



**BRISTOL  
METROPOLITAN  
ACADEMY**

Monday 21st April	Week A
Monday 28th April	Week B
Monday 5 <sup>th</sup> May	Week A
Monday 12 <sup>th</sup> May	Week B
Monday 19 <sup>th</sup> May	Week A

**Please note:** Maths homework will be on an online platform for this term. It will be set and checked weekly separately from the timetable.

# Knowledge Organisers

## 2024-25

### Year 9 – Term 5

Complete your homework on the night stated e.g. if it is a Monday Week A you will complete ICT/DT

	<b>Week A</b>	<b>Week B</b>
<b>Monday</b>	ICT/DT	MFL
<b>Tuesday</b>	English	English
<b>Wednesday</b>	Science	Science
<b>Thursday</b>	History	Geography
<b>Friday</b>	RS	Music/Art

## Contents

**How to...**Pg 2-3

**Art.....**Pg 4

**Computing.....**Pg 5

**Drama.....**Pg 6-7

**DT.....**Pg 8

**English.....**Pg 9-10

**Food.....**Pg 11

**French.....**Pg 12-14

**Geography.....**Pg 15

**German.....**Pg 16-19

**History.....**Pg 20

**Maths.....**Pg 21-23

**Music.....**Pg XX

**PE.....**Pg 24

**RS.....**Pg 25-27

**Science.....**Pg 28-36

**Spanish.....**Pg 37-39

**Textiles.....**Pg 40

This Knowledge Organiser is to help you see the key information for each subject for this term. You can use this to help you both with homework and with revision, supporting your learning at home. In the table below you will find the instructions for each subject to be completed on the correct day.

Subject	Tasks
Maths	Homework question tasks/sets will be set weekly on an online platform. You will have one week to complete this online, before it is checked for competition and the next set is published.
Science	For term 1 this will be directed by your classroom teacher. It could involve an online platform too.
English	Using the separate question booklet, divide your homework book page in half length ways, write the questions out on the left hand side. First, attempt to answer the questions from memory/your own knowledge. Then use your knowledge organiser booklets to check your answers and fill in the missing ones.
MFL	Find the correct date in the KO and the question booklet. With the list of 10 key words for that week, complete the look – say - cover – write – check method in your homework book. Complete this process for each word/phrase 4 times each.
Geog/Hist/RS/ DT/Computing	Same process as outlined for English above. DT and ICT/Computing have 5 questions and not 10.
Music/Art	For music and art, you will have two practical tasks to complete each term for each subject. These will be found in the question booklets and will be checked by you classroom teacher.

At the back of this booklet, you will find: Sentence starters, a history chronology, DT sentence starters, a periodic table, maps of the world, subject websites, a RAG sheet and a timetable.

# How to present your homework:

**Subject** written on the left-hand side of the page and underlined.  
For example: Food

**Topic** written on the centre of the page and underlined.  
For example: Sugars

**One single straight line** between both pieces of homework.

Subject: Food

Tuesday 25<sup>th</sup> June 2019

Topic: Sugars

keyword	Definition
Monosaccharides	
Disaccharides	
Intensive sugars	
Polysaccharides	

Subject: English

Topic: Macbeth

1. Who are the four most important characters in Macbeth?

Macbeth, Lady Macbeth, Banquo and Macduff.

2. What are three character traits of Banquo?

Gullible, superstitious and ambitious.

3. How would you describe Lady Macbeth?

She is manipulative, cold-blooded and cruel.

4. How is Lady Macbeth two-faced?

She is warm and welcoming to Duncan, and then manipulates her husband to kill him.

5. What is the name of Banquo's son?

Fleance

**Date** written fully on the right-hand side of the page and underlined. This should be the day you complete the homework.

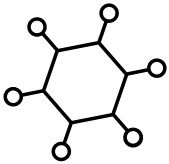
# Home Learning Strategies to help you revise

## Brain Dump



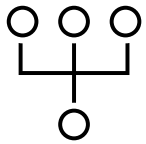
*Write down everything you know about a certain topic on a page. Use your KO to add extra notes in a different colour.*

## Mind Map



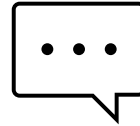
*Condense a topic showing the important links and connectors between key parts. Use your KO to add in extra notes.*

## Diagram



*Draw a clear diagram for a subject including labels and key features. Make sure you use correct vocabulary and spellings.*

## Vocabulary



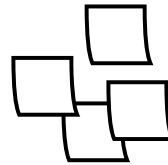
*Learn the key words associated with a topic and commit the word and spelling to memory. Test yourself or ask someone else to test you.*

## Retrieval Quiz



*Write key questions about a topic as well as the answers. Use the content of the KO to help you. Check to see if you can remember the answers without looking.*

## Compare



*Complete a comparison table showing two different sides of a topic. Can you use it to create an argument for one viewpoint?*

# Year 9 Memento Mori

**Content:** In this project you will

**Knowledge**—of different artists who create portraits

**Understand**—What inspired artists to create their work and how to write about the work

**Skills**—drawing, collage, painting, printing, showing the influence of other artists in your own work and presentation

**Outcomes**— Self portraits, celebrity portrait, mixed media portraits, prints, drawings, collage.



**Tim Fowler-** In 2018 Tim Fowler put together a week long performance exhibition at the LCB Depot Gallery space. He started out with 100 blank canvases in a 25 x 4 grid. Over the next few days he worked day and night to paint 100 skull paintings.

## ARTISTS



**Gemma Compton-** Gemma Compton is a Bristol-based artist and fashion designer.

Gemma Compton's vanitas paintings are contemporary works that explore the fragility and strength of life.



Damien Hirst

### Keywords

**Memento Mori**—(Latin for 'remember that you [have to] die') is an artistic or symbolic reminder of the inevitability of death. Some artists use **symbols** such as hourglasses and wilting flowers and skulls that signify the impermanence of human life.

**Vanitas**— Vanitas is a type of still life painting that conveys the fleeting nature of life and the vanity of worldly desires

**Illustration**— a drawing or picture in a book, magazine, for decoration or to explain something.

### Analysis

All artist research pages should be annotated

#### Artwork-

- **Artist name**
- Describe the work-what does it look like?
- Use the formal elements i.e. colour, line etc.
- What techniques/materials were used?
- What is your opinion of the work?
- How is it relevant to your own idea?

#### Sentence starters

I like/dislike the way the artist has used...because

I think the colour scheme used is effective because...

I think the artist has been inspired by...because

#### Evaluation of Your Artwork-

- What inspired you to create the piece?
- What techniques did you use and why?
- What does it mean to you?
- How is it relevant to your idea?



### Assessment

D	<b>Deepening</b> Exceptional, Sophisticated, Perceptive, Imaginative, Masterful.
O+	<b>On Track (secure)</b> — Highly Confident, Refined, Thorough, Assured, In-Depth.
O	<b>On Track (insecure)</b> — Competent, Sustained, Informed, Refined, Thoughtful, Detailed.
Y	<b>Yet to be on track</b> — Attempted, Basic, Some, Uneven.
A	<b>At an earlier stage</b> — Partial, Limited, inconsistent.



# Computing: Term 5

## Number Bases

### Denary

Base 10 Numbers:

23, 46, 2, 9

### Binary

Base 2 Numbers:

01010101

### Hexadecimal

Base 16 Numbers:

2B, FF, 5E, 88

128	64	32	16	8	4	2	1		
0	0	0	0	1	0	1	0	=	10
0	0	1	1	1	1	1	0	=	62
1	0	0	0	1	1	1	1	=	143

8	4	2	1	8	4	2	1		
1	0	0	0	1	1	1	1	=	143
Denary	8	Denary	15						
Hex:	8	Hex:	F	=	8F				

## Binary Arithmetic

### Rules of Addition

0 + 0 = 0

0 + 1 = 1

1 + 0 = 1

1 + 1 = 0 Carry 1

1 + 1 + 1 = 1 Carry 1

				1	1	1		
	0	0	0	0	1	1	1	0
+	1	0	1	0	0	0	1	0
	1	0	1	1	0	0	0	0

## Computational thinking:

### Algorithm:

A sequence of instructions that carries out a task.

### Abstraction:

The process of removing unnecessary detail in a problem.

### Decomposition:

Breaking down a task into manageable tasks.

## Programming:

Pseudocode – A way of representing algorithms using a common language.

Python – A general-purpose programming language.

### Variables:

A memory location where values are stored. The value can be changed later.

E.g.:

### Data types:

Each variable is associated with a data type.

String – any mix of letters, numbers and symbols, e.g. "apple12" or "Miss Thomas"

Integer – A whole number e.g. 42

Real/float – A decimal number e.g. 3.14

Boolean – True or False

Sequence – Executing instructions in order.

Selection – A decision or question. The code makes a choice between two paths.

Iteration – Repeating or looping code.

## Cyber Security:

Encryption – scrambling data, so it cannot be read if it is intercepted by someone who does not have the key.

Firewall – decides which traffic to block and accept on a network.

Malware – software designed to disrupt a computer system.

