Knowledge Organiser REPRESENTING DATA

What do I need to be able to do?

- Complete a tally chart and design a data collection sheet.
- Complete and read information from a pictogram.
- Draw and read a bar chart and dual bar chart.
- Compare and interpret data in different contexts.
- Draw, read and compare box plots.

Key Words

Range: The biggest number subtract the smallest number.

Mode: The value there the most times.

Median: The middle number when they are in order.

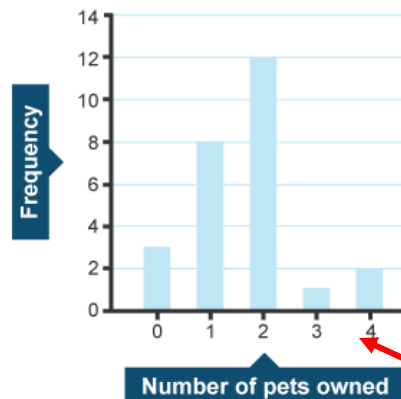
Frequency: The number which tells us how many pieces of data there are.

Bar chart: A diagram where the bars represent the frequency.

Box plot: A rectangular box that splits the data into 4 quartiles.

Interquartile range: This refers to the central 50% of data.

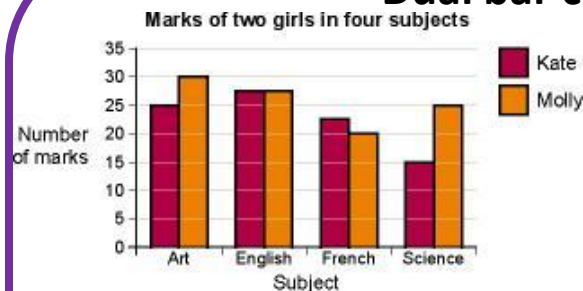
Bar Charts



A bar chart has a horizontal axis and a vertical axis. The x axis is for the type of data and the y axis shows the frequency. The bars show the data value of each category. There must be a gap between each bar and the scale must increase in the same sized intervals and the axes must be labelled.

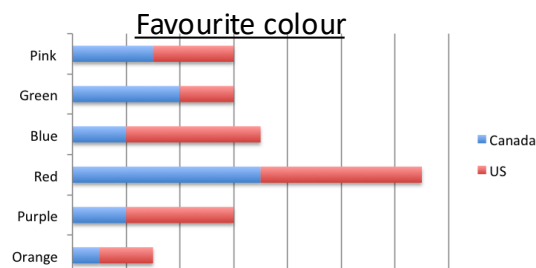
You must include gaps and labels.

Dual bar charts



You must include a key!

A dual bar chart is has most of the same features of a single bar chart. The bars show the data value of each category but this time there are 2 variables, usually 2 people of male/female. You must include a key.

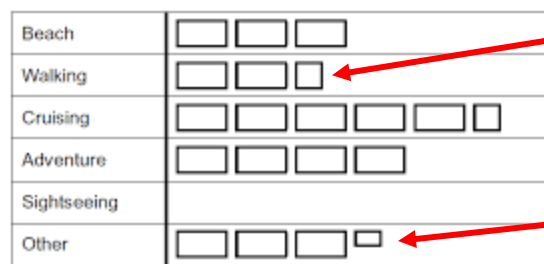


Year 9 Knowledge Organiser REPRESENTING DATA

Pictograms

Pictograms are similar to bar charts, but the data is shown in pictures. A pictogram must have a key so that you know what a full image represents.

Looking at this diagram:



This represents 2 people because it is half of the diagram in the key.

This represents 1 person because it is a quarter of the diagram in the key.

Key :  represents 4 people.

Beach would show $4 + 4 + 4 = 12$ people.

Walking would show $4 + 4 + 2 = 10$ people.

Sightseeing has a total of 7 people and would be represented as:



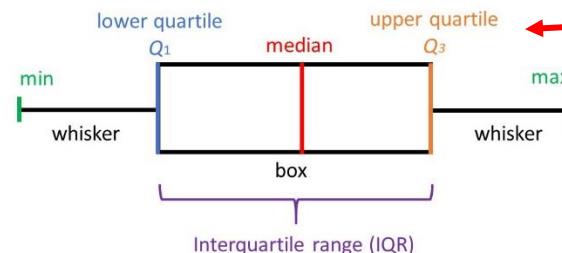
Interpreting data

Information can be shown in tables, charts or graphs.

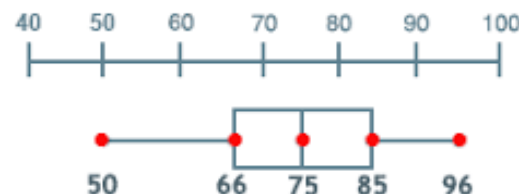
Interpreting data simply means understanding or working out what is being shown by a table, graph or chart and being able to answer questions about that information.

Box Plots

Box plot: This is a graphic way to display the median, quartiles, and extremes of a data set on a number line to show the distribution of the data.



Sometimes we won't be given all of this, we may be given the range and have to use this to find the min or max.



Data = 50, 60, 66, 70, 75, 80, 85, 89, 96
 Minimum = 50
 Lower Quartile = 66
 Median = 75
 Upper Quartile = 85
 Maximum = 96

To find the IQR: $UQ - LQ$.

$$IQR = 85 - 66 = 19$$

Comparing box plots: You must make sure that you compare:

- The median values
- The IQR or the range

One of these points must link back to the context of the question.

Year 9 Knowledge Organiser FDP

What do I need to be able to do?

- Convert between fractions, decimals and percentages.
- Calculate a percentage of an amount.
- Use a multiplier to calculate a percentage of an amount.
- Calculate a percentage increase.
- Calculate a percentage decrease.

Key Words

Fraction: A fraction is made up of a numerator (top) and a denominator (bottom).

Integer: Whole number.

Ascending Order: Place in order, smallest to largest.

Descending Order: Place in order, largest to smallest.

Percentage: Out of one hundred.

Decimal: A decimal is a fraction written in a special form e.g. 0.6.

Multiplier: This is used to calculate percentages when we have a calculator.

Increase: When an amount goes up.

Decrease: When an amount goes down.

Fractions, decimals and percentages

You need to be able to convert between fractions, decimals and percentages.

Percentages:

$$30\% = 0.30 \text{ or } 0.3 = \frac{30}{100} \text{ or } \frac{3}{10}$$

$$8\% = 0.08 = \frac{8}{100} \text{ or } \frac{4}{50} \text{ or } \frac{2}{25}$$

We sometimes have to then simplify our fraction using common times tables.

Percent means out of 100 so this is why we start with 100 as the denominator.

Decimals:

$$0.15 = 15\% = \frac{15}{100} \text{ or } \frac{3}{20}$$

$$0.02 = 2\% = \frac{2}{100} \text{ or } \frac{1}{50}$$

If the decimal has 0 tenths then it is less than 10%.

Fractions:

$$\frac{45}{100} = 0.45 = 45\%$$

$$\frac{12}{50} \text{ or } \frac{24}{100} = 0.24 = 24\%$$

Unless we know the answer we must make the denominator 100 then convert.

These are some of the conversions that you need to learn.

Top tips - To convert:

- Percentages to decimals divide by 100.
- Decimals to percentages multiply by 100.
- Percentages to fractions, put over 100.
- Fractions make sure the denominator is 100.

F	D	P
$\frac{1}{100}$	0.01	1%
$\frac{1}{10}$	0.1	10%
$\frac{1}{5}$	0.2	20%
$\frac{1}{4}$	0.25	25%
$\frac{1}{2}$	0.5	50%
$\frac{3}{4}$	0.75	75%



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Year 9 Knowledge Organiser FDP

Percentage of an amount – Non calculator

To calculate any percentage it is useful to start with 10%.

30% of 120: $10\% = 120 \div 10 = 12$ To find 10% we divide by 10.
 $30\% = 3 \times 12 = 36$ To find 30% we multiply 10% by 3.

45% of 80: $10\% = 80 \div 10 = 8$ $5\% = 8 \div 2 = 4$
 $40\% = 4 \times 8 = 32$ 5% is half of 10% so we divide by 2.
 $45\% = 40\% + 5\% = 32 + 4 = 36$

To find 1% we divide the starting amount by 100.

$1\% \text{ of } 30 = 30 \div 100 = 0.3.$

Percentage of an amount – Calculator

When we have a calculator we can use a multiplier; this is the decimal equivalent of the percentage.

80% of 120: $80\% = 0.80$ Change the percentage to a decimal and then multiply.
 $80\% \text{ of } 120 = 0.80 \times 120 = 96$

33% of 90: $33\% = 0.33$ Be careful if the percentage is less than 10.
 $33\% \text{ of } 90 = 0.33 \times 90 = 29.7$

4% of 88: $4\% = 0.04$ Take care using decimal percentages, still divide by 100.
 $4\% \text{ of } 88 = 0.04 \times 88 = 3.52$

12.5% of 42: $12.5\% = 0.125$
 $12.5\% \text{ of } 42 = 0.125 \times 42 = 5.25$

Percentage increase and decrease

Increase: To calculate a percentage increase we calculate the percentage and add the value on to the original amount.

Non Calculator: Increase 70 by 65%

$10\% = 70 \div 10 = 7$ $5\% = 7 \div 2 = 3.5$

$60\% = 6 \times 7 = 42$

$65\% = 60\% + 5\% = 42 + 3.5 = 45.5$ Calculate 65% by splitting into 10% and 5% and then add the answer on to the original amount.

$70 + 45.5 = 115.5$

Calculator: Increase 130 by 26%

Calculate 26% using a multiplier and add this answer onto the original amount.

$26\% \text{ of } 130 = 0.26 \times 130 = 33.8$

$130 + 33.8 = 163.8$

Decrease: To calculate a percentage decrease we calculate the percentage and subtract the value off the original amount.

Non Calculator: Decrease 20 by 35%

$10\% = 20 \div 10 = 2$ $5\% = 2 \div 2 = 1$

$30\% = 3 \times 2 = 6$

$35\% = 30\% + 5\% = 6 + 1 = 7$ Calculate 35% by splitting into 10% and 5% and then subtract the answer off the original amount.

$20 - 7 = 13$

Calculator: Decrease 65 by 14%

Calculate 14% using a multiplier and subtract this answer off the original amount.

$14\% \text{ of } 65 = 0.14 \times 65 = 9.1$

$65 - 9.1 = 55.9$

Year 9 Knowledge Organiser MULTIPLICATIVE REASONING

What do I need to be able to do?

- Enlarge a shape using a scale factor.
- Enlarge a shape with a fractional or negative scale factor.
- Calculate with compound interest.
- Calculate with reverse percentages to find the original value.
- Solve direct/inverse proportion problems.

Key Words

Enlargement: A change in size, either bigger or smaller.

Scale factor: This is how much the shape increases or decreases by.

Percentage: Out of one hundred.

Decimal: A decimal is a fraction written in a special form e.g. 0.6.

Multiplier: This is used to calculate percentages when we have a calculator.

Compound interest: Calculating interest where interest earned over time is added to the original value.

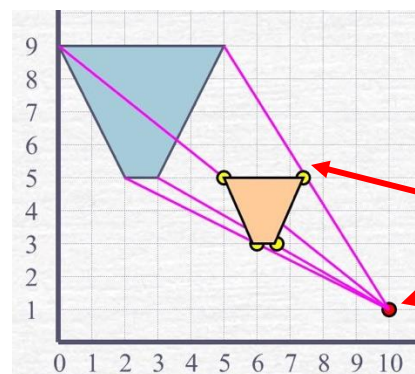
Direct proportion: Where both variables increase.

Inverse proportion: One variable increases and the other decreases.

Enlargement

An enlargement is when a shape changes in size by using a scale factor. The scale factor can make a shape bigger or smaller. A scale factor of 2 = shape doubles in size, a scale factor of $\frac{1}{2}$ would halve the size.

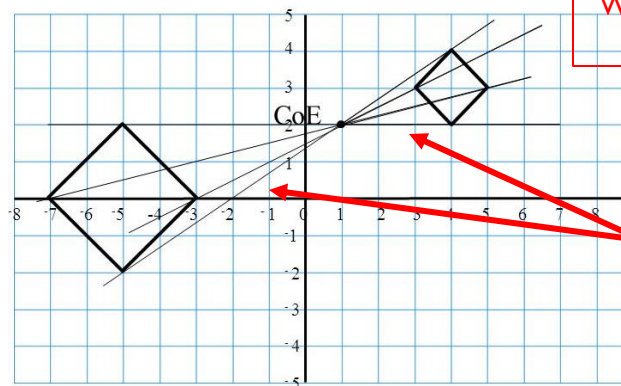
Fractional enlargements: Enlargement SF $\frac{1}{2}$ with centre (10,1).



Depending on the fraction the shape could be made bigger or smaller.

The shape is half the size. We divided the distance from the centre to the original shape by 2.

Negative enlargements: Enlargement SF -2 with centre (1, 2).



We can also have scale factors that are negative fractions.

The shape is twice the size but because it is a negative scale factor, we measure the increased difference from the centre in the opposite direction.

Year 9 Knowledge Organiser MULTIPLICATIVE REASONING

Compound interest

Compound Interest means that you work out the interest for the first period, add it to the total, and then calculate the interest for the next period etc.