## Network Hardware

Modem – Allows a device to connect to the internet.

Network switch – Connects devices together using ethernet cables.

Wireless Access Point – Allows devices to send and receive data over the air (WiFi).



Wireless access Point



Modem



Switch



A. Material	B. Colour	C. Condition	D. Fit / style	E. Fashion / purpose
Cotton	Bright colours	Pressed and ironed	Practical	Apron
Cashmere	Dark colours	Clean / pristine	Comfortable	Cardigan, jumper
Wool	Dull / worn colour	Dirty	Formal	Skirt, trousers, dress
Silk	Mix-match	Worn	Tight and fitting	Top, shirt, blouse, shirt, vest top
Felt	Matching	Distressed	Short sleeve	Trainers / daps
Polyester	Colours for labour work	Rips and holes	Long sleeve	Pencil skirt and blouse
Denim	Colours that show wealth and status	Dropped stitches	Flowing (unrestricting)	Flowing dress
Velvet		Hems dropping	Baggy and loose	Blazer / jacket
Tweed		Shiny	Tight and fitting	Short heels / high heels
		Patch work	Revealing (above knees / cleavage)	Shiny shoes
		Fraying edges	Long / short	Unzipped
		Scuffed		

## Year 9 Drama

## Costume

F. Headwear	G. Hair	H. Footwear	I. Accessories	J. Jewellery	K. Makeup
Cap / Truck	Messy and dishevelled	Shoes with soles falling off	Gold buttons	Rings	Eyeshadow
Flat cap	Un-styled	Brogues	Embossed emblem	Watch	Mascara
Headband	Styled	High heels / solitaires	Trim	Locker	Foundation
Clips	Groomed	Shoes with holes	Badge	Brooch	Blusher
Hairband	Parting	Short heels / kitten heels	Scarf	Pearl necklace	Lipstick / gloss
Hat (describe)	Gelled	Shiny leather shoes buffed	Gloves	Pearl earrings	Minimal coverage
	Messy bun	Patent shoes (fake)		Gold studs	Full coverage
	Slick back hair and tight bun	Dirty trainers / converse / daps / glimssoles		Diamonds	Brown to create mud marks
		Unlaced shoes / trainers		Fake gold and silver	Black to create bruising
		Shoes that don't fit		Fake stones (ie diamonds)	Oil to create sweaty look

## Costume

- I am designing a costume for (character).....
- X is (social class).... in the time era of (decade) ....
- X's hair would be... Column G (describe)
- X's makeup would be... Column K (describe how markings would be created))
- X would wear.. Column E&C (list the items she would wear in column E)
- The fit / style would be... Column D (describe each item)
- The materials would be... Column A&C (describe materials for each item)
- The colours would be... Column B (describe colours for each item)
- X footwear would be... Column H&C (describe)
- X accessories would be... Column I&C (describe)
- X jewellery would be... Column J&C (describe)

## Keywords to use when designing sound

- Diegetic (can be heard by actors)
- Non-diegetic (cannot be heard by actors)
- Underscore (to accompany the action) this can be live or pre-recorded
- Instruments (strings, woodwind, brass, percussion, keyboards)
- Live music, synthesized music, recorded music, instrumental music
- Atmosphere, mood (i.e. tense, calm, dramatic, cheerful)
- Ambience, dramatic, tense, so
- Rhythm, pace
- Sound effect (live, pre-recorded)
- Volume, amplified
- Music era (what year is the scene set in? What music was current at that time)

## Sound

## EXAMPLE SENTENCE STARTERS FOR THE BUS SCENE

- As the sound designer of this extract I want to create an atmosphere that starts..... then turns into a ..... atmosphere
- A piece of 1970's music like ..... could be played at the start when everyone gets on the bus to create a ..... atmosphere
- As the bus pulls away the sound effect I will play is .....
- When Sammy starts arguing with the conductor I will play.....
- When Sammy pulls out the knife the mood will change to .....
- When the knife is pulled, the non-diegetic sound (cannot be heard by actors) of the underscore music will include these instruments.....
- The volume of the ..... will be amplified when .....
- The pace and rhythm of the music will be .....
- I will also have a pulsating heart beat non-diegetic sound effect playing when .....
- The diegetic sound of the ringing bus bell (can be heard by actors) ..... would be played when .....
- When the bus stops I would have the diegetic sound effect of ..... playing

## Sound



## Specials

**Gobo** - Projects a shape onto the stage.



**Back lit spotlight** - creates a silhouette effect.



**Cycorama** - Background device used to create the illusion of any, open space, or great distance at the rear of the stage setting.

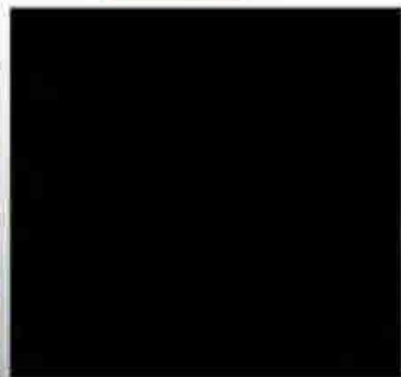


## Washes

**A General Wash**



**Blackout**



## Adding Colour

A Wash is like a "Wash" - A wash of uniform colour given to the light.

1. Yellows and oranges are "warm" colours for sunny days or happy times.
2. Red blues are "cold" colours for less happy times.
3. As with everything in lighting, there's absolutely no reason why you should follow any of these rules.

## Creating a Mood

**Blue**



## Lighting with a Gauze

A **Gauze** (UK) or **Scrim** (USA) is a coarsely woven cloth which can appear transparent or solid depending on how it's lit.

**Back Lit**



**Top Lit**



**LIGHTING**

## EXAMPLE SENTENCE STARTERS USED IN KITCHEN KNIFE SCENE

- At the start of the scene I will have this type ..... lighting in the colour of .....
- As the tension begins to rise I the lighting will .....
- As Mrs Lyons turns and sees the kitchen knife on the side the lighting will.....
- As Mrs Lyons grabs the knife and holds it up in the air the lighting will.....
- As the two women struggle the lighting will .....
- As Mrs Johnstone manages to snatch the knife from Mrs Lyons the lighting will.....
- At Mrs Johnstone screams 'Go!' the lighting will .....
- When the kids chanting can be heard the lighting will.....



## Year 9 D&T – Pewter Project

### What is pewter?

- Pewter is a malleable metal alloy consisting of tin, antimony, copper, bismuth, and sometimes silver. Modern pewter consists of are 94% tin.
- Pewter has a low melting point (around 170–230 °C) making it ideal for melting on a chip forge and brazing hearth and casting

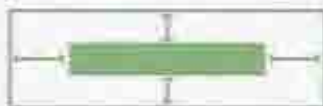
### Elements of Design

## LINE



A line is a mark between two points. There are various types of lines, from straight to squiggly to curved and more.

## SPACE



Space is the area around or between elements in a design. It can be used to separate or group elements.

## SHAPE

Height + width = shape. There are three basic shapes: Geometric (triangles, squares, circles etc), natural (leaves, animals, trees, people) and abstract (see image).



## TEXTURE



Texture relates to the surface of an object; the look or feel. Concrete is rough; metal is smooth.

### 2D Design Basic Tools



- SELECT** – Use this tool to select different tools and highlight objects.
- LINE** – This tool creates straight lines. Click to start the line, extend out and click to finish.
- CIRCLE** – This tool creates circle shapes. Click to start the circle, extend to the size needed and click to finish.
- PATH** – This tool creates curved lines through continual clicks.
- RECTANGLE** – This tool can be used to create both rectangular and square shapes.
- TEXT** – Use this tool to insert text onto your designs. The font, size and direction of the text can be changed.
- DELETE PART** – Use this tool to delete separate lines and objects.
- DELETE ANY** – Use this tool to delete whole lines and objects.

### Computer aided design (CAD)

Computer aided design now has the capability to design new products in 3D, visualise them in a variety of materials and send images around the world for collaboration and consultation. Once production is finalised, these designs are sent to computer aided manufacture (CAM) machines to be formed. Autodesk and Solidworks are common forms of CAD software used.

Advantages of CAD	Disadvantages of CAD
Ideas can be drawn and developed quickly	Expensive to set up
Designs can be viewed from all angles and with a range of materials	Needs a skilled workforce
Some testing and consumer feedback can be done before costly production takes place	Difficult to keep up with constantly changing and improving technology

### Isometric Drawing Shows Objects at 30°

- Isometric drawing can be used to show a 3D surface of an object.
- It doesn't show perspective (things don't get smaller in the distance), but it's good to get dimensions right.
- There are three main rules when drawing in isometric:



### Crating Can Be Used to Draw 3D Shapes

Crating is where you start by drawing a box — the 'crater' — and gradually add bits on and take bits off till you get the right shape. For example, you can remove sections from a cuboid to make any other 3D shape.

- When you're sketching a 3D object, it's easier if you imagine it as a 'crater' shape.
- First draw the basic geometric shape (crater).
- Think of a particular drawing technique — isometric drawing, for example.
- The object can then be drawn within the box.
- Details of the object can be added by drawing more geometric shapes on top.



### What is an Alloy?

**Definition:** A metal alloy is a substance that combines more than one metal or mixes a metal with other non-metallic elements.

#### Example

Iron + Carbon = Steel  
Copper + zinc = Brass

What other alloys can you think of?

#### Malleable

**Definition:** A material that can be hammered or pressed into shape without breaking or cracking.



### Computer aided manufacture (CAM)

By using Computer aided manufacture, designs can be sent to CAM machines such as laser cutters, 3D printers and milling machines.

Advantages of CAM	Disadvantages of CAM
Fast and accurate production	Expensive to set up
Machines can run constantly on repetitive tasks	Needs a skilled workforce of engineers



Reading Shakespeare's Imagination: *A Midsummer Night's Dream*

Plot	Key Characters	Key Quotations	Key Themes
<p>Four lovers, having an argument in the Athenian woods at midnight, are confused by fairies who are only trying to help. Throw in some magic, a custody battle over a little boy, and an amateur actor who unsuspectingly becomes the fairy queen's love interest... oh and a magic set of ass's ears... and there you have it - <i>A Midsummer Night's Dream</i>, a comedy.</p> <ul style="list-style-type: none"> <li>Hermia runs away with Lysander instead of marrying Demetrius.</li> <li>The King and Queen of the fairies fight over a little boy.</li> <li>Puck muddles up the lovers and causes havoc with a love potion.</li> <li>Bottom gets the ears of an ass and Titania falls in love with him.</li> <li>Oberon puts things right and wins the little boy from Titania.</li> <li>The lovers get married. Bottom's friends put on a play to celebrate.</li> <li>The play is about Pyramus and Thisbe.</li> <li>The fairies bless the marriages.</li> </ul>	<p><b>Puck</b> – Also known as Robin Goodfellow, Puck is Oberon's jester, a mischievous fairy who delights in playing pranks on mortals.</p> <p><b>Lysander</b> - A young man of Athens, in love with Hermia.</p> <p><b>Demetrius</b> - A young man of Athens, initially in love with Hermia and ultimately in love with Helena.</p> <p><b>Hermia</b> - Egeus's daughter, a young woman of Athens. Hermia is in love with Lysander and is a childhood friend of Helena.</p> <p><b>Helena</b> - A young woman of Athens, in love with Demetrius.</p> <p><b>Bottom</b> - The overconfident weaver chosen to play Pyramus in the craftsmen's play for Theseus's marriage celebration.</p> <p><b>Oberon</b> - The king of the fairies.</p> <p><b>Titania</b> - The beautiful queen of the fairies.</p> <p><b>Egeus</b> - Hermia's father, who brings a complaint against his daughter to Theseus.</p> <p><b>Theseus</b> - The heroic duke of Athens, engaged to Hippolyta. Hippolyta - The legendary queen of the Amazons, engaged to Theseus.</p>	<p>"Ay me, for aught that I could ever read, Could ever hear by tale or history, The course of true love never did run smooth ..."</p> <p>"If we shadows have offended, Think but this, and all is mended: That you have but slumbered here, While these visions did appear; And this weak and idle theme, No more yielding but a dream, Gentles, do not reprehend. If you pardon, we will mend."</p> <p>"Though she be little she be fierce"</p> <p>"I must go seek some dewdrops here, And hang a pearl in every cowslip's ear"</p> <p>"Cupid is a knavish lad, Thus to make poor females mad."</p> <p>"Love looks not with the eyes, but with the mind, And therefore is wing'd Cupid painted blind."</p> <p>"Lord what fools these mortal be"</p> 	<p><b>Love:</b> Shakespeare explores the lighter side of love in <i>A Midsummer Night's Dream</i>. Love makes us behave in strange ways – the lovers fight in a most uncivilised way in the woods. It can bring out the best and bravest qualities in a character – Hermia risks her life for love. Lovers often feel invincible against a world that doesn't understand them, just as Hermia and Lysander stand alone against Athens's law. Love can make us ridiculous – Helena asks a boy to treat her like a dog, whilst Titania falls in love with a donkey. Love can be cruel – Helena and Demetrius fall desperately in love with someone who doesn't love them back. Love also has a powerful magical quality: falling in love can be like being under a spell.</p> <p><b>Appearance and Reality:</b> Sometimes things are not quite what they seem. Sometimes we fail to see situations as they really are. People often pretend to be something that they're not, hiding their true selves for one reason or another. Shakespeare was really interested in this idea and explored it in many of his plays. This theme is usually referred to as appearance and reality.</p> <p><b>Order and Disorder:</b> Much of the comedy of <i>A Midsummer Night's Dream</i> comes from the chaos created when the natural order of things is disrupted. But there's a darker side too. There's not one character that isn't relieved when Oberon finally restores the midnight world to a happier one by d</p> 
<p><b>Context</b></p> <p>The most influential writer in all of English literature, William Shakespeare was born in 1564 to a successful middle-class glove-maker in Stratford-upon-Avon, England. Shakespeare attended grammar school, but his formal education proceeded no further. In 1582 he married an older woman, Anne Hathaway, and had three children with her. Around 1590 he left his family behind and travelled to London to work as an actor and playwright. Public and critical success quickly followed, and Shakespeare eventually became the most popular playwright in England and part-owner of the Globe Theatre. His career bridged the reigns of Elizabeth I (ruled 1558–1603) and James I (ruled 1603–1625), and he was a favourite of both monarchs. Indeed, James granted Shakespeare's company the greatest possible compliment by bestowing upon its members the title of King's Men. Wealthy and renowned, Shakespeare retired to Stratford and died in 1616 at the age of fifty-two.</p>			



## Unit 2: Shakespeare

### Poetry:

*Spellbound* Emily Bronte

*The Poison Tree* William Blake

*Still I Rise* Maya Angelou (consider Helena's voice, link with other characters who are marginalised)

*The Magic of the Mind* by Clive Webster

*Do you carrot All for Me?* Anon (humour and word play)

### Poetic terms

**Meaning** – the main message of the poem

**Speaker** – the voice of the poem.

**Imagery** – the words which paint images in the reader's mind.

**Simile** – indirect comparison (like/as)

**Metaphor** – direct comparison

**Personification** – when a non-living object is described as looking like or behaving like a human.

**Tone** – the feeling/atmosphere of the poem

**Structure** – the organisation of the poem, its rhyme scheme, the rhythm.

**Stanza** – grouped lines in a poem

**Form** – the type of poem – i.e. sonnet, ode.

**Caesura** – punctuation which occurs mid-line; slows the rhythm.

**Enjambment** – lack of terminal punctuation, speeding up the poem.

**End-stopping** – punctuation at the end of a line

**Metre** – number of beats per line

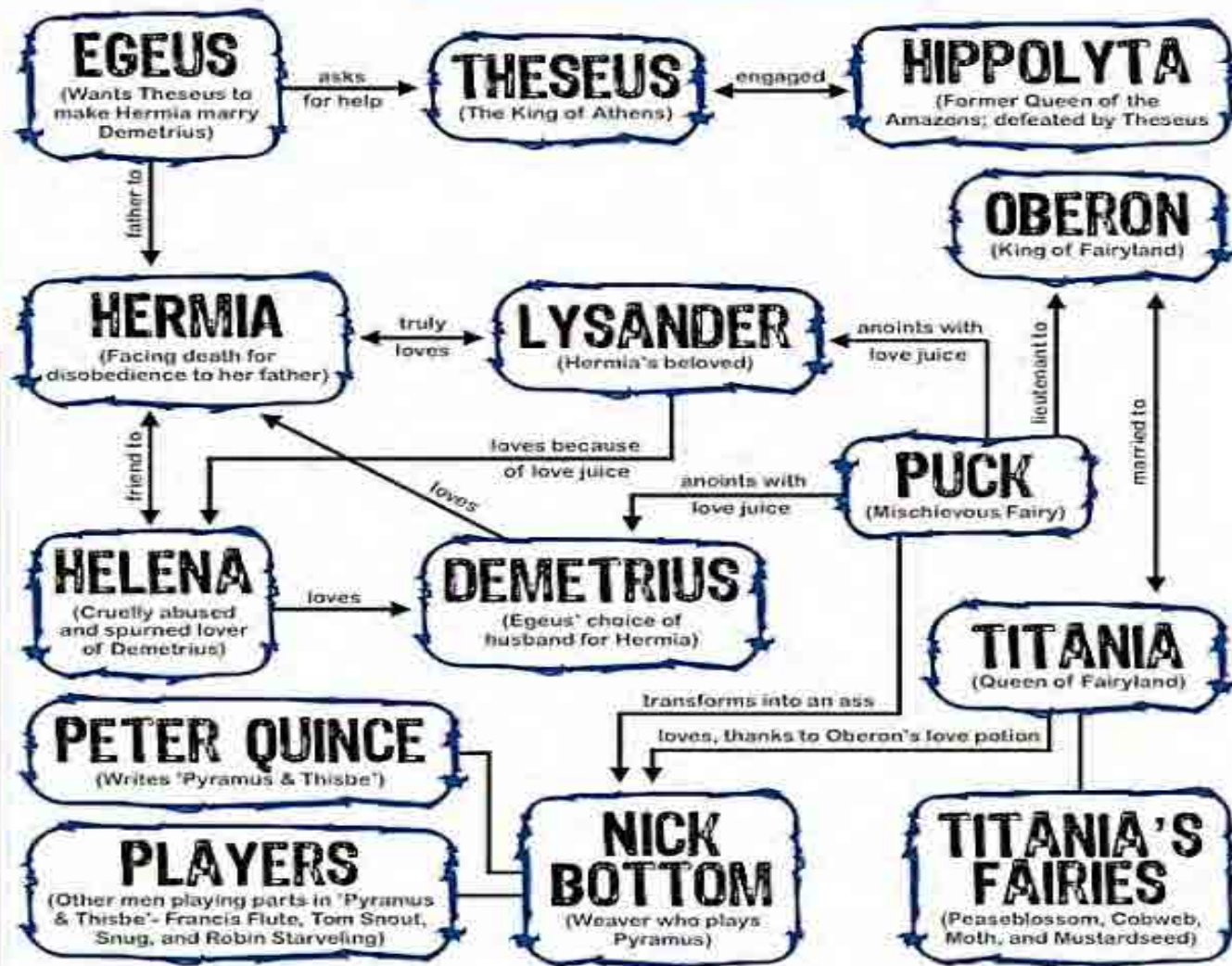
**Plosive** – sound made by stopping airflow – b, t, k, d, p; it creates a harsh sound.