Below is a formula we can use to make the calculation quicker.

$$\text{Amount of money after } x \text{ years} = \text{amount} \times \text{multiplier}^x$$

Tess invested £5000 at 4% compound interest for five years. How much was the investment worth after five years?

$$5000 \times 1.04^5 = £6083.26$$

Remember to round money to 2dp.

$$100\% + 4\% = 104\% = 1.04$$

Reverse percentages

Reverse percentages are used when the percentage and the final number is given, and the original number needs to be found.

Q: A shop offers 30% off in a sale. The sale price of a pair of shoes is £84. Calculate the cost of the shoes before the sale.

£84 = 70% of the original amount.

$$\text{A: } \frac{84}{70} \times 100 = £120$$

$$\frac{\text{Value}}{\text{Equivalent percentage}} \times 100 = \text{Original amount}$$

Q: After a 4% wage rise, Bill earned £1248 each month. Calculate how much Bill earned each month before the wage rise.

$$\text{A: } \frac{1248}{104} \times 100 = £1200$$

£1248 = 104% of the original amount.

Direct and inverse proportion

Direct: Where both variables increase.

y is directly proportional to x, and when x=3 then y=15. Calculate y when x = 6.

$$y \propto x$$

$$y = kx$$

These are the general rules.

$$15 = k \times 3$$

$$5 = k$$

Sub in the values you know and complete the inverse to calculate k (15 ÷ 3 = 5).

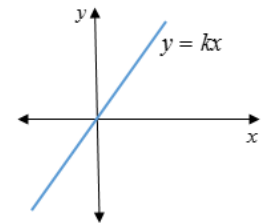
$$y = 5x$$

$$y = 5 \times 6 = 30$$

This is the formula for the given question.

$$y \propto x$$

$$y = kx \text{ for a constant } k$$



Inverse: Where one variable increases and the other decreases.

y is inversely proportional to x. When y=2, x=3. Work out the value of y when x = 12.

$$y \propto \frac{1}{x}$$

$$y = \frac{k}{x}$$

These are the general rules.

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

$$6 = k$$

Sub in the values you know and complete the inverse to calculate k (2 × 3 = 6).

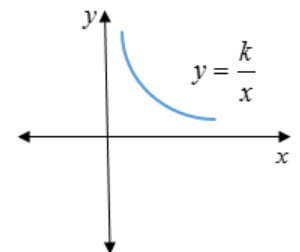
$$y = \frac{6}{x}$$

$$y = \frac{6}{12} = 0.5$$

This is the formula for the given question.

$$y \propto \frac{1}{x}$$

$$y = \frac{k}{x} \text{ for a constant } k$$

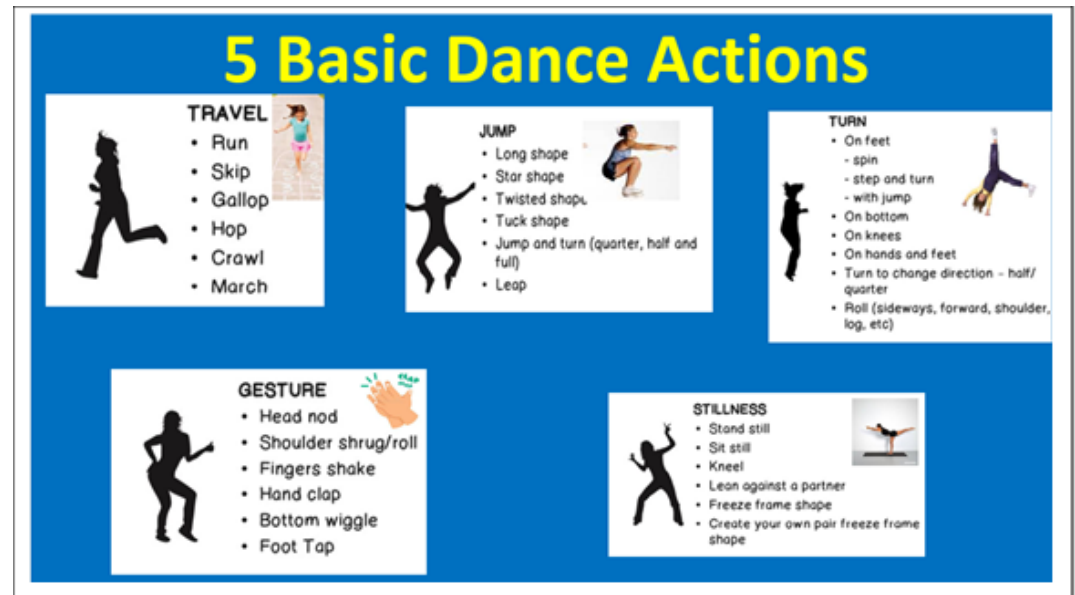


Y7 Dance Knowledge Organiser – Term 1

Health and Safety in Dance

In every dance lesson you must ensure that you adhere to all health and safety regulations. This includes wearing bare foot and warming yourself up correctly. All hair should be tied up and those students wearing a skirt must wear shorts.

When you develop your motif use the 5 basic Dance Actions to support you to work creatively.



Basic Skills

Dance lessons will teach you about music, rhythm and beat. You will also have a better understanding of spatial relationships, how to work collaboratively and start to develop your dance vocabulary.

What does RADS stand for?

Relationships, Actions, Dynamics and space

RELATIONSHIPS → WITH WHO

SOLO unison confrontational
close proximity duet
1 v 3 small groups
big groups distant canon
mirroring 2 v 2
face to face
cluster opposite side of stage

ACTION → WHAT

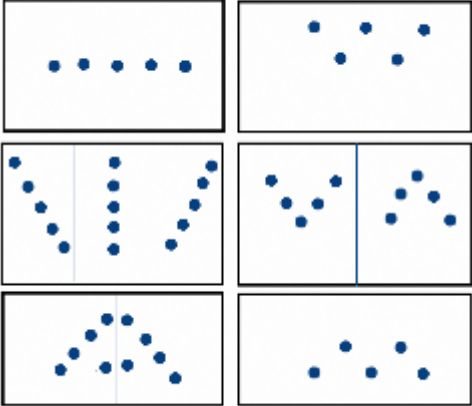
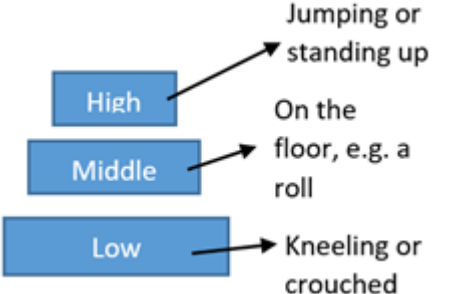
RUN ROLL STRETCH
LEAP
STILLNESS TWIST
CURL FALL HIDE
GESTURE TURN CARRY
WHEEL RISING SLIDE TWIST
HOP KICK REACH
RIPPLE WALK JUMP CROUCH

DYNAMICS → HOW

SHARP SLUGGISH
SUDDEN
FLOWING
FLUID PULSING
FORCED BOUND ABRUPT
SUSTAINED HEAVY
LETHARGIC SHODDY SILKY
VIOLENT GRACEFUL
SPORADIC SOFT ERRATIC
AGGRESSIVE PURPOSEFUL

SPACE → WHERE

OVER CIRCULAR
—LINEAR—
UNDER
CLOSED CLUSTER CLUSTER CLUSTER
OPEN PERSONAL SPACE
UP STAGE
DOWN STAGE FORMATIONS
EXTENDED HIGH
ISOLATED LOW

Choreographic Devices	Definition
Unison	Performing the same movement at the same time
Canon	Performing the same movement one after another
Formation	 <p>The position you stand in to perform</p>
Levels	 <p>The height at which you perform</p>
Repetition	When you repeat the same movement



Y7 Drama Knowledge Organiser – Term 1



Vocal Skills	Definitions
Pitch	How high or low you speak on stage to communicate character and emotions
Pace	Speaking fast or slow. The speed at which your character speaks.
Tone	Using your voice to show the audience how you feel. Using your voice to communicate expression
Volume	How loudly or quietly you speak on stage
Projection	How well the voice carries to the audience

Key Terms and Skills	Definition
Devising	Creating your own drama based on a stimulus. Instead of using a script, you create and write your own scenes.
Character Creation	Developing your own character considering their personal information, back story and physicality.
Narration	Where a character speaks directly to the audience tell them what is happening
Freeze frame	Creating a still image, thinking about facial expression and gestures that the audience can focus on.
Thought Tracking	g When a character talks directly to the audience to talk about how they are feeling (often combined with a freeze frames).

Physical Skills	Definitions
Facial Expressions	Using your face to show the thoughts, feelings and emotions of the character you are portraying/playing.
Body Language	Using your body to show the thoughts, feelings and emotions of the character you are portraying/playing.
Gestures	Using your hands to show the thoughts, feelings and emotions of the character you are portraying/playing
Levels	Using different levels in drama makes your performance visually more interesting. Using levels in drama helps to indicate your characters status.



Musicals

Musicals are theatrical productions that combine dialogue, music and dance to tell a story. In a musical, the plot is advanced through a combination of spoken dialogue, songs and choreography. They typically feature songs that advance the plot or develop characters as well as choreographed dance numbers. Musicals often include a range of musical styles and can vary from light hearted comedies dramatic productions. Musicals are performed on stage in theatres but can also be adapted into films and television productions. The musicals which we are looking at this term is Matilda and Oliver Twist.





Y8 Dance Knowledge Organisers Term 1

Health and Safety

In every dance lesson you must ensure that you adhere to all health and safety regulations. This includes bare feet and warming yourself up correctly. All hair should be tied up and those students wearing a skirt must wear shorts.

5 Basic Dance Actions

TRAVEL

- Run
- Skip
- Gallop
- Hop
- Crawl
- March

JUMP

- Long shape
- Star shape
- Twisted shape
- Tuck shape
- Jump and turn (quarter, half and full)
- Leap

TURN

- On feet
 - spin
 - step and turn
 - with jump
- On bottom
- On knees
- On hands and feet
- Turn to change direction - half/quarter
- Roll (sideways, forward, shoulder, leg, etc)

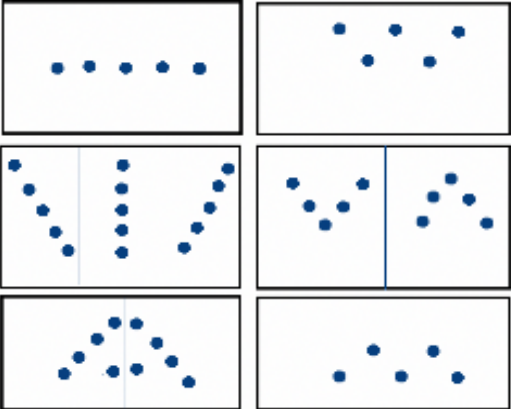
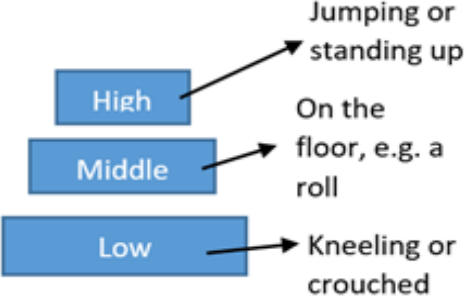
GESTURE

- Head nod
- Shoulder shrug/roll
- Fingers shake
- Hand clap
- Bottom wiggle
- Foot Tap

STILLNESS

- Stand still
- Sit still
- Kneel
- Lean against a partner
- Freeze frame shape
- Create your own pair freeze frame shape

When you develop your motif use the 5 basic Dance Actions to support you to work creatively.

Choreographic Devices	Definition
Unison	Performing the same movement at the same time
Canon	Performing the same movement one after another
Formation	 <p>The position you stand in to perform</p>
Levels	 <p>The height at which you perform</p>
Repetition	When you repeat the same movement

Mission Impossible

Mission impossible is about a group of secret agents who go on super exciting missions to save the world. The leader and his team use gadgets, wear disguises and come up with smart plans to stop the villains. Each mission is full of action and daring stunts.



Physical Theatre

Physical Theatre is a type of performance where physical movement is the primary method of storytelling; as opposed to, say, text in a play or music and lyrics in an opera. Also, it may incorporate other techniques such as mime, gesture and modern dance to create performance pieces.



Contact Work

Contact work in dance refers to a technique where dancers engage in physical interactions with each other, often through weight sharing and partnering. This emphasizes the use of the body contact to create dynamic movement, balance and support. It includes lifts, falls and other movements that rely on mutual trust and coordination. This is commonly used in contemporary and contract improvisation dance styles.



Music Knowledge Organiser

Year 7 Keyboard Skills

Keywords and Definitions

Pitch	How high or low a sound is.
Tune	A series of notes that make a melody.
Chord	Notes played together at the same time.
Rhythm	Long and short sounds combined to make a pattern.
Stave	The 5 lines we write music upon.
Treble Clef	A symbol at the start of a line of music, used for higher pitched instruments or the right hand of the keyboard.
Note Head	The round part of a music note.
Note stem	The stick part of a music note.
Bars	How music is divided into beats to make it easier to follow.
Barline	A way of dividing music into an equal number of beats to make it easier to follow.
Crotchet	A one beat note.
Quaver	A half beat note.
Crotchet Rest	A one beat silence.
Time Signature	A symbol like a fraction at the start of the music that helps musicians to count the beats.
Ledger Line	An addition to the stave. A small line to hang very high or very low notes upon.
Space Notes	The note head lives between two lines on the stave.
Line Notes	The line of the stave goes through the middle of the note head.
Sharp	The black note to the right of the named white note on the keyboard.
Flat	The black note to the left of the named white note on the keyboard.

Keyboard Layout

Black Notes - Sharps (#) and Flats (*b*)

Low pitch (Left)

High pitch (Right)



Black notes grouped in 2s and 3s.
C is at the start of the 2 black notes.

White Notes – Naturals

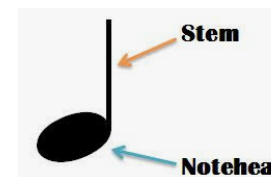
Keyboard Technique



The Stave



Music Notation Symbols



Treble Clef

Crotchet Note

Space Note

Quavers

Crotchet Rest

Double Barline



Time Signature

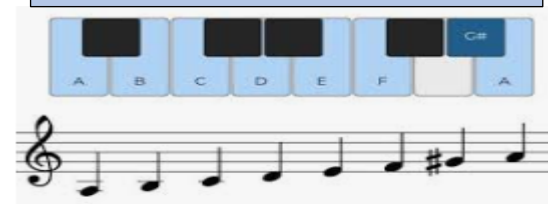
Barline

Line Note

Ledger Line



A Minor Scale



Music Knowledge Organiser

Year 8 Keyboard Skills

Keywords and Definitions

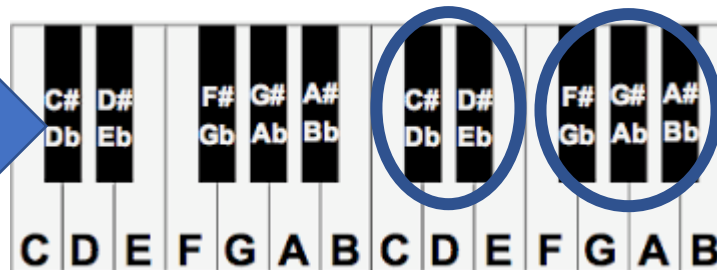
Ensemble	Performing music in a group.
Melody	The main tune of a piece of music.
Accompaniment	The part of the music that supports the main tune (e.g. chords, bass notes).
Major Chord	A happy sounding chord (e.g. C major – for which the chord symbol is C).
Minor Chord	A sad sounding chord (e.g. C minor – for which the chord symbol is Cm).
Diminished Chord	A scary sounding chord (e.g. C diminished – for which the chord symbol is C°).
Block Chords	Pressing the notes of the chord at the same time.
Broken Chords	Pressing the notes of the chord one after the other.
Chord Progression	A series of chords (e.g. C, Am, F, G).
Sequence	A feature of the melody. The melody is repeated but at a higher or lower pitch.
Repetition	A feature of the melody and accompaniment. Parts of the music are repeated exactly.
Conjunct	A feature of the melody. Notes move up and down in step.
Disjunct	A feature of the melody. Notes move up and down in leaps.
Scale	A list of notes that belong together from which we make a melody.
Scale Degrees	How we number the 8 notes of a scale.
Tempo	The speed of the music.
Sharp	The black note to the right of the named white note on the keyboard.
Flat	The black note to the left of the named white note on the keyboard.

Keyboard Layout

Black Notes - Sharps (#) and Flats (b)

Low pitch (Left)

High pitch (Right)



Black notes grouped in 2s and 3s.
C is at the start of the 2 black notes.

White Notes – Naturals

Chord Expressions

Major Chord
Expression (N)

N+4+3

Minor Chord
Expression (Nm)

N+3+4

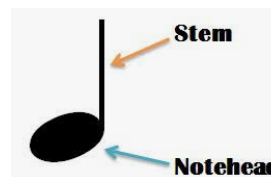
Diminished Chord
Expression (N°)

N+3+3

The Stave



Music Notation Symbols



Treble
Clef

Crotchet
Note

Space
Note

Quavers

Crotchet
Rest

Double
Barline



Time
Signature

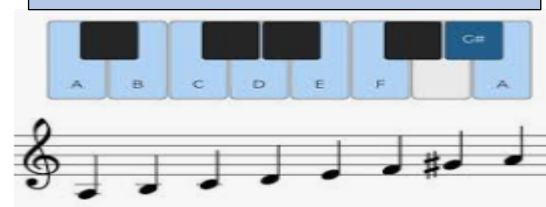
Barline

Line
Note

Ledger
Line



A Minor Scale



Music Knowledge Organiser
Year 9 Film Music

Keywords and Definitions	
Cliché	An overused or unoriginal idea. Features of film music that our brains expect to hear.
Device	A commonly used technique in music.
Motif	A short musical idea that can be developed throughout a piece of music.
Leitmotif	A short musical idea to represent a character in film.
Dread Motif (drone/pedal)	An idea that suggests dread. A long held, low pitch note.
Walking Motif (off beat chord)	An off-beat chord pattern to suggest movement of a character.
Falling & Rising Motif (Chromatic Scale)	Playing all of the notes within a certain range on the keyboard to create the feeling of falling or rising.
Tension Motif (diminished chord)	A diminished chord idea which evokes tension (e.g. C, Eb, Gb, A)
Dissonance	Notes that don't fit well together – often used in horror films.
Consonance	Notes that fit well together – often used in children's films.
Melody	The main tune of a piece of music.
Accompaniment	The part of the music that supports the main tune (e.g. chords, bass notes).
Major Chord	A happy sounding chord (e.g. C major – for which the chord symbol is C).
Minor Chord	A sad sounding chord (e.g. C minor – for which the chord symbol is Cm).
Diminished Chord	A scary sounding chord (e.g. C diminished – for which the chord symbol is C°).
Sharp	The black note to the right of the named white note on the keyboard.
Flat	The black note to the left of the named white note on the keyboard.

Keyboard Layout

Black Notes - Sharps (#) and Flats (b)

The Elements of Music

M Melody

the tune

A Articulation

how notes are played

D Dynamics

loud / soft and any other volume changes

T Texture

layers of sound and how they fit together

S Structure

sections of music and how they are organised

H Harmony

chords used

I Instruments

types of instruments heard

R Rhythm

the pattern of notes


T Tempo

the speed

Low pitch (Left) High pitch (Right)

Low pitch (Left) High pitch (Right)


Black notes grouped in 2s and 3s.
C is at the start of the 2 black notes.

White Notes – Naturals 


Example of a semitone
F to F#

The Stave

Music Notation Symbols





A diagram of a musical note. It consists of a vertical line (the stem) and a solid black oval (the notehead) at the bottom. An orange arrow points to the stem with the label "Stem". A blue arrow points to the notehead with the label "Notehead".



A diagram of a musical note. The note consists of a vertical line (stem) and a solid black oval (notehead). An orange arrow points to the stem with the label "Stem". A blue arrow points to the notehead with the label "Notehead".


**Treble
Clef**



Crotchet Note	Space Note
	

Line

Quavers Crotchet Double Barline
Rest



Double Barline

Double Barline

Time Signature



Barline


C Major Scale



E F G A B C

Ledger Line

A Minor Scale



The diagram illustrates the A minor scale. The top part shows a piano keyboard with the keys A, B, C, D, E, F, G, and A highlighted in blue. The key C# is also highlighted in blue. The bottom part shows a musical staff with the notes A, B, C, D, E, F, G, and A, with a sharp sign (#) indicating the F# note.

A Minor Scale

C Major Scale



C D E F G A B C

C Major Scale



C D E F G A B C

Judaism Knowledge Organiser

How it all began

Is there a God?

Who or what created the world and everything in it? Does science explain for us how the world began?

Am I an atheist – non believer?

Am I agnostic – Unsure if there is a God or not?

Am I a theist – do I believe that there is a God?

The Creation story

A story which can be found in the book of Genesis, which is the first book of the Bible. Jewish people may believe that the world and everything in it was created in 6 days and that this story should be taken literally or word for word. Other followers of Judaism may view this story as an allegory or a theory, meaning that it offers some explanation. Many Jewish people believe that science and religion can both explain how the world began.

The big bang theory

Many believe that a theory called the Big Bang Theory explains how the world began. But what caused the big bang? This leads to the causation argument, the idea that everything is caused by something.

Theory of evolution

Many people believe that the world and humans have evolved over a long period of time and there is no creator or God.

Important Jewish Prophets – Abraham

Abraham

Abraham is known as the founder of Judaism. He is a special prophet in Judaism and shared a special bond with God, through the covenants or special promises and agreements made between him and God. Abraham's faith in God was tested on several occasions. He was asked to leave his homeland and move to a place in the desert which brought many challenges. Abraham and his wife Sarah could not have children of their own, but God promised that they one day would. After proving his faith in God, Abraham and his wife were blessed with their son Isaac. After a few years, God gave one final test of faith to Abraham and asked him to sacrifice his son.

Important Jewish Prophets – Moses

Moses

Moses was chosen by God to deliver the Hebrews from slavery in Egypt. Moses was sent by his mother in a basket down the River Nile where he was discovered by the Pharaohs family. He was brought up as an Egyptian prince but then went on to discover that he was in fact a Hebrew himself. God gave Moses the task of freeing the Hebrews from Egypt. God helped Moses achieve this by sending the 'Ten plagues' the final one, the angel of death or Passover assured the freedom of the Hebrews. God then tasked Moses with delivering his Ten Commandments to the Hebrew people in the promised land.

Judaism –Key facts

The religion of Judaism is over 4000 years old. It is one of the oldest documented religions in the world. It is known as one of the "Abrahamic" religions along with Christianity and Islam.

Passover

This special festival is celebrated in springtime by Jewish people. Jewish communities and families gather to remember their freedom from slavery in Egypt. The festival can last 7-8 days and on the first evening of Passover, families celebrate together with a special meal called the Seder meal. Stories are shared and prayers are said throughout the evening as well as the sharing of the Seder meal, which is a plate of symbolic food which reminds the Jewish people of the events of the evening that they were released into freedom.

Shabbat

Shabbat or Sabbath is the weekly ritual where Jewish families have a day of rest. This is to recognise that God rested on the seventh day of creation, and it is also one of the ten commandments, so Jewish people are required to do this. Shabbat begins at sunset on the Friday evening and lasts until sunset on Saturday evening. Jewish people can not do any work during this time, so all preparations have to be in place before sunset on Friday. Families will gather for a meal and prayers, where they will perform rituals such as Kiddush and the mother of the family will welcome Shabbat into the home. On the Saturday, the family will visit the Synagogue where they will pray together with the community. Shabbat will end on Saturday evening with the Havdalah ceremony to officially end Shabbat, until the following week.

Bar and Bat Mitzvah

These are two Jewish rituals which indicate that a boy or girl is now old enough to take responsibility for their own religious practice and participation in the Jewish faith. A girl will have the Bat Mitzvah ceremony when she is around 12 years old. A boy will have this ceremony when he is around 13 years old. It is celebrated at the Synagogue with the family and usually followed by a party to celebrate this milestone or rite of passage in the young persons life.

Year 8 Islam - Knowledge Organiser

What is Islam?

Islam is the 2nd largest religion in the world with over one billion followers.
Islam was revealed to the prophet Muhammad over 1400 years ago, in Mecca in the Middle East.
There are around 2 million Muslims living in the United Kingdom

What will we study?

In this unit we will focus on

- Where did Islam originate and beginnings?
- The Prophet Muhammad (pbuh)
- The five pillars of Islam
- Shahadah and Salah
- Sawm (Ramadan)
- Hajj (Pilgrimage)
- Islamophobia

What is Islam?

We will identify and explore what Islam means and when and how Islam originated.
We will examine the key aspects of Islam, for example when and where it originated, how Muslims (followers of Islam) live their daily lives, along with where Muslims go to pray and what important sacred books and teachings they follow. We will also identify what types of festivals or acts of worship that Muslims take part in.

Muhammad

We will learn about the prophet Muhammad and how his special relationship with Allah (God) enabled Islam to gain so many followers. We will look at the courage and strength that Muhammad showed when devoting his life to and being faithful to God. We will also learn about what Muslims today, think about Muhammad.

Shahada and Salah

Shahada and Salah are the ways that Muslims show God that they respect him through prayer and acts of devotion. They are the first and second pillars of Islam.

Hajj

Hajj is the fifth pillar of Islam. Hajj is the pilgrimage to Mecca (where Muhammad was born) and all Muslims are expected to attend the annual pilgrimage at least once in their lifetime. Muslims will perform a series of events which reflect the life of Muhammad and the arrival of Islam as a world religion.

Islamophobia

Islamophobia is a term used to describe a fear of Muslims. Since 9/11 there has been an increase of suspicious beliefs about Muslims and the religion of Islam. Due to media reports and television reports linking Islam to terrorism, many people now have a hostile view of Islam. We will look at how these views impact Muslims and address many misconceptions about the religion of Islam

Five Pillars of Islam

The five pillars of Islam are five expectations which Muslims have to perform in their daily lives. These consist of

- Shahadah – Declaration of faith
- Salah – Daily prayers and devotion to Allah
- Zakah – The act of giving to charity
- Sawm – Fasting during the month of Ramadan
- Hajj – Pilgrimage to Mecca

Sawm – Ramadan

Sawm is the 4th pillar of Islam. During the month of Ramadan Muslims are expected to fast during daylight hours and devote themselves to their faith entirely, for a whole month.