**Onomatopoeia** – a word which sounds like the thing it is describing – i.e. bang

**Alliteration** – the repetition of the same sound

**Sibilance** – the repetition of the 's' sound

### Relationships in the play



**Literature terminology** - Symbolism, motif, archetype, soliloquy, allusion, lyricism, farce, comedy



What do we need **proteins** for?Fu  
nc  
tio  
ns

- Build enzymes and hormones
- Build cell membranes
- Repair and maintain tissues
- Defend the body (antibodies)
- Secondary source of energy

## What happens if we have too much or too little?

Ex  
ce  
ss

- Kidney and liver diseases
- Weight gain

De  
fic  
ie  
nc  
y

- Kwashiorkor
- Slowing growth rate
- Swelling

## Protein alternatives

Vegetarians and vegans don't consume meat so instead they use protein alternative products which are manufactured in order to provide protein in a diet and protein rich foods.



Soy chunks



Tofu



Textured vegetable protein (TVP)



Tempeh



Beans, lentils, chickpeas

What do we need **carbohydrates** for?Fu  
nc  
tio  
ns

- Primary source of energy
- Store energy for later
- Build DNA
- Prevent the body from using proteins as an energy source

## What happens if we have too much or too little?

Ex  
ce  
ss

- Tooth decay
- Type 2 diabetes
- Weight gain and obesity
- Hyperglycaemia

De  
fic  
ie  
nc  
y

- Weight loss
- Lack of energy, tiredness
- Severe weakness
- Hypoglycaemia

What do we need **fats** for?Fu  
nc  
tio  
ns

- Source of energy
- Insulation
- Dissolve vitamins
- Build hormones
- Build cell membranes

## What happens if we have too much or too little?

Ex  
ce  
ss

- Obesity
- Hypertension
- Coronary heart disease
- Fatty liver disease
- Type 2 diabetes

De  
fic  
ien  
cy

- Weight loss
- Vitamin deficiency
- Heart disease
- Feeling cold

There are two different types of fats

Proteins can denature when:



They are heated



They come into contact with acidic/alkaline ingredients



They are whisked, beaten or kneaded



Proteins unravel becoming firm when heated

<https://www.ifst.org/lovefoodlovescience/resources/carbohydrates-gelatinisation>  
<https://www.ifst.org/lovefoodlovescience/resources/fats-and-oils-aeration>  
<https://www.ifst.org/lovefoodlovescience/resources/fats-and-oils-plasticity>

## Visible fats



Fats you can see, such as on meat are often saturated.



Invisible fats



Unsaturated fats you cannot see, such as in nuts and avocados. They are often good for the brain.



Butter



Cream



Eggs



Saturated



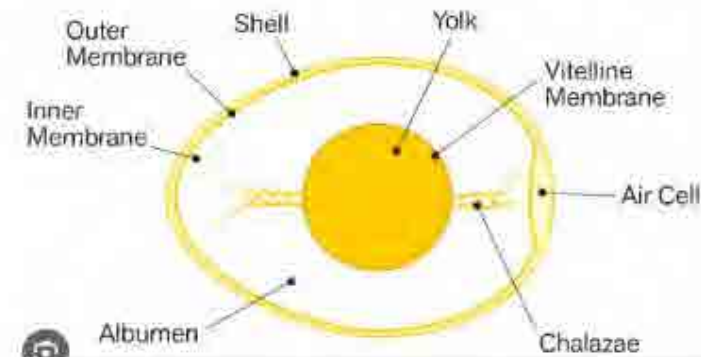
Olive oil



Unsaturated



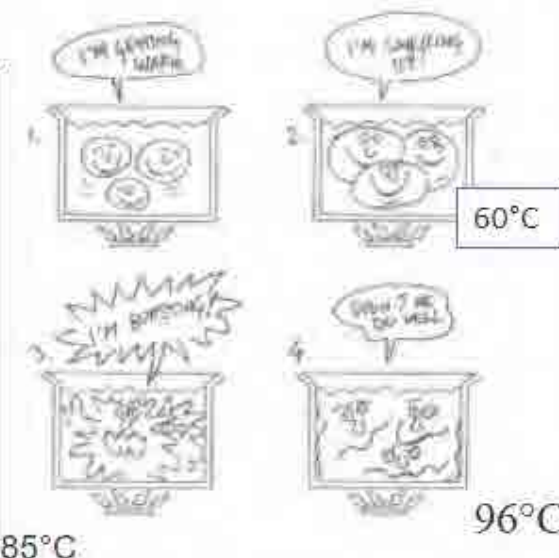
Avocado



## The food science bit!

Thickening sauces with starches.

- **Gelatinisation** happens when a **starch** and liquid mixture are heated.
- The water enters the **starch** granules and they **swell** and change texture.
- As more water is taken in, the granules expand, and the mixture becomes **viscous** and **thick**.
- This results in a **gel** which thickens sauces by the process of **gelatinisation**.



**Gelatinisation** happens when **starch** and liquid such as water are heated together



## 9.12 Festivals

### French Vocab List

Quelle est ta fête préférée?	What is your favourite festival
Ma fête préférée est...	My favourite festival is...
Le Noël	Christmas
Le Réveillon de Noël	Christmas Eve
La Saint-Sylvestre	New Year's Eve
Le Nouvel An	New Year's Day
Le Divali	Divali
Pâques	Easter
Le Hanoukka	Hanukkah
L'Aïd	Eid
Le premier avril	April Fool's day
L'anniversaire	Birthday
Le premier mai	May day
Une fête	Party
La fête des Mères	Mother's day
La fête de la musique	Music festival
Un jour férié	Bank Holiday
Le mariage/les noces	Marriage/wedding
Le 14 juillet	Bastille Day
La Saint-Valentin	Valentine's day
Le Mardi Gras	Shrove Tuesday

Qu'est-ce qu'on fait pour célébrer?	What do we do to celebrate?
Je me lève	I get up
Je me douche	I shower
Je m'habille	I get dressed
Je reçois des cadeaux	I receive presents
J'éteins des bougies	I blow candles out
Je décore l'arbre de Noël	I decorate the Christmas tree
J'achète des nouveaux vêtements	I buy new clothes
Je vais à l'église	I go to church
Je vais à la mosquée	I go to the mosque
Je vais à la place	I go to the square
Je vais à la maison de ...	I go to ...'s house
... arrive	... arrives
Nous mangeons...	We eat...
Nous jeûnons	We fast
Nous jouons des jeux de société	We play board games
Nous célébrons	We celebrate
Je m'amuse bien	I have a good time
Je regarde des feux d'artifices	I watch the fireworks
Je vais au lit	I go to bed
Je me couche	I go to sleep
C'est comment?	How is it like?
passionnant	Exciting
inoubliable	unforgettable
amusant	Fun
insupportable	Unbearable
Un désastre	A disaster

Les phrases/verbes du passé	Phrases/verbs in the past
L'année dernière	Last year
Le mois dernier	Last month
Avant hier	The day before yesterday
La semaine dernière	Last week
Hier	Yesterday
Dans le passé	In the past
Quand j'avais ... ans	When I was ... years old
L'été dernier	Last summer
L'hiver dernier	Last winter
Il y a ... (deux ans)	... ago (two years)
Le weekend dernier	Last weekend
Je suis allé(e)	I went
J'ai célébré	I celebrated
J'ai mangé	I ate
J'ai bu	I drank
J'ai ouvert	I opened
C'était	It was
Les phrases/verbes du futur	Phrases/verbs in the future
L'année prochaine	Next year
Le mois prochain	Next month
Après demain	The day after tomorrow
Demain	Tomorrow
La semaine prochaine	Next week
Dans le futur / à l'avenir	In the future
Quand j'aurai ... ans	When I will be ... years old
L'été prochain	Next summer
Je vais aller	I am going to go
Je vais célébrer	I am going to celebrate
J'ai l'intention de manger	I intend to eat
Je voudrais/j'aimerais boire	I would like to drink