Year 9 Ethics - Knowledge Organiser

What is Ethics ?

Ethics is a system of moral principles. They affect how people make decisions and lead their lives.

- how to live a good life
- our rights and responsibilities
- the language of right and wrong
- moral decisions - what is good and bad?

What are ethical issues

In this unit we will focus on the topics of

- Introduction to ethics
- Organ donation
- Euthanasia
- Treatment and experimentation of animals
- Abortion (pro life – pro choice)
- Death penalty

Lesson 1 – What is Ethics

We will identify and explore where we get our judgements and ideas from.

Why is it important to respect others views?

We will focus on why it is important to do the right thing in any given situation, using our morals as a compass or guide for doing so.

How does ethics help the society and world in which we live?

What do religious people say in ethical situations? How influential is their holy book and religious teachings when making challenging decisions in ethical situations.

Organ Donation

We will explore whether it is ethical to donate organs from one human body to another whether the person is deceased or alive. We will identify what a Christian approach to the topic is. Do any Christians support the idea of organ donation? Are there any religious people who do not support organ donation? What might the issues be surrounding organ donation?

Euthanasia

Euthanasia is also known as mercy killing. It is the action of somebody ending their life in a painless way which has been arranged by themselves, if they are suffering a terminal or lifelong debilitating illness. We will look at the law surrounding Euthanasia and decide if it is ever right to perform this action. What do religious people say about the issue? Is it sanctity of life over quality of life? We will look at hospice care as an alternative to end of life

Treatment of animals

Focusing on the story of Genesis and the instructions given as to how humans should care for God's creation. We will focus on whether we are doing our job correctly, exploring issues around it is right to experiment on animals for any reason (medical, cosmetic?) Should we be eating animals, or is there a fair way to consume meat? How do we treat animals in daily life? Should we be using animals for entertainment purposes?

Abortion (Pro life or Pro choice?)

We will explore the laws and history of abortion as well as several religious teachings surrounding the situation. We will look at arguments both for and against abortion and is it the right of the woman to choose what to do with her body? What about the sanctity of life, where on God decides when life begins and ends.

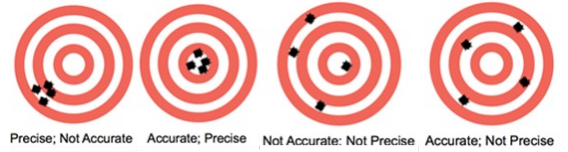
The death penalty

The death penalty has been around since civilisation began, but is it ever right? In this topic we will focus on a brief history of the death penalty and why it was used. We will also explore where the death penalty is still a method of punishment in our 21st century world? We will consider religious teachings surrounding this topic and will look at how the death penalty impacts the perpetrator as well as the victim.

Working Scientifically

Keyword	Definition
Independent variable	The factor that is changed during an investigation.
Dependent variable	A value you measure if you change the independent variable.
Control Variable	Factors that you keep the same – they could affect the results so need to be monitored.
Hypothesis	A proposal intended to explain observations or facts.
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Anomalies	A result that does not fit the data set or trend.
Accuracy	How close values are to the actual value.
Precision	How close the values are to each other.

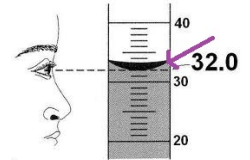
Accuracy vs Precision



Measuring Accurately



Electronic balance for measuring mass



Measuring at eye level using the meniscus

Calculations

$$\text{Mean} = \frac{\text{Sum of All Data Points}}{\text{Number of Data Points}}$$

If there is an anomaly, make sure you do not include it in the calculations

Risk Assessment

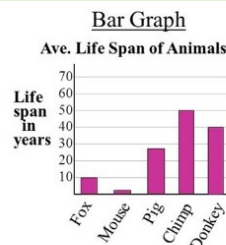
Hazard	Risk	Control
The object or process that could cause harm	The injury – what could hurt or damage you	What you should do in order to avoid the risk
Example: Bunsen Burner	Example: Hair burning	Example: Tie long hair back

Graphs – TOP TIPS

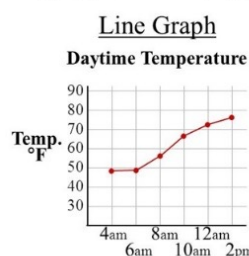
Y-axis
Dependent variable

X-axis
Independent variable

Categoric values for bar graphs



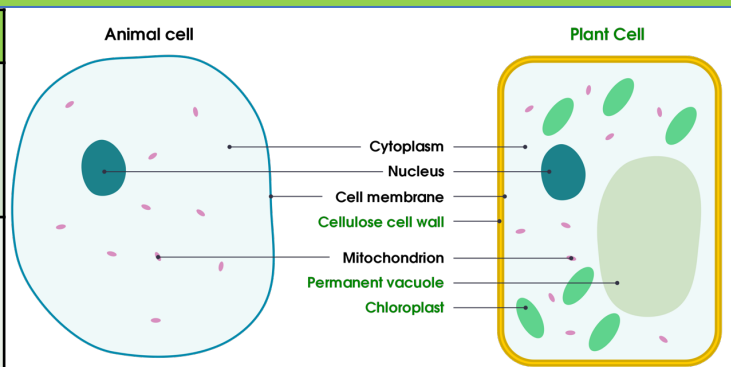
Continuous values for line graphs



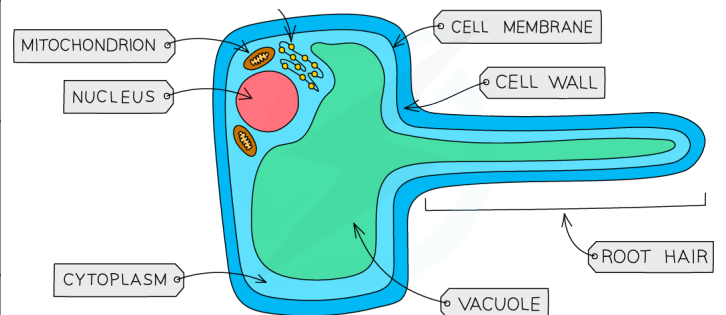
- Choose good scales with the dependent variable on the y-axis.
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- Draw a line of best fit using a ruler for a straight-line graph.
- Draw free hand for a curved graph.
- Check and circle anomalies.

Y7 Biology – Cells

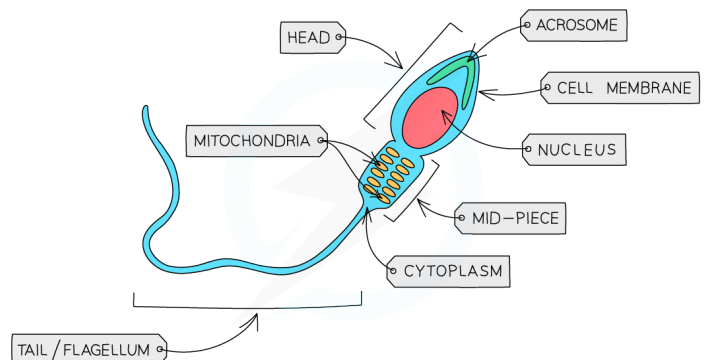
Keyword	Definition
Resolution	The ability to show detail. The higher the resolution, the less blurry the cell.
Prokaryotes	These cells do not contain membrane bound organelles or a nucleus.
Eukaryotes - e.g., plant and animal cells.	They contain membrane bound organelles like nucleus and mitochondria.
Adaptation	Special feature to help a cell carry out its function.
Cell Membrane	Controls the movement of substances in and out of the cell.
Nucleus	Controls the cells activities, contains DNA.
Vacuole	Contains cell sap. Keeps the cell turgid.
Mitochondria	Releases energy through respiration.
Cell Wall	Supports the cell. Made of Cellulose.
Chloroplast	Absorbs light for photosynthesis.
Cytoplasm	Chemical reactions occur here, e.g. anaerobic respiration.
Diffusion	The movement of particles from an area of high concentration to an area of low concentration.



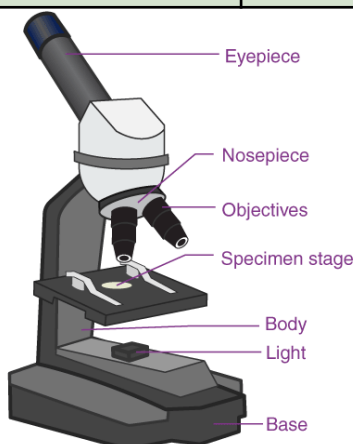
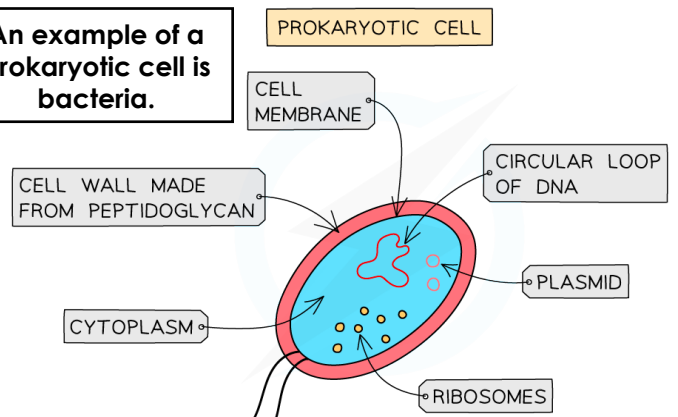
Root Hair Cell
A specialised plant cell, adapted to it's function.



Sperm Cell
A specialised animal cell, adapted to it's function.



An example of a prokaryotic cell is bacteria.



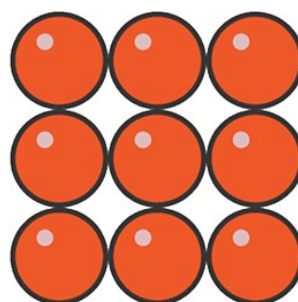
Microscopes & calculating magnification

$$\text{Magnification} = \frac{\text{image size}}{\text{actual size}}$$

Y7 Chemistry – Particle Model

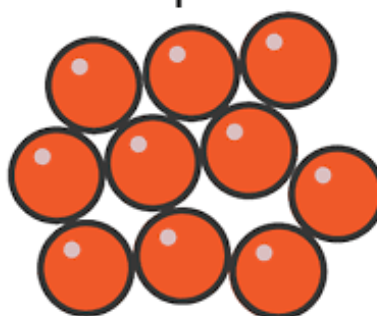
Keywords	Definition
Particle	A very tiny object such as an atom or molecule, too small to be seen with a microscope.
Diffusion	Particles of gas or liquid that spread out randomly from an area of high concentration to an area of low concentration.
Evaporate	Change from a liquid to a gas at the surface of a liquid at any temperature.
Boil	Change of state from a liquid to a gas of the total liquid when the temperature rises to its boiling point.
Condense	Change of state from a gas to a liquid when the temperature drops to the boiling point.
Melt	Change of state from a solid to a liquid when the temperature rises to the melting point.
Freeze	Change of state when a liquid becomes a solid when the temperature drops to the melting point.
Sublime	Change of state when a solid changes directly into a gas.

Solid



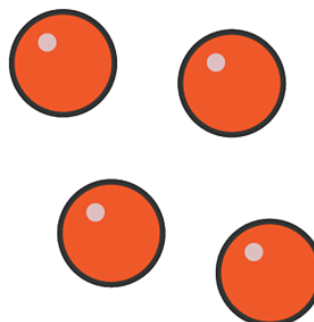
Solids have a regular arrangement and the particles vibrate on a fixed point.

Liquid

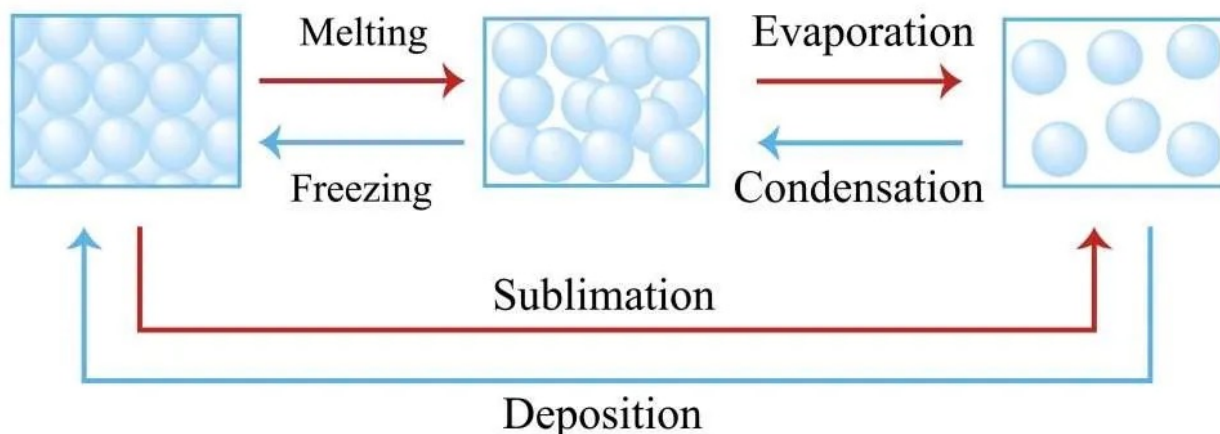


Liquids have an irregular arrangement and the particles move around but they are still bonded together.