## 9.12 Festivals and Culture

### Listening check-list

#### Before I listen ...

1. read the exercise carefully, paying attention to the instructions and pictures
2. think of possible words, phrases and ideas I might hear
3. think about how these words and phrases would be pronounced
4. think of the different ways certain phrases could be expressed

#### While I listen, pay attention to...

5. repetition or paraphrase
6. time marker phrases
7. the questions and tasks that go with the passage
8. all the things I predicted (questions, vocabulary, possible answers)

#### While I listen, I work out any words I don't know by...

9. using the words I understand to get the general meaning of the passage first
10. listening to words that come before or after the unknown word
11. using my general knowledge to think about what the unknown word might logically mean
12. listening to what comes later in the passage for further clues, or to check whether the unknown word does in fact mean what I think it means
13. using what I know about sentence structure to work out what kind of word it is (noun, adjective, verb)
14. thinking whether the unknown word is like a word I know in English or French/German/Spanish, and then checking whether that meaning would make sense

### Reading – Top tips

- Read the introduction to the question carefully. This will help you to give sensible answers. Look for titles.
- Answer every question, especially where you must write a letter. If in doubt, have a guess.
- Read the whole of the sentence so that you can check that your first reaction is right. If you think the answer is 'P' (positive) for example, read on in the text to make sure that the correct answer is not in fact 'P and N' (positive and negative).
- Do not copy whole chunks of the text because you might include the wrong answer as well as the right answer.
- If you are asked to give **one** reason or **one** detail, only give one.

### VOCABULARY IS KEY!

Look through the vocab lists and try to refresh your memory of as much vocabulary as possible.

### Translation – Top tips

- Read the whole sentence/paragraph first.
- Chunk the sentences e.g. I play / videogames / in my bedroom.
- Highlight what you don't know.
- Be as ACCURATE as you can; what are you being tested on, look out for different time markers.
- Make sure you reread your translation; does it make sense?





<b>Les pays francophones</b> La France Le Cameroun Le Sénégal La Corse La Guadeloupe La Suisse La Belgique L'Algérie La Tunisie La Guinée La Guyane La Côte d'Ivoire La Polynésie Française Le Bénin Le Burkina Faso Le Burundi Le Canada Le Tchad Le Congo Le Djibouti Le Haïti Le Luxembourg Le Madagascar La République du Mali Le Monaco Le Niger Le Rwanda Les Seychelles Le Togo Le Vanuatu Les Antilles	<b>French Speaking Countries</b> France Cameroon Senegal Corsica Guadeloupe Switzerland Belgium Algeria Tunisia Guinea French Guiana Ivory Coast French Polynesia Benin Burkina Faso Burundi Canada Chad Congo Djibouti Haiti Luxembourg Madagascar Mali Monaco Niger Rwanda Seychelles Togo Vanuatu French speaking Caribbean Islands	<b>Les directions</b> nord nord-est est sud-est sud sud-ouest ouest nord-ouest	<b>Directions</b> north northeast east southeast south southwest west northwest	<b>La langue de tous les jours</b> Bonjour! Bienvenue. Pardon, excusez-moi. Parlez-vous anglais? Je ne parle pas français. À tout à l'heure! Merci/Merci beaucoup. Au revoir! De rien. Je ne comprends pas. Où est un bon restaurant/un bon café? Où est la plage/le centre-ville? Je cherche le métro/le gare/l'aéroport. Je cherche l'hôtel/l'hôpital/la banque. Pourriez-vous prendre ma photo/notre photo? Il n'y a pas de quoi Vas-y, Allez-y Bonne soirée! À demain! Je suis désolé(e) Tu t'appelles comment? Je suis perdu Attention! Fais/faîtes attention! Bien sûr C'est n'importe quoi! Laisse tomber... Ça te dit?/Ça vous dit? Tiens-moi au courant! Bref T'sais? Ça te changera les idées...	<b>Everyday language</b> Good morning, hello Welcome Pardon, excuse me. Do you speak English? I do not speak French. See you later! Thank you/Thank you very much. Goodbye! You're welcome. I do not understand. Where is a good restaurant/a good café? Where is the beach/city center? I am searching for the metro/train station/airport I am searching for the hotel/hospital/bank. Can you take my/our photo? It's nothing/don't mention it Go on, go ahead Good evening! See you tomorrow! I'm sorry What's your name? I'm lost Careful! Be Careful! Of course That's nonsense! Forget it... You up for it? Keep me up to date! all in all Ya know? It'll take your mind off things...
		<b>La géographie</b> Je suis francophone Une langue maternelle L'Hexagone Les DOM TOM L'outre-mer Le métropole Un territoire Un département Une région	<b>Geography</b> I speak French Mother tongue France (slang) French overseas territories Overseas Mainland France Area Department Region		
		<b>L'histoire</b> La révolution française La colonisation La civilisation Le conflit La culture Le cinquième république L'indépendance La liberté La Renaissance Un siècle Contemporain Moderne Laïque	<b>History</b> The French Revolution Colonisation Civilisation Conflict Culture The 5th Republic Independence Freedom The Renaissance A century Contemporary Modern Secular		



## Year 9 Geography Sustainable Citizen

Sustainable development goals	a collection of 17 interlinked global goals designed to be a "blueprint to achieve a better and more sustainable future for all"
Economic sustainability	practices that support long-term economic growth without negatively impacting social, environmental, and cultural aspects of the community.
Social sustainability	a measure of welfare where people can flourish and have the best lifestyle for themselves.
Environmental sustainability	the practice of interacting with the planet responsibly.
Grey water recycling	uses existing plumbing in your home to recycle old water for new uses.
Waste	items that are no longer of use.
Circular economy	is a system which maximises the value of resources by recycling and repurposing them as much as possible.
Linear economy	waste as a side result of the production, process, is discarded into the environment.
Incineration	the burning of waste.
Carbon footprint	the amount of carbon dioxide released into the atmosphere by a person or organisation.



Sustainable cities use strategies such as vertical planting to improve air quality and access to nature for urban residents

Bristol Harborside is a local example of how green initiatives have been installed into the fabric of our city. How do you think this has improved the lives of nearby residents?



Recycling is a waste processing technique which saves energy by reusing our waste products instead of having to make 'new' packaging from new materials. This saves energy in the long run but can require expensive equipment and expertise to set up.

### Fashion, is it sustainable?

#### Ethical fashion

**fashion that aims to reduce the negative impact on people, animals, and the planet.** Producing an item of ethical clothing involves design, labour, and materials, and ethical fashion is kind to the planet and people every step of the way, from seed to garment.

#### Fast fashion

Fast fashion is the term used to describe **clothing designs that move quickly from the catwalk to stores to take advantage of trends.** The collections are often based on styles presented at Fashion Week runway shows or worn by celebrities.



A landfill site, also known as a tip, dump, rubbish dump, garbage dump, or dumping ground, is a site for the disposal of waste materials.



**Was ist dein Lieblingsfach?**

Englisch  
Spanisch  
Französisch  
Theater  
Kunst  
Sport  
Informatik  
Musik  
Technologie  
Erdkunde  
Geschichte  
Religion  
Mathe/Mathematik  
Naturwissenschaften  
Biologie  
Chemie  
Physik  
Deutsch

**Wie findest du?**

Es ist  
interessant  
praktisch  
nützlich  
nutzlos  
einfach  
Leicht  
schwer  
schwierig  
langweilig  
praktisch  
spannend  
kreativ  
wichtig  
zu  
sehr  
ziemlich

**Favourite Subject.**

English  
Spanish  
French  
Drama  
Art  
PE  
Computer Science  
Music  
Technology  
Geography  
History  
RE  
Maths  
Science  
Biology  
Chemistry  
Physics  
German

**What do think about?**

It is  
Interesting  
Practical  
Useful  
Useless  
Easy  
Easy / simple  
Difficult / hard  
Difficult  
Boring  
practical  
Exciting  
Creative  
Important  
Too  
Very  
Quite

**9.11 My school – vocab. list****Beschreib deine Schuluniform****Ich trage**

eine Jacke/einen Blazer  
einen Pullover  
ein Hemd  
ein T-Shirt  
eine Krawatte/einen Schiips  
einen Rock  
Socken  
eine Hose  
Schuhe  
Strumpfhose  
hässlich  
schön  
(un) bequem  
teuer  
billig  
modisch  
altmodisch

**Describe your school uniform****I wear..**

Blazer  
Jumper  
Shirt  
T-shirt  
Tie  
Skirt  
Socks  
Trousers  
Shoes  
Tights  
Ugly  
Pretty  
(un) comfortable  
Expensive  
Cheap  
Fashionable  
Unfashionable

**Der Schultag**

Ich verlasse die Schule  
Ich gehe zur Schule  
Die Stunden beginnen  
Die Schule ist...zu Ende  
Es dauert  
Die Pause  
Die Mittagspause  
Morgens  
Nachmittags

**The school day**

I leave home  
I go to school  
Lessons start...  
School ends...  
It lasts...  
Break  
Lunch break  
In the morning  
In the afternoon

**Was sind die Schulregeln?**

Man darf(nicht)  
Man kann (nicht)  
Man muss  
Es ist verboten  
Im Unterricht zuhören  
Ein Handy im Klassenzimmer haben  
Schmuck tragen  
Make-up tragen  
Sportschuhe tragen  
Unterricht verpassen  
pünktlich sein  
Kaugummi kauen  
Hausaufgaben machen  
pünktlich sein

**What are the rules?**

You are allowed  
You can('t)  
You must  
it is forbidden  
To listen in class  
To have a phone in class  
To wear jewellery  
To wear make up  
To wear trainers  
To miss lessons  
To be on time  
To chew gum  
To do homework  
To be on time / punctual

**Was möchtest du in der Zukunft machen?**

Ich möchte.....  
Prüfungen bestehen  
gute Noten haben  
eine Lehre machen  
einen Job suchen  
freiwillig arbeiten  
reisen  
Kinder haben  
heiraten  
fahren lernen  
Arzt(-in)  
Lehrer (in)  
Rechtsanwalt (in)  
Mechaniker (in)  
Klempner  
Feuerwehrmann/frau  
Tierarzt(in)  
Friseur/Friseuse  
eine Ausbildung machen

**What do you want to do in the future?**

I would like.....  
To pass my exams  
To get good grades  
To do an apprenticeship  
To look for a job  
To work as a volunteer  
To travel  
To have children  
To get married  
To learn how to drive  
Doctor  
Teacher  
Lawyer  
Mechanic  
Plumber  
Firefighter  
Vet  
Hairdresser  
To training / education



<u>Extra school vocabulary</u>	<u>Extra Schulvokabeln</u>
hilfsbereit	helpful
gemein	mean, cruel, nasty
höflich	polite
schwach	weak
stark	strong
streng	Strict
digital	digital
online	online
richtig	right / correct
draußen	outside
die Aufgabe	exercise / task
die Klasse	class
die Klassenarbeit	school test
die Note	mark / grade
die Regel	rule
die Pause	break
die Prüfung	exam
die Reise	journey / trip
die Schülerin	school student (f)
der Schüler	school student (m)
die Sprache	language
die Stunde	hour, lesson, period
die Tasche	pocket / bag
der/ die Erwachsene	adult / grown-up
das Fach	Subject
das Lieblingsfach	favourite subject
das Mobbing	bullying
das Zeugnis	report
das Klassenzimmer	Classroom
die Ferien	holidays
die Hausaufgaben	homework
lernen	to learn
schreiben	to write
verbessern	to improve
der Ausflug	Trip
der Schulhof	School yard / playground

<u>Buildings</u>	<u>Gebäude</u>
sauber	clean
schmutzig	dirty
die Kantine	canteen
die Toilette	Toilet
das Büro	Office
das Fitness-Studio	Gym
das Theater	Theatre
die Bühne	Stage
Die Turnhalle	Sports hall
die Grundschule	Primary school



### 9.11 My school Knowledge Organiser

School – Subjects, uniform and time  
Future plans & jobs

<u>infinitives</u>	<b>machen</b>	<b>können</b>	<b>RE verb</b>
ich (I)	mache	kann	lerne
du (you)	machst	kannst	lernst
er/sie/man (he/she/one)	macht	kann	lernt
Wir (we)	machen	können	lernen
ihr (you all)	macht	könnt	lernt
Sie (you) /sie (they)	machen	können	lernen

#### The future tense in German

**You can talk about the future** by using the present tense + a future time phrase or use the future tense which is:-

**Use part of the verb werden and the infinitive to say what you are going to do/will do**

*Heute abend spiele ich Tennis. This evening I am going to play tennis.  
Morgen wird Paul Kuchen essen. Tomorrow Paul will eat cake.*

You can also use the following phrases with an infinitive to refer to the future.

*Ich will = I want*

*Ich möchte = I would like*

**Adjectives** describe nouns e.g., a **black** blazer.

In German, adjectives go before the words they are describing e.g., eine blaue Krawatte (a blue tie) and they must agree with the noun they are describing.

Adjectives must agree with the noun (or pronoun) they describe in gender and in number.

This means that if the noun an adjective describes masculine, the adjective must be masculine e.g., einen schwarzen Blazer (a black blazer).

If the noun is plural, the adjective will be plural as well e.g., schwarze Socken (black socks).

**Comparatives – to express more or less than**

Add 'er' to the adjective, but in words of more than 1 syllable an umlaut is sometimes added too. You must also add **als = than**

klein = kleiner (smaller) lang = länger

wichtig = wichtiger (more important)

Mathe ist interessanter als Deutsch

mehr = more/weniger = fewer/besser = better





## Year 9 German – Festivals and Traditions

<b>Celebration /Festivals</b>	<b>Celebrations/Festivals</b>
der Aschermittwoch	Ash Wednesday
der Karfreitag	Good Friday
der Karneval/der Fasching	Carnival/Carnival
der Maifeiertag	May Day
der Mutterstag	Mother's Day
Ostern	Easter
Pfingsten	Whitsun
Tag der Deutschen Einheit	Day of German Unity
der Valentinstag	Valentine's Day
Geburtstag/Halloween	Birthday/Halloween
der Neujahrstag	New Year's Day
Silvester	New Year's Eve
der Aprilscherz	April Fool's Day

**Key vocab**  
 die Einladung  
 die Feier/das Fest  
 die Festlichkeit  
 der Feiertag  
 die Tradition/kirchlich  
 die Moschee  
 die Fastenzeit  
 die Umzüge/die Wagen  
 der Osterhase/ das Osterei  
 das Feuerwerk  
 die Kerze/das Licht  
 der Gast/der Gastgeber/die Menge  
 die Geschenke  
 die Zuckertüte  
 die Gastfreundschaft  
 die Party/Das Straßenfest

**Key vocab**  
 Invitation  
 Celebration/Festival or celebration  
 Celebration  
 Public holiday  
 Tradition/religious  
 Mosque  
 Period of fasting/Lent  
 Processions/floats  
 Easter bunny/Easter egg  
 Fireworks  
 Candle/light  
 Guest/host/crowd  
 Presents  
 Cone filled with sweets  
 Hospitality  
 Party /street party

<b>Key Vocab</b>	<b>Key phrases</b>
München	Munich
Köln	Cologne
Berliner Pfannkuchen	Sweet doughnut
das Oktoberfest	October Beer festival
Scherze/Streiche	Jokes/tricks
die Hexe	Witch
das Kostüm	Costume
das Volksfest	Public festival
die Besucher	Visitors
der Grillabend	barbecue

<b>Key Question words</b>	<b>Key Question words</b>
Wann?	When?
Warum?	Why?
Wer	Who?
Wie?	How?
Was?	What?
Was für?	What sort of?
Wo?	Where?
Wohin?	Where to?
Woher?	Where from?
Wozu?	What for? Why?
Wieso?	Why? How come?
Wie viel?	How much?
Wie viele?	How many?

<b>Key verbs in infinitive</b>	<b>Key verbs in infinitive</b>
bekommen	to get/to receive
danken	to thank
einladen	to invite
feiern	to celebrate
sich verkleiden	to dress up
besuchen	to visit
teilnehmen	to take part
stattfinden	to take place
dauern	to last
freuen (sich auf)	to look forward to
freuen (sich über)	to be pleased about sthg
schmücken	to decorate
verstecken /schicken	to hide/to send

**Weihnachten**  
 der Adventskranz  
 der Weihnachtsbaum  
 die Weihnachtslieder  
 Heiliger Abend  
 Erste Weihnachtstag  
 Zweite Weihnachtstag  
 der Lebkuchen  
 austauschen  
 der Sankt Nikolas Tag  
 Gänsebraten/ der Rotkohl

**Christmas**  
 Advent wreath  
 Christmas tree  
 Christmas carols  
 Christmas Eve  
 Christmas Day  
 Boxing Day  
 Gingerbread  
 To exchange  
 St Nicholas' Day (6th Dec)  
 Roast goose/red cabbage



Context

1960's and 70's Britain is often regarded as a period of revolution and change. During this topic we are going to assess how much change occurs during this time period for LGBTQ+, women and Black people.