Gas



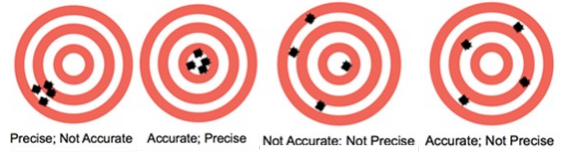
Gases have an irregular arrangement, they have high energy and are not bonded together.



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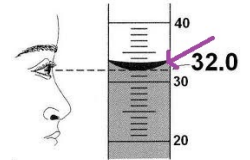
Accuracy vs Precision



Measuring Accurately



Electronic balance for measuring mass



Measuring at eye level using the meniscus

Calculations

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If there is an anomaly, make sure you do not include it in the calculations

Risk Assessment

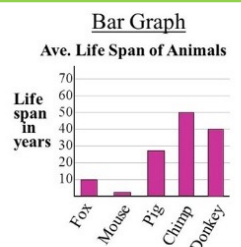
Hazard	Risk	Control
The object or process that could cause harm	The injury – what could hurt or damage you	What you should do in order to avoid the risk
Example: Bunsen Burner	Example: Hair burning	Example: Tie long hair back

Graphs – TOP TIPS

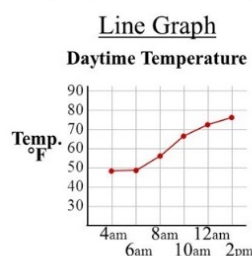
Y-axis
Dependent variable

X-axis
Independent variable

Categoric values for bar graphs



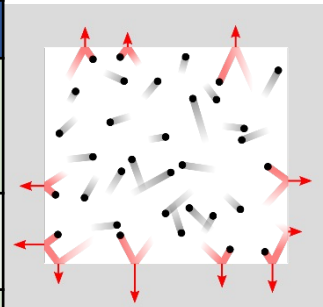
Continuous values for line graphs



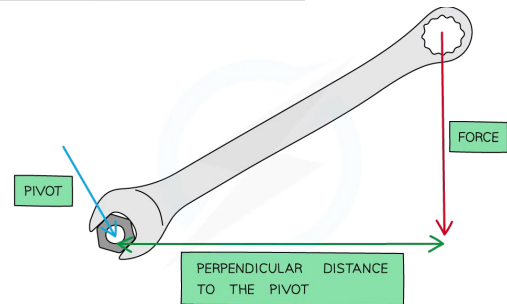
- Choose good scales with the dependent variable on the y-axis.
- Plot the points carefully using an 'x'.
- Draw a line of best fit using a ruler for a straight-line graph.
- Draw free hand for a curved graph.
- Check and circle anomalies.

Y8 Physics – Pressure and Moments

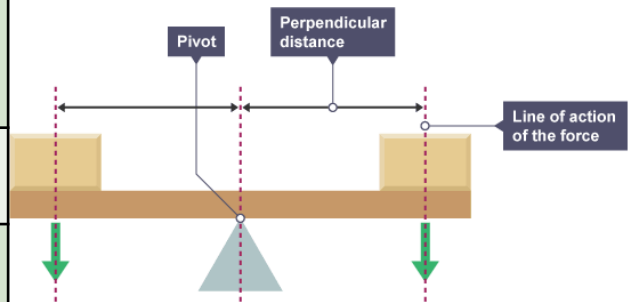
Keyword	Definition
Atmospheric Pressure	The pressure caused by the weight of the air acting on the surface.
Fluid	A substance that can flow, a gas or a liquid.
Moment	The turning effect of a force acting on an object.
Pressure	$\text{Pressure} = \text{Force} \div \text{Area}$
Density	The mass of a substance in a certain volume.
Force	An interaction that can change the shape or the motion of an object.
Pivot	A fixed point that a simple machine balances or turns.
Weight	The force due to gravity acting on an object.
Molecules	A group of atoms bonded together.
Gas	A state of matter with no fixed shape and no fixed volume.



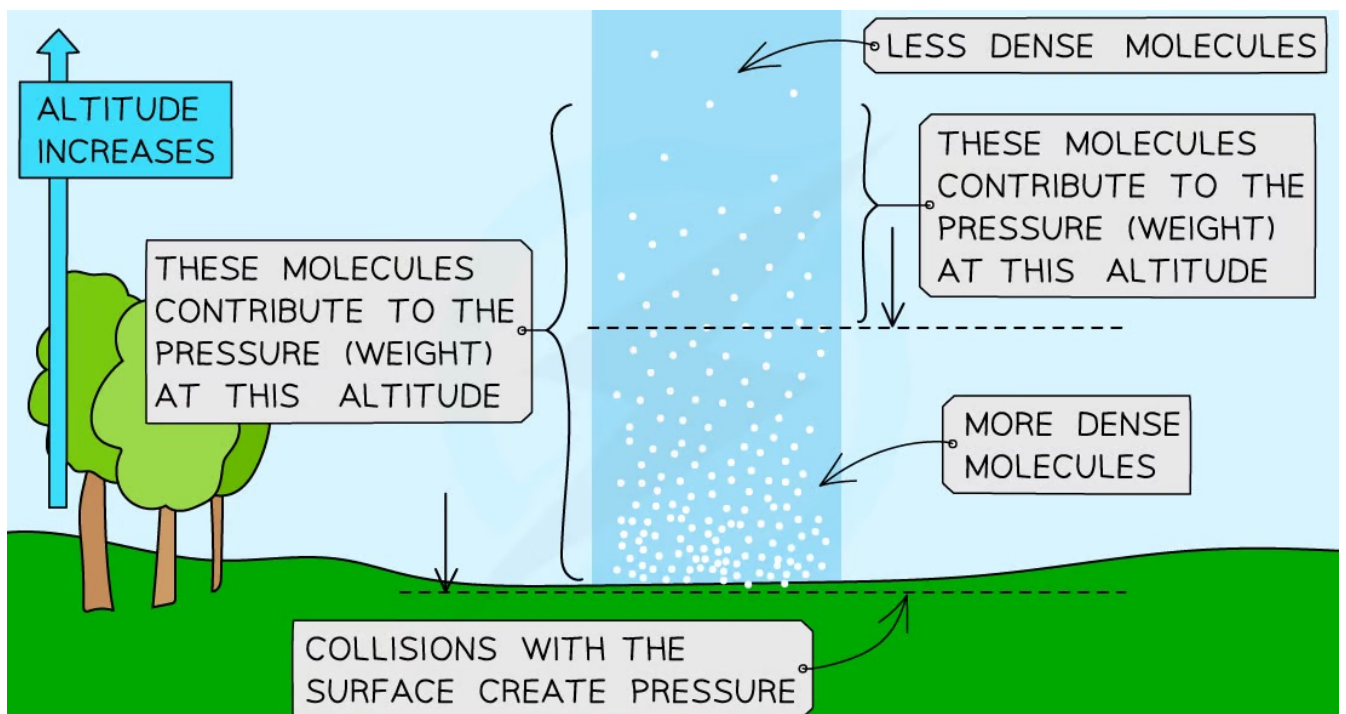
Particles collide with each other and the walls, this exerts a force and causes gas pressure.



A simple machine increases the effect of a force.



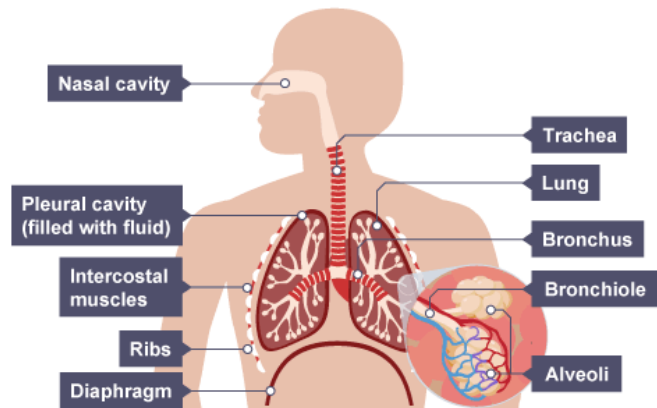
A moment will cause the object to turn about a pivot.



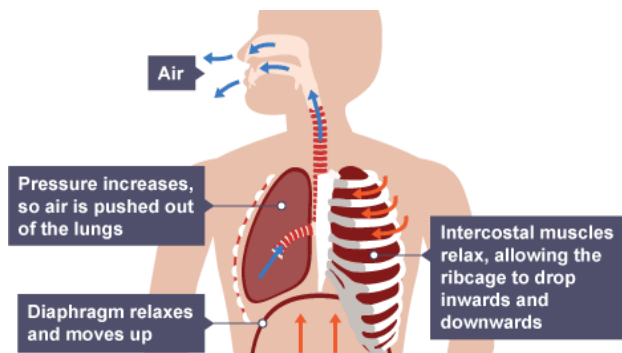
Y8 Biology – Breathing

Keyword	Definition
Breathing	The movement of air in and out of the lungs.
Trachea	Carries air from the mouth and nose to the lungs.
Bronchi	Two tubes which carry air to the lungs.
Bronchioles	Small tubes in the lung.
Alveoli	Small air sacs found at the end of each bronchiole. Gas exchange takes place between here and the blood.
Ribs	Bones which surround the lungs to form the ribcage
Diaphragm	A sheet of muscle found underneath the lungs.
Lung	Soft organ that inflates to draw in oxygenated air and deflates to expel air.

The Parts of the Human Body used for Breathing



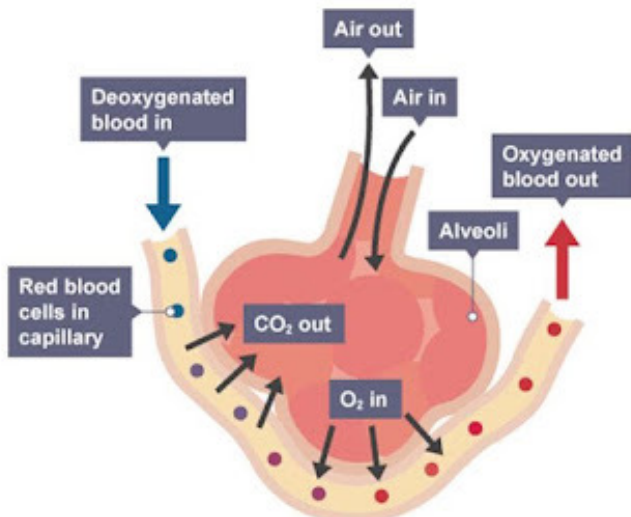
How is Air Moved into and out of the Lungs?



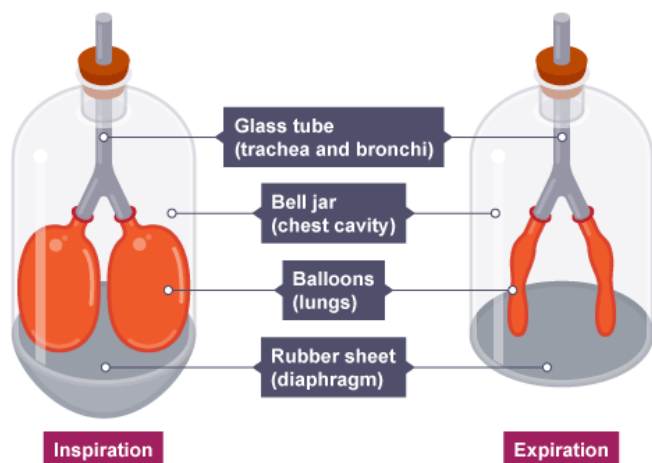
Pressure is the amount of force that is being applied to the surface area of the lungs.