Key Events

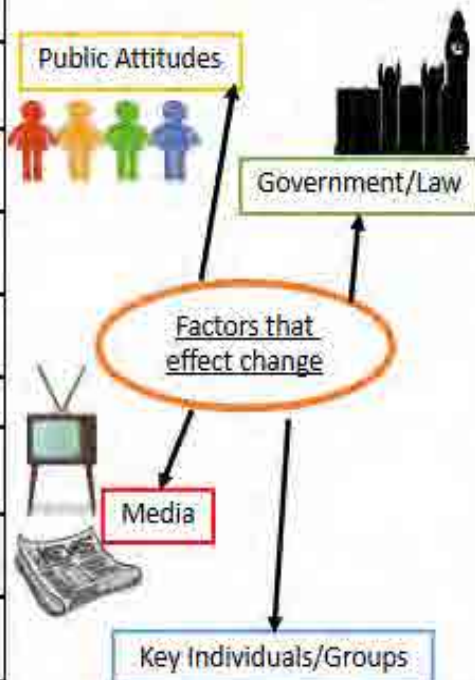
1	<b>1961</b> – The <b>Contraceptive pill</b> available for married women for the first time on the NHS.
2	<b>30<sup>th</sup> April – 17<sup>th</sup> September 1963</b> – <b>Bristol Bus Boycott</b> took place to challenge discrimination on Bristol's buses.
3	<b>1965</b> – <b>Race Relations Act</b> passed, first law to ban racial discrimination in public places and made it a criminal offence.
4	<b>1967</b> – <b>Sexual Offences Act</b> was passed which decriminalised private homosexual acts between men aged over 21.
5	<b>1967</b> – <b>Family Planning Act</b> passed, contraception available to all through the NHS.
6	<b>1968</b> – The first <b>St Pauls Carnival</b> took place in Bristol.
7	<b>7<sup>th</sup> June 1968</b> – 187 women sewing machinists at the Ford Motor Company plant in <b>Dagenham</b> , Essex, went on strike.
8	<b>9 August 1970</b> – Black Power activists march against police harassment of the Black community in Notting Hill, London.
9	<b>1 July 1972</b> - First <b>Pride march</b> took place in the UK, approximately 2000 protesters marched in <b>London</b> .



History – Year 9  
Knowledge  
Organiser  
Term 5



How much did life change for LGBTQ+, women and Black people during the 1960's and 70's?

Key Terms

10	activism	Any action of campaigning to bring about change. Usually social or political change.
11	civil rights	The rights of citizens to political and social freedom and equality.
12	decriminalisation	To no longer to treat something as illegal or as a criminal offence.
13	equality	The state of being equal, especially in status, rights, or opportunities.
14	legalisation	To make something that was previously illegal allowed by law.
15	liberation	To set someone or something free. For example from oppression.
16	revolution	To overthrow a government or social order, in favour of a new system.
17	Second Wave Feminism	Feminists who sought to change social and sexual discrimination.

Key Skills

18	Change and continuity.	What changed and continued, stayed the same, for each group during the 60's and 70's? Why? How quickly did things change? To what extent did they change?
----	------------------------	---





# SEQUENCES

## KEY CONCEPTS

**Arithmetic sequences**  
increase or decrease  
by a common amount  
each time.

**Quadratic sequences**  
have a common 2<sup>nd</sup>  
difference.

**Fibonacci sequences**  
Add the two previous  
terms to get the next  
term

**Geometric series** has  
a common multiple  
between each term

## Linear sequences:

4, 7, 10, 13, 16.....

a) State the nth term

$3n + 1$   
Difference      The 0<sup>th</sup> term

## Examples

b) What is the 100<sup>th</sup> term  
in the sequence?

$$3n + 1$$

$$3 \times 100 + 1 = 301$$

c) Is 100 in this sequence?

$$3n + 1 = 100$$

$$3n = 99$$

$$n = 33$$

Yes as 33 is an integer.

## Quadratic sequences:

$a + b + c$	3	9	19	33	51
$3a + b$	6	10	14	18	
$2a$	4	4	4		

First difference

Second difference

$$2a = 4 \quad 3a + b = 6 \quad a + b + c = 3$$

$$a = 2 \quad 3 \times 2 + b = 6 \quad 2 + 0 + c = 3$$

$$b = 0 \quad c = 1$$

$$2n^2 + 0n + 1 \rightarrow 2n^2 + 1$$

## Key Words

Linear  
Quadratic  
Arithmetic  
Geometric  
Sequence  
Nth term

A) 1, 8, 15, 22, ....

1) Find the nth term      b) Calculate the 50<sup>th</sup> term      c) Is 120 in the sequence?

B) Find the nth term for:

1) 5, 12, 23, 38, 57, ...      2) 3, 11, 25, 45, 71, ....

ANSWERS: A1)  $7n - 6$  2) 344 3) 18 so yes as n is an integer B1)  $2n^2 + n + 2$  2)  $3n^2 - n + 1$



# PLOTTING AND INTERPRETING GRAPHS

## Key Concept

**Substitution** – This is where you replace a number with a letter  
If  $a = 5$  and  $b = 2$

$a + b =$	$5 + 2 = 7$
$a - b =$	$5 - 2 = 3$
$3a =$	$3 \times 5 = 15$
$ab =$	$5 \times 2 = 10$
$a^2 =$	$5^2 = 25$

## Key Words

**Intercept:** Where two graphs cross.

**Gradient:** This describes the steepness of the line.

**y-intercept:** Where the graph crosses the y-axis.

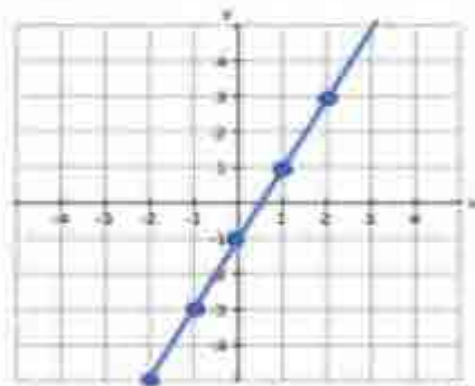
**Linear:** A linear graph is a straight line.

**Quadratic:** A quadratic graph is curved, u or n shape.

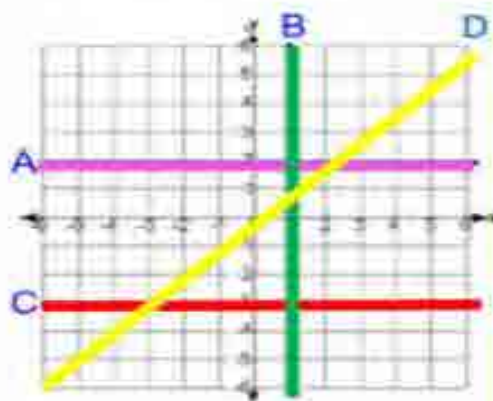
## Examples

Draw the graph of  $y = 2x - 1$

x	-2	-1	0	1	2
y	-5	-3	-1	1	3



Notice this graph has a gradient of 2 and a y-intercept of -1.



A:  $y = 2$     B:  $x = 1$

C:  $y = -3$     D:  $y = x$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Example

$$m = \frac{5 - 1}{4 - 2} = \frac{4}{2} = 2$$



## QUESTIONS

1) What are the gradient and y-intercept of:

a)  $y = 4x - 3$

b)  $y = 4 + 6x$

c)  $y = -5x - 3$

2) Draw the graph of  $y = 3x - 2$  for x values from -3 to 3 using a table.

c)  $m = -5, c = -3$

b)  $m = 6, c = 4$

a)  $m = 4, c = -3$

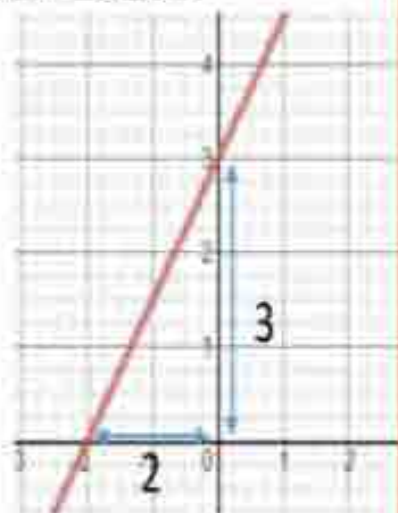
ANSWERS: 1)

# REARRANGE AND SOLVE EQUATIONS

## Gradient

**Gradient** or **m** is a measure of the steepness of a line. The higher the value of **m**, the steeper the line.

### Gradient from a graph



$$m = \frac{\text{change in } y}{\text{change in } x}$$

$$m = \frac{3}{2}$$

$$y\text{-coordinate} \rightarrow y = mx + c \leftarrow \text{intercept}$$

$\nearrow$  gradient       $\nwarrow$  x-coordinate

## Intercept

The **intercept** or **c** is the y-value where the line crosses the y-axis.

### Gradient from two points

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

#### Example:

Find the gradient of the line segment between (2, -3) and (6, 9).

$$\frac{9 - (-3)}{6 - 2}$$

So the gradient of this line segment is 3.

### Parallel and Perpendicular

Two lines are **parallel** if they have the same gradient.

#### Example:

Give the equation of a line which is parallel to  $y = 5x + 1$ .