$$\text{Pressure} = \text{Force} \div \text{Area}$$

Gas Exchange in the Lungs



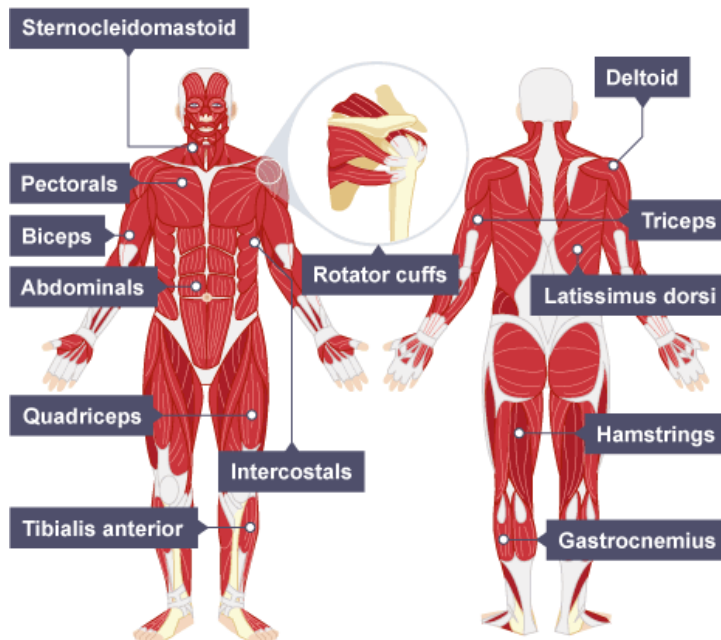
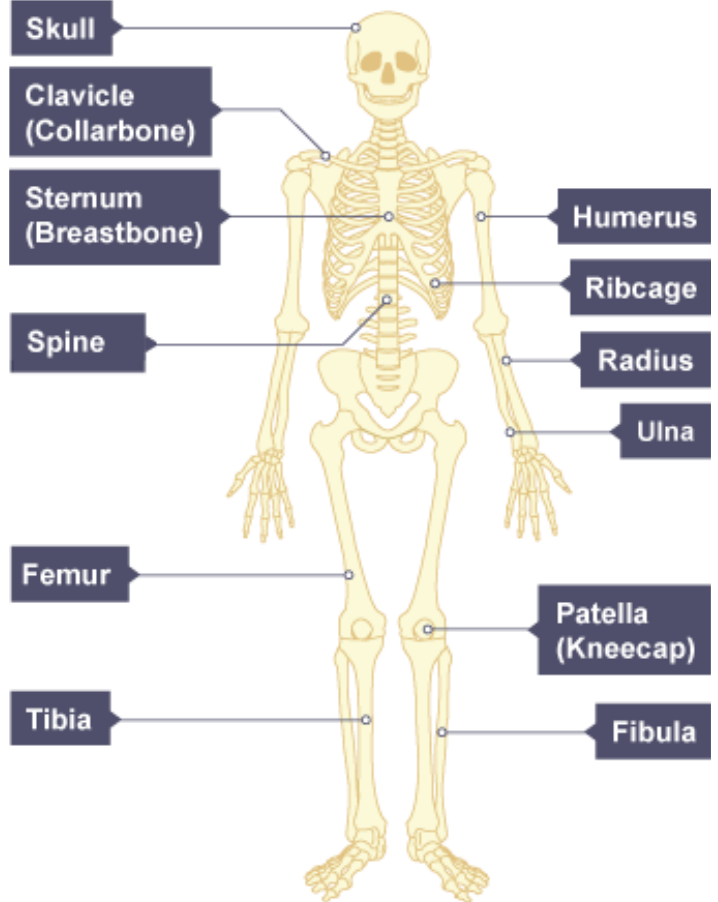
Modelling the Process of Breathing



Y9 Biology – Skeletal & Muscular System

Keyword	Definition
Joints	Places where bones meet.
Bone marrow	Tissue found inside some bones where new blood cells are made.
Ligaments	Connect bone to bone in joints.
Tendons	Connect muscles to bones.
Cartilage	Smooth tissue found at the end of bones, which reduces friction between them.
Antagonistic pairs	Muscles working in unison to create movement.
Moment	The turning effect of a force about a pivot. These are delivered by muscles.

Human Skeletal System



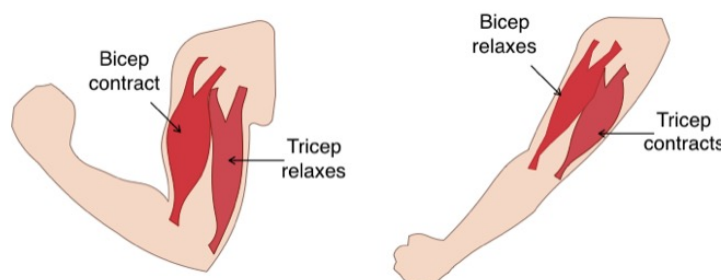
The Human Muscular System

Humans use their muscles to allow them to move.

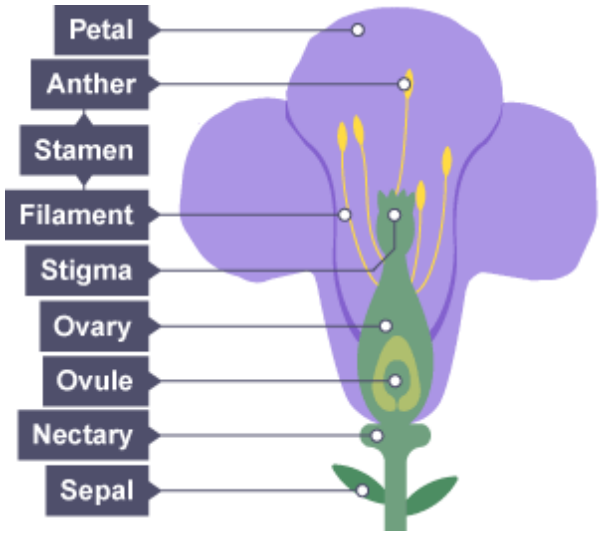
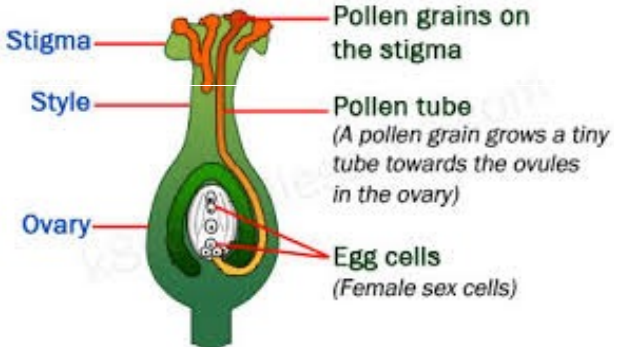
The contract and extent to move the bones at a joint e.g. the elbow.

Antagonistic Pair of Muscle.

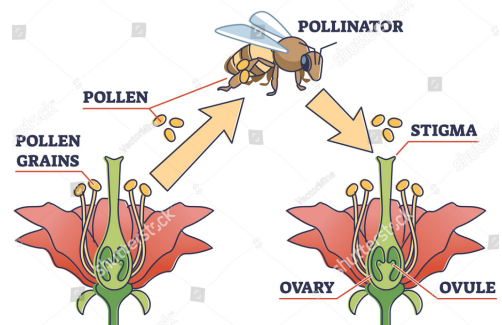
To bend the elbow, the biceps contract to move the arm, acting as the agonist. The triceps relax to allow the movement, so act as the antagonist.



Y9 Biology – Plant Reproduction

Keyword	Definition	The Parts of a Plant
Pollen	Contains the plant male sex cells found on the stamens.	
Ovules	Female sex cells in plants found in the ovary.	
Pollination	Transfer of pollen from the male part of the flower to the female part of the flower.	
Fertilisation	Fusing of male and female nuclei from sex cells.	
Seed	Structure that contains the embryo of a new plant.	The Plant Reproductive System 
Fruit	Structure that the ovary becomes after fertilisation, which contains seeds.	
Carpel	The female part of the flower, made up of the stigma where the pollen lands, style and ovary.	
Stamen	The male part of the flower which is made up of the filament and the anther.	

POLLINATION



Feature	Insect-pollinated	Wind-pollinated
Position of stamens	Enclosed within the flower so insects must make contact	Exposed so that wind can easily blow pollen away
Position of stigma	Enclosed	Exposed
Type of stigma	Sticky, so that pollen attaches to insects	Feathery, to catch pollen blown from wind
Colour of petals	Brightly coloured to attract insects	Dull, usually green
Nectaries	Present as reward for insects	Absent
Pollen grains	Larger, sticky	Smaller, smooth, inflated

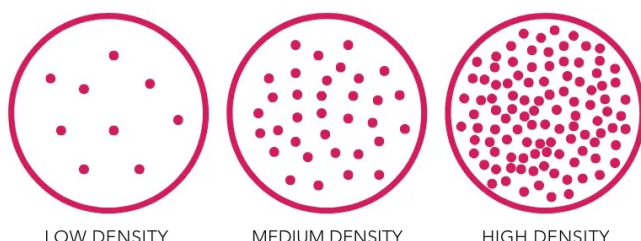
Y9 Chemistry – Particle Model

Keywords	Definition
Particle	A very tiny object such as an atom or molecule, too small to be seen with a microscope.
Evaporate	Change from a liquid to a gas at the surface of a liquid at any temperature.
Boil	Change of state from a liquid to a gas of the total liquid when the temperature rises to its boiling point.
Condense	Change of state from a gas to a liquid when the temperature drops to the boiling point.
Melt	Change of state from a solid to a liquid when the temperature rises to the melting point.
Freeze	Change of state when a liquid becomes a solid when the temperature drops to the melting point.
Sublime	Change of state when a solid changes directly into a gas.
Density	The density of a substance tells us how many particles there are in a given volume.

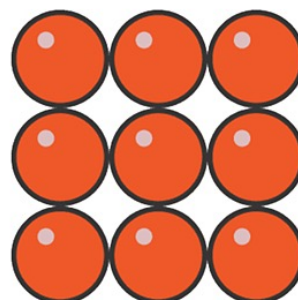
Density of Different Substances

The **higher** the **density**, the **more particles** there are in a certain **volume**.

The **lower** the **density**, the **less particles** there are in a certain **volume**.

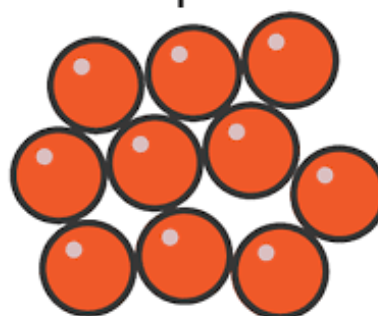


Solid



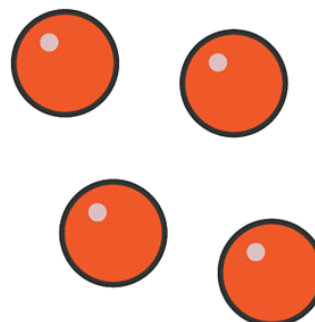
Solids have a regular arrangement, and the particles vibrate on a fixed point.

Liquid



Liquids have an irregular arrangement, and the particles move around but they are still bonded together.

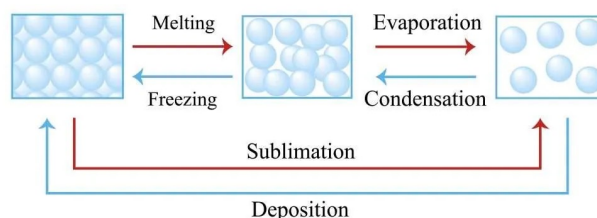
Gas



Gases have an irregular arrangement; they have high energy and are not bonded together.

Changing States

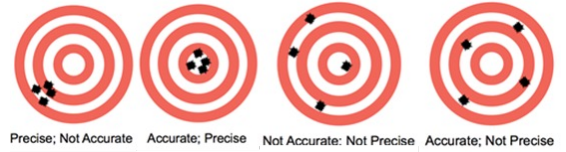
As a substance changes state the internal energy of the substance changes,



Working Scientifically

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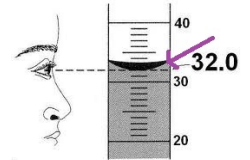
Accuracy vs Precision



Measuring Accurately



Electronic balance for measuring mass



Measuring at eye level using the meniscus

Calculations

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Risk Assessment

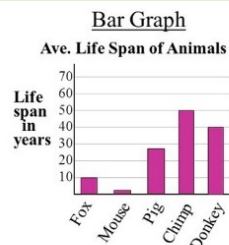
Hazard	Risk	Control
The object or process that could cause harm	The injury – what could hurt or damage you	What you should do in order to avoid the risk
Example: Bunsen Burner	Example: Hair burning	Example: Tie long hair back

Graphs – TOP TIPS

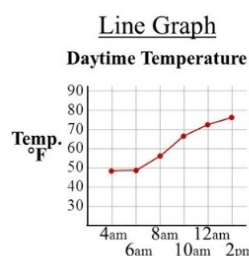
Y-axis
Dependent variable

X-axis
Independent variable

Categoric values for bar graphs



Continuous values for line graphs

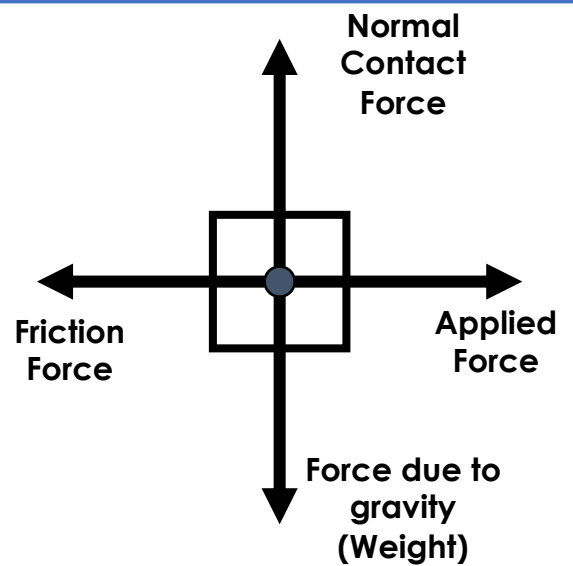


- Choose good scales with the dependent variable on the y-axis.
- Plot the points carefully using an 'x'.
- Draw a line of best fit using a ruler for a straight-line graph.
- Draw free hand for a curved graph.
- Check and circle anomalies.

Y9 – Physics – Forces

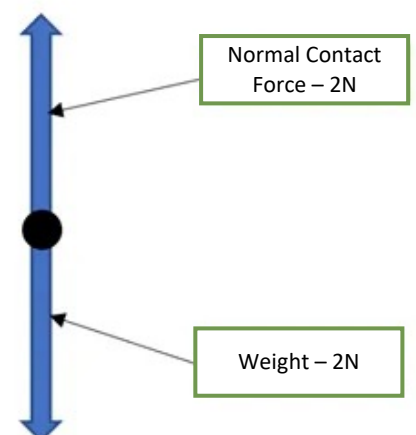
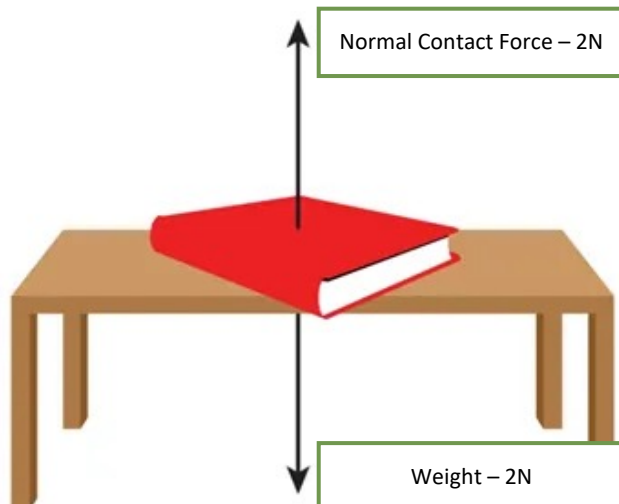
Keyword	Definition
Force	Something that changes the shape, speed or direction of an object.
Contact Force	A force that must be touching another object to have an effect.
Non - Contact Force	A force that does not have to be touching another object to have an effect.
Friction	An opposing force caused by the interaction of solid surfaces when they move over one another.
Drag	Also called air resistance, it is an opposing force between solid and fluid substances.
Weight	The non-contact force that pulls objects towards the Earth.
Normal contact	Is the contact, reaction force of the ground.
Magnetism	A non-contact force of attraction or repulsion that arises between magnetic objects.
Tension	A force developed in a rope, string, or cable when stretched under an applied force.
Thrust	A mechanical force that pushes an object forward.

Force Diagrams



The Rules of Force Diagrams:

- 1) Start with a basic shape.
- 2) Draw a dot at the centre (this is the centre of mass).
- 3) Represent the forces as arrows (the length of the arrow shows the size, and the arrow shows the direction).



01

¡Hola!	Hello!
¡Buenos días!	Good morning!
¡Buenas tardes!	Good afternoon!
¿Cómo te llamas?	What is your name?
Me llamo...	I am called...
Mi nombre es...	My name is...
*Mi apellido es...	*My surname is...
¿De dónde eres?	Where are you from?
Soy de Inglaterra	I am from England.
¿Y tú?	And you?
¡Adiós!	Bye!

02

¿Cómo estás?	How are you?
¿Qué tal?	What's up?
Estoy (muy) bien	I am (very) well
Estoy regular	I am ok
Estoy mal	I feel bad
Estoy fatal	I am terrible
Estoy cansado	I am tired

03

¿Cuántos años tienes?	How old are you?
Tengo <u>doce</u> años	I am twelve years old
¿Cuándo es tu cumpleaños?	When is your birthday?
Mi cumpleaños es el... de...	My birthday is the... of...
Tiene ____ años	He/ she is _____ years old.

LOS MESES

enero	January
febrero	February
marzo	March
abril	April
mayo	May
junio	June
julio	July
agosto	August
septiembre	September
octubre	October
noviembre	November
diciembre	December

04

ESPAÑOL
YEAR 7
1 Yo en
Hollywood

LOS NÚMEROS

uno	one
dos	two
tres	three
cuatro	four
cinco	five
seis	six
siete	seven
ocho	eight
nueve	nine
diez	ten
once	eleven
doce	twelve
trece	thirteen
catorce	fourteen
quince	fifteen
dieciséis	sixteen
diecisiete	seventeen
dieciocho	eighteen
diecinueve	nineteen
veinte	twenty
veintiuno	twenty one
veintidós	twenty two
veintitrés	twenty three
veinticuatro	twenty four
veinticinco	twenty five
treinta	thirty
treinta y uno	thirty one

05

07

LOS COLORES

amarillo	yellow
azul	blue
blanco	white
gris	grey
marrón	brown
morado	purple
naranja	orange
negro	black
rojo	red
rosa	pink
verde	green

EN CLASE

09

No entiendo	I don't understand
Necesito ayuda	I need help
No tengo	I don't have
Un bolígrafo	A pen
Mi cuaderno	My book
Una goma	An eraser
Un lápiz	A pencil
Una regla	A ruler
Un sacapuntas	A sharpener

CONJUNCIONES

10

y	and
o	or
pero	but
también	also
sin embargo	however

DÍAS
DE LA
SEMANA

lunes	Monday
martes	Tuesday
miércoles	Wednesday
jueves	Thursday
viernes	Friday
sábado	Saturday
domingo	Sunday

06

MIS PREFERENCIAS

08

Me encanta	I love
Me gusta mucho	I really like
Me gusta	I like
Prefiero	I prefer
No me gusta	I don't like
No me gusta nada	I don't like at all
Odio	I hate
Mi color preferido es el	My favourite colour is

REVISION TIME

Spanish- English
FlashcardsSay the
words aloudcover the
English meaningsWrite down
the wordsCheck your
spellings

Year 8- Español

SITIOS EN MI CIUDAD- Places in my town

una calle	street
un banco	a bank
una escuela	a school
una universidad	a university
un cine	a cinema
una estación de tren	a train station
un estadio	a stadium
un hospital	a hospital
un hotel	a hotel
una iglesia	a church
un instituto	a school
una mezquita	a mosque
un museo	a museum
un parque	a park
una plaza de toros	a bullring
un restaurante	a restaurant
un mercado	a supermarket
una tienda de ropa	a clothes shop



Important verbs- Present tense

En mi ciudad hay	In my city there is
Mi ciudad tiene	My city has
Se puede	You can

DESCRIBING PLACES

bonito	beautiful
feo	ugly
histórico	historical
tranquilo	quiet
nuevo	new
moderno	modern
antiguo	old-fashioned
industrial	industrial

HAY MUCHO QUE HACER
There is lots to fo

bailar	dance
ir a un concierto	go to a concert
ir al cine	go to the cinema
ir de compras	go shopping
practicar deporte	do sports
salir con amigos	go out with friends
pasear	go for a walk
visitar el museo	visit the museum
viajar en tren	travel by train



A city break- using the past tense



Past time phrases

El fin de semana pasado	Last weekend
La semana pasada	Last week
El mes pasado	Last month
El año pasado	Last year
Hace dos veranos	Two Summers ago
Hace tres meses	Three months ago

Sequencing connectives

Primero	First
Después	After
Finalmente	Finally
Sin embargo,	However,
Aunque	Although
Ya que/ dado que	Because

Activities in the past

Fui	I went
Fuimos	We went
Fue	It was
Nadé en el mar	I swam in the sea
Visité	I visited
Compré recuerdos	I bought souvenirs
Saqué fotos	I took pictures
Viajé en tren	I travelled by train
Comí	I ate
Comimos	We ate

Revision time!



Quizlet



Spanish- English
Flashcards



Say the
words aloud



Cover the
English meanings



Write down
the words



Check your
spelling

Mi familia

Mis padres	My parents
Mi madrastra	My stepmother
Mi padrastro	My stepdad
Mis hermanos	My siblings
Mayor	Older
Menor	Younger
Mi hermanastro	My stepbrother
Mi hermanastra	My stepsister
Mis abuelos	My grandparents
Mis tíos	My uncle and auntie
Mis primos	My cousins
Mi novio	My boyfriend
Mi novia	My girlfriend
Pareja	Couple
*Hijo único	*Only child (boy)
*Hija única	*Only child (girl)
*Marido	*Husband
*Mujer	*Wife
*Nieto	*Grandson
*Nieta	*Granddaughter
*Parientes	*Relatives
*Compañero	*Friend/ mate

Verbos importantes

Es	He/ she is
Son	They are
Se llama	He/ she is called
Tiene	He/ she has
Tengo buena relación con	I have a good relationship with
*Discuto con	*I argue with
*Me llevo bien con	*I get on well with
*Solemos (+ infinitive)	*We usually (+ infinitive)

Año
Español

MIS RELACIONES

Describiendo a mi familia

Joven	Young
Divertido	Funny
Aburrido	Boring
Estricto	Strict
Molesto	Annoying
Hablador	Talkative
Serio	Serious
Amable	Kind
Simpático	Nice
Antipático	Unkind, rude
*Comprensivo	*Understanding
*Egoísta	*Selfish
*Cariñoso	*Loving

Cuantificadores

Demasiado	Too
Muy	Very
Bastante	Quite
Un poco	A little
Nada	Not at all
Realmente	Really

Opiniones

Lo bueno es que
Lo malo es que
*Diría que
*Mi amigo dice que
*Me hace reír
*No me dejan salir
*Me comprende

The good thing is that
The bad thing is that
*I would say that
My friend says that
*He/she makes me
*They don't let me go out
*He/she understands me



Tiempo en familia

Fuimos	We went
Comimos	We ate
Bebimos	We drank
Visitamos	We visited
Celebramos	We celebrated
Fue	It was
*Discutíamos	We used to argue
*Me llevaba bien con	*I used to get on well with
*Vimos una película	*We watched a movie
*Era	He/she used to be
*Solía (+ infinitive)	I used to (+ infinitive)

Mi familia ideal

En el futuro	In the future
En diez años	In ten years
Me gustaría	I would like
No me gustaría	I would not like
estar soltero	to be single
viajar por el mundo	to travel the world
trabajar en otro país	to work in another country
casarme	to get married
tener una familia grande	to have a big family
tener muchos hijos	to have lots of kids
vivir con mi mejor amigo	to live with my best friend
tener una mascota	to have a pet
*Quisiera	*I would like (more formal)



Revision time



Quizlet



Spanish- English
Flashcards



Say the
words aloud



Cover the
English meanings



Write down
the words



Check your
spelling

What is Health and Safety?

Safety is **anything** that people do to protect themselves or others from harmful accidents.

People can prevent accidents by following safety measures (rules). Safety measures involve knowing when an accident might take place and then taking steps to keep it from happening.



Risk – a chance of getting hurt by something (what could happen?)



Hazard – something that is dangerous and likely to cause harm.



Prevention – the act of stopping something or someone from doing something that could cause harm.



Risk Assessment – a way of identifying risks in activities or situations when using objects.



Emergency Stop

Used in an emergency to cut the power to the machinery. Can be turned off by another person in the event of an accident.

Health and Safety signs

Yellow signs show a warning, hazard or risk.



Red signs show 'danger' and are 'do not' commands.



Blue signs show safety activities or actions that **MUST** be followed.



Green signs show emergency information



Tools and Equipment

Picture	Name	Function
	Vice	To hold material firmly in place
	Tenon Saw	Cut rough, straight lines
	G-Clamp	Secure material to machines or worktop
	Abrasive Paper	Smooth material by hand
	Coping Saw	Cut curved, intricate lines manually
	Fret Saw	Cut curved, intricate lines mechanically
	Band facer	Quickly smooth edges on wood
	Pillar Drill	Create holes in material

Workshop Rules

No running.

Wear an apron.

Do not use machinery, tools and equipment until you have seen a demonstration on how to use it.

Listen carefully and follow teacher instruction.

Stop what you are doing when asked.

No messing about or silly behaviour.



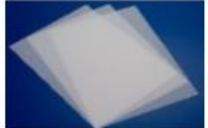

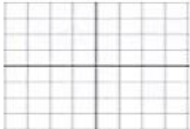

Tie back long hair.

One person to a machine.

Coats, bags and blazers stored safely out of the way.

Year 7 Graphics Knowledge Organiser

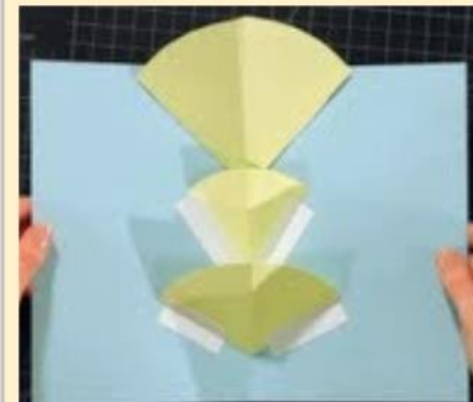
Types of paper

Type	Picture	Properties	Uses
Layout paper		Lightweight, thin, cheap, smooth surface	Used in everyday printing
Corrugated card		Strong and lightweight	Used for packaging and product protection
Tracing paper		Good transparency, thin & expensive	Used for tracing images
Cartridge paper		Heavier weight, good quality, opaque	Used in art for sketching
Grid paper		Covered with continuous square grid	Used in many maths contexts
Isometric paper		Covered with continuous isometric grid	Used in many design contexts

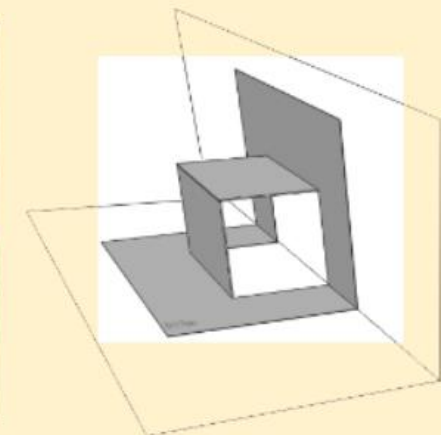
Paper Sizes



Pop-up Mechanisms



V-Fold Mechanism



Internal Stand Mechanism



Key words

Brief

Isometric drawing

Graphics

Stock Forms

Mechanism

Personal Hygiene



- A** Remove jewellery including watches
- B** Nails kept short and clean
- C** Hands should be dried
- D** Food should not be handled when ill
- E** Aprons should be worn when handling food
- F** Cuts and wounds must be covered with a blue plaster
- G** Hands must be washed
- H** Food should not be handled for long periods of time

Personal Protective Equipment



Protective clothing must be worn



Wear gloves



Wear protective apron



Hairnets must be worn



Health & Safety



Risks in a kitchen	Hazards in a kitchen
Fires	Gas, open flames
Cuts	Knives / sharp objects
Burns	Ovens / heat
Scalds	Boiling water / steam
Slips	Spillages
Trips and falls	Objects on the floor

Handwashing

Food handlers should always wash their hands:

- Before Handling food
- After going to the toilet
- After coming in from outside
- After coughing, sneezing, or blowing your nose
- After touching money
- After handling rubbish or the rubbish bin
- After touching animals or insects
- After handling raw eggs, raw meat, raw fish or raw poultry



Key words



Hygiene - The standards to which people keep themselves or their environment clean.



Bacteria - Microscopic, single-celled living organisms, some of which can cause food poisoning.



Personal - Belonging or affecting a person rather than a group.



Function - The way in which something works or operates



This is a food production area

Food Hygiene



- A** Wash all fruits and vegetables
- B** Clean work surfaces regularly
- C** Store food at the correct temperature
- D** Cook foods properly
- E** Keep cooked food and raw food separate
- F** Wash and dry all dishes thoroughly

Food Storage: expiration dates



USE BY

vs.



BEST BEFORE

Use By - Food must be eaten by this date to prevent food poisoning

Best Before - Food can be eaten past this date but it might not be at its best quality

Design and Technology Knowledge Organiser

Y8

Keyword	Definition	Picture code
Environment	The air, water or land in or on which people, animals and plants live.	
Sustainability	The level to which resources can be used without them becoming unavailable in the future.	
Economy	How money is made, organised and used in society.	
Social	Relating to society and living together in an organised way	
Carbon footprint	A measurement of the amount of carbon dioxide produced by the activities of a person, company etc.	

What is Sustainability?

Sustainability is the idea that humans must interact with the environment in a way that ensures there will be enough resources left for future generations



Product lifecycle



3 Pillars of Sustainability

Environmental



Relating to the natural world and the impact of human activity on its condition.



Social



Relating to society or an organization. Living together in an organised way.



Economical



To make sure to be careful not to waste money or resources.



What is sustainability?



Sustainability Explained

Packaging symbols explained



The 'Mobius Loop' shows it can be recycled



Producer contributes to a packaging recovery scheme



Widely recycled by 75% or more Local Authorities (LAs)

The 6R's of sustainability

Designers must consider the impact that their products will have on society. Apply the 6R's of sustainability when designing a product.



RECYCLE

Recycle

- Can the materials be recycled?
- Is the product made from recycled materials?



RETHINK

Rethink

- Is there a better way to solve this problem that is less damaging to the environment?
- Are there alternative materials or design options that are more sustainable?



REFUSE

Refuse

- Do we need all this excess packaging?
- Is the product necessary?



REDUCE

Reduce

- Can we reduce the amount of material we are using?
- Can the use of unsustainable materials be reduced or not used at all?
- Can reduce the distance it has travelled?



REPAIR

Repair

- Is the product easy to repair?
- Is there the possibility the product is able to be repaired rather than thrown away?



REUSE

Reuse

- Is there another way this product can be used?
- Can parts of the product be reused in a different product

Environmental, social and economic challenges that influence designing and making

When a product is designing, the designer doesn't just think about how it will work. They may have to alter (change) the design due to the effect it has on the environment, our society or the economy.



Polymers

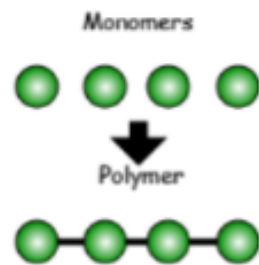
Polymers can be split into 2 subcategories; Thermoforming and thermosetting.

Plastics come from natural materials like cellulose, coal, crude oil and natural gases.



GREEK MEANING

Poly – Many
Meros – Parts



Flow Diagrams

Symbol	Name of symbol	Typical use in a flow chart
	Start/End	Marks the start or end point of a program or sequence
	Decision	These are yes or no questions which determine the next step of the process
	Process	Determines the action required

Plastic Recycling Symbols

- 1. PET or PETE**
Polyethylene Terephthalate
Plastic bottles, fruit and veg containers
- 2. HDPE**
High-Density Polyethylene
Milk bottles, shampoo bottles, reusable plates and cups
- 3. PVC or V**
Polyvinyl Chloride or Vinyl
Window frames, pipes, blister packs, flooring
- 4. LDPE**
Low-Density Polyethylene
Plastic bags, cling film, food packaging film
- 5. PP**
Polypropylene
Bottle caps, yogurt pots, hard plastic toys
- 6. PS**
Polystyrene
Foam packaging, disposable cups and plates, takeaway containers
- 7. OTHER**
Miscellaneous Plastics
DVDs, crisp packets, sunglasses, nappies

Key points - Polymers

Thermoforming polymers can be reshaped and recycled.
Thermosetting polymers cannot.

Most polymers are **synthetic**.
They are manufactured from carbon-based fossil fuels such as oil.

Polymers are very long molecules made from linking monomers

Most synthetic polymers are made from fossil fuels, a **non-renewable resource**.

Thermoforming polymers are also known as thermoplastics.

Thermoforming



- Can be heated and shaped many times.
- Will soften when heated and can be shaped when hot.
- The plastic will harden when cooled

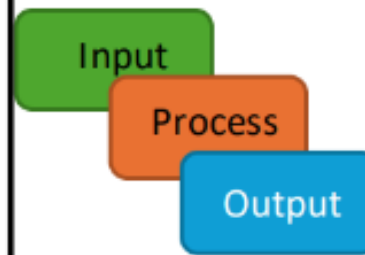
Thermosetting



- Can **only be heated and shaped once**.
- If re-heated they cannot soften as polymer chains are interlinked.

Electronic systems

All systems have an input, a process and an output known as a 'block'
A signal (e.g. electricity) passes from one block to the next.
Each block changes the signal in some way.



Component	Symbol
Bulb	
Cell	
Resistor	
Switch	

The 4 C's

Cleaning



- Keep yourself and your hands clean.
- Wash your hands before handling food and always after going to the toilet.
- Keep work surfaces, equipment and utensils clean.
- Clean dish cloths, tea towels and other cleaning equipment.

Cooking



- Cook thoroughly.
- Cook raw foods to 75°C at the core.
- Reheat foods to 75°C.
- Never reheat food more than once.

Chilling



- Cool cooked food products as quickly as possible to 5°C.
- Core temperature of cooked food must reach <10°C within 150 minutes of end of cooking.
- Foods must be protected from contamination while cooking

Cross-contamination



- Prevent cross-contamination.
- Always separate raw-food from ready-to-eat food
- Use separate equipment, chopping boards and utensils.
- Wash hands thoroughly after handling raw food.

Key words



Contamination - The process of making food dirty or poisonous, or containing unwanted or dangerous substances.



Pathogenic bacteria - Harmful bacteria that can cause illness or disease such as food poisoning.



Symptoms - Any feeling of illness or physical change that is caused by a particular disease.



Source - Where something comes from, starts or the cause of something.

Contamination

Direct contamination

Bacteria is carried from one food to another when they touch. Foods touching, or dripping.
E.g. raw meat touches cooked meat

Cross contamination

The transfer of bacteria from contaminated food (usually raw) to ready to eat foods using objects (vehicle).
E.g. hands, work surfaces, cloths, equipment, chopping boards.






Physical contamination

Foreign matter such as a hair, pests, jewellery, plastic packaging, glass, metals is found and contaminating food.



Food Poisoning



Name of bacteria	Sources
Staphylococcus Aureus	Hands, skin, raw milk, in the nose.
Listeria	Soft cheeses, ready-to-eat foods, meat
E-Coli	Raw meat, mince and poultry, raw milk
Salmonella	Raw eggs, raw meat and poultry, raw milk
Campylobacter	Raw meat and poultry, raw milk, dirty water
Clostridium Perfringens	Raw meat and poultry
Bacillus Cereus	Rice, cheese, raw meat
Common symptoms of food poisoning:     	
Nausea Diarrhoea Stomach cramps Fever Vomiting	



The 4 C's

The 4C's cover the main way to prevent food poisoning:

- Cleaning
- Cross-contamination
- Cooking
- Chilling



Key words



Contamination - The process of making food dirty or poisonous, or containing unwanted or dangerous substances.



Pathogenic bacteria - Harmful bacteria that can cause illness or disease such as food poisoning.

Pathogenic Bacteria

The four conditions bacteria need to multiply:

Food (protein), moisture, time and warmth. The pH balance (acidity or alkaline) of a food also influence the growth of bacteria. If conditions are too acid or too alkaline, bacteria cannot grow.



Binary Fission – The multiplication of bacteria

When bacteria have the correct conditions, food, moisture, warmth and time, they multiply by a process called 'binary fission' every 20 minutes.

In this process the **bacterium**, which is a single cell, divides into two identical daughter cells. **Binary fission** begins when the DNA of the **bacterium** divides into two (replicates).



Common food hygiene faults leading to food poisoning

- Preparation of food too far in advance and stored at room temperature.
- Slow cooling.
- Inadequate reheating / cooking.
- Contaminated food.
- Inadequate thawing (defrosting) prior to cooking.
- Food handlers (poor personal hygiene).

Danger Zone thermometer

Boiling point of water = 100°C

Reheat and cook food = 75°C or above
Cooking at 75°C and above kill most bacteria

Keep hot food hot = 63°C or above

Danger Zone 5-63°C
Rapid bacteria growth

Keep cold food cold = below 5°C

Fridge temperature = 0°C to below 5°C

Freezer temperature = -18°C

Freezing temperatures slow bacterial growth

High Risk Foods

High risk foods support the multiplication of bacteria. These foods are usually high in protein and moisture as well as being 'ready-to-eat'.



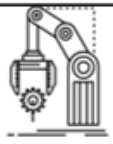

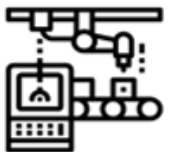




Low Risk Foods

Bacteria are **not able to multiply** in dry food or food containing high concentrations of sugar, salt, acid (vinegar - pickled) and other preservatives



Design and Technology Knowledge Organiser

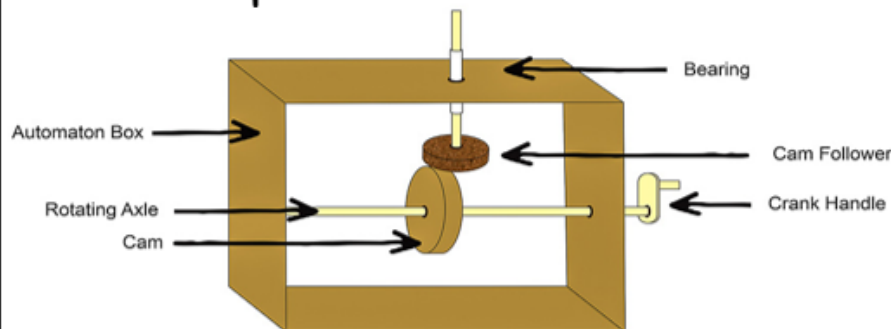
Y9

Key word	Definition	Picture code
Automation	Using computer technology to operate equipment.	
CAD	Computer aided design: using computer software to draw, model and simulate the performance of a product.	
CAM	Computer aided manufacturing: using computer software to control machine tools to make products.	
Laser	A powerful, narrow beam of light that can be used to cut metal and other materials.	
Engrave	To cut or carve words, pictures or patterns onto the surface of hard materials such as metal or stone.	
Cam and Follower	Mechanisms that turn rotary motion into reciprocating motion.	
Automata	A mechanical devices that can be self-operating and follow a predetermined sequence of actions.	

What is an Automata?

An **automata** is a mechanical device that is be self-operated and follows a predetermined sequence of actions. It can be made to look like human or animal figures.

Automata parts




Linear →

Moving in a singular direction in a straight line

Rotary 

Movement that turns in a circle

Movements

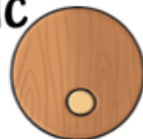
Reciprocating 

Movement that goes back and forth in a straight line

Oscillating 

Movement that swings from side to side

Eccentric



An **eccentric** cam (also called an offset or circular) produce a uniform reciprocating motion



Pear



A **pear cam** (or egg shaped) follower will remain stationary for half of it's rotation then will gently rise and fall



Snail



A **snail drop** cam is used where the drop or fall of the follower must be sudden. **This Cam will only work in one direction**



Heart



A **heart-shaped** cam profile produces a steady rise and fall motion. Movement mimics a heart beat.