The answer to this is any line with equation  $y = 5x + a$ , where  $a$  is any number apart from +1, for example  $y = 5x + 4$ ,  $y = 5x - 2$ ,  $y = 5x + 100$

Two lines are **perpendicular** if their gradients have a product of -1.

#### Example:

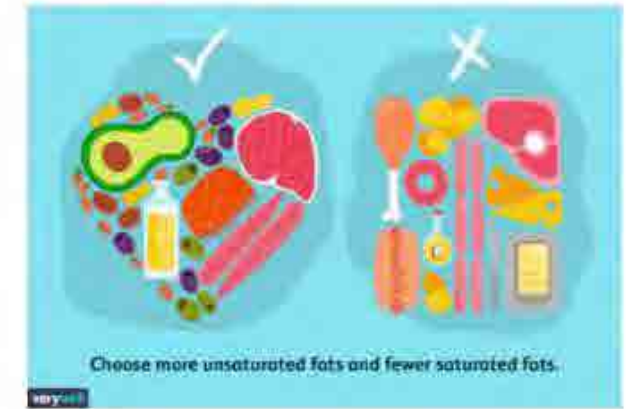
The answer to this would be any line with a gradient of -2 as  $-2 \times \frac{1}{2} = -1$ , for example  $y = -2x - 2$ ,  $y = -2x + 22$





Carbohydrates are used within energy production

Fats also assist in energy production but also insulate the body



Protein is used for muscle growth and repair

### SOURCES OF DIETARY FIBRE



Vitamins are important for prevention of disease and functioning of our metabolism. Minerals are essential for health and chemical reactions in our body

### PLANT BASED PROTEIN

CHICKPEAS	OATS	TOFU
7g protein	11g protein	13g protein
BROWN RICE	QUINOA	LENTILS
3g protein	4g protein	6g protein
CASHEWS	PEANUT BUTTER	ALMONDS
18g protein	28g protein	25g protein
AVOCADO	BROCCOLI	EDAMAME
2g protein	4g protein	12g protein

\*Some incomplete proteins.

### ANIMAL BASED PROTEIN

EGGS	TURKEY MINCE	CHICKEN BREAST
14g protein	25g protein	25g protein
FRANKS	TUNA	SALMON
18g protein	25g protein	25g protein
PORK CHOP	REEVE	DUCK
19g protein	19g protein	27g protein
SWISS CHEESE	GREEK YOGURT	EDAM CHEESE
4g protein	9g protein	25g protein

\*All complete proteins.

Fibre supports the digestive system

### Vitamins and Minerals





# Changemakers: How does belief inspire change? Knowledge Organiser

## NEED TO KNOW WORDS

Activism	The use of action to bring about change
Civil Rights	Political and social equality and freedom
Civil Disobedience	refusal to comply with certain laws
Democracy	A publicly elected government
Racism	To discriminate against people of a certain race
Equality	A state of being equal
Social Justice	Fair distribution of wealth and rights in a society
Prejudice	Prejudged opinions of a person or group
Discrimination	Unfair treatment of a group

## What is activism?

The word "activism" is only about 100 years old, at least in its current use, and derives from the verb to act. An activist is someone who is active in campaigning for change, normally on political or social issues. Activism is what activists do, that is, the methods they use in order to bring about change. Human rights activism is thus about reacting to injustice, to abusive treatment, to violence or discrimination, and trying to correct it.

### Christian views on prejudice and discrimination

Christians believe that all humans are made in the image of God. Therefore any action that devalues a person is an insult to God who created and loves that person:

*'Love your neighbour as yourself:' - Matthew 22:39*

### Islamic views on prejudice and discrimination

Islam teaches that God created everyone as equal but different. As all are created by God, discrimination against any human is unjustified. The ummah crosses all gender, race and wealth boundaries:

*"All human beings are equal like the teeth of a comb." - Hadith*

### Social Justice – Malcolm X

Malcolm X was an important leader who fought against racism and worked to empower Black people in the United States. He believed that Black people should have control over their own lives and communities, and he criticized the way that mainstream civil rights leaders were approaching the issue. He contributed to social justice by:

- Promoting Black independence and challenging the idea of white superiority.
- Advocating for Black economic and political power through initiatives such as Black nationalism and separatism.
- Highlighting the impact of systemic racism and institutional discrimination on the Black community.

## Examples of Activism

Demonstrations and protests	During a demonstration or a protest, people united by a common belief meet together. They might march along a specific route, sit in at a specific place to draw attention to the cause, or hold a vigil to honour someone's life
Boycotts	to refuse to buy a product or take part in an activity as a way of expressing strong disapproval
Strikes	When workers deal with unfair or dangerous work conditions, low wages, or other issues, they might refuse to work when negotiations are refused or they fail.
Social media campaigns	Also known as "hashtag activism," it brings activism to social media networks like Instagram and Twitter. Users raise awareness of issues, organizations, and actions through posts, graphics, videos, and more.



# Changemakers: How does belief inspire change? Knowledge Organiser

NEED TO KNOW WORDS	
Conviction	A firmly held belief or opinion
Marginalised	individuals or groups who are excluded from mainstream society
March on Washington	the historic civil rights march on Washington D.C. on August 28, 1963, where Martin Luther King Jr. delivered his famous "I Have a Dream" speech.
LGBTQ+ rights	equal rights and protections of LGBTQIA+ individuals

Racism– Martin Luther King Jr	
Martin Luther King Jr. was a famous civil rights leader who fought for racial equality and social justice in the United States during the mid-20th century.	
<b>Influence of Beliefs:</b> Christian beliefs strongly influenced his activism and his vision for social justice. He saw the struggle for civil rights as a moral issue, and he believed that all people were created equal in the eyes of God. He emphasised the importance of love and nonviolence in the struggle for justice, drawing on Jesus' teachings in the New Testament.	<b>Contributions to change</b> <ul style="list-style-type: none"> <li>Advocating for nonviolent protests to challenge racial discrimination and segregation.</li> <li>Leading the Montgomery Bus Boycott and the <b>March on Washington</b>, which brought national attention to the Civil Rights movement.</li> <li>Promoting racial equality and the end of segregation through the Civil Rights Act of 1964 and the Voting Rights Act of 1965.</li> </ul>

Education – Malala Yousafzai	
Malala Yousafzai is a Pakistani education activist who has become a prominent voice for girls' education and women's rights.	
<b>Influence of Beliefs:</b> Malala Yousafzai is a Muslim, and her faith has played a significant role in inspiring her activism for girls' education and women's rights. She drew on the example of Prophet Muhammad, who taught that seeking knowledge was a duty for both men and women, to inspire her own advocacy for girls' education.	<b>Contributions to change</b> <ul style="list-style-type: none"> <li>Advocating for girls' education in Pakistan.</li> <li>Co-founding the Malala Fund to promote girls' education around the world</li> <li>Speaking out on a variety of global issues, including refugees, climate change, and social justice.</li> </ul>

LGBTQ+ – Marsha P Johnson	
Marsha P. Johnson was a Black transgender woman and LGBTQ+ rights activist who fought for justice and equality for marginalized communities.	
<b>Contributions to change</b> <ul style="list-style-type: none"> <li>Being a prominent figure in the Stonewall uprising of 1969, which is widely considered a turning point in the fight for LGBTQ+ rights</li> <li>Co-founding the Street Transvestite Action Revolutionaries (STAR) which provided housing and support to homeless transgender youth.</li> <li>Challenging traditional gender norms.</li> <li>Promoting the idea that all people should be free to express their true selves.</li> </ul>	<b>Impact on religion:</b> Marsha P. Johnson's legacy has inspired many religious communities to re-examine their traditional teachings on gender and sexuality. Some religious organizations have even begun to recognize and celebrate the lives of LGBTQ+ figures like Marsha P. Johnson as part of their own religious traditions, highlighting the intersections between faith and social justice.

# Changemakers: How does belief inspire change? Knowledge Organiser

## NEED TO KNOW WORDS

### Speciesism

The belief that one species, typically humans, is superior to and has the right to dominate over other species

### Climate change

Refers to the long-term changes in the Earth's climate primarily due to human activities such as burning fossil fuels and deforestation.

### Ummah

the global community of Muslims

## Christian views on Activism

Many Christians believe that they are called to work for justice and to serve others, based on the teachings of Jesus Christ. They see activism as a way to live out their faith and to make a positive impact in the world. This can take many different forms, including political advocacy, social justice work, and community service.

At the same time, many Christians also believe in the importance of prayer, worship, and spiritual reflection as a way to sustain their activism and to remain connected to God's guidance and wisdom. They see activism as part of a larger spiritual journey, and they believe that their faith can provide strength and inspiration for their work.

## Speciesism – Peter Singer

Peter Singer is a philosopher and ethicist who is known for his work in animal rights

### Contributions to change

- Criticizing the use of speciesism, or the belief that humans are superior to other animals, as a justification for the exploitation and mistreatment of non-human animals.

### Significance

Peter Singer's secular humanist worldview has led him to be a strong advocate for the rights and well-being of all beings, and has inspired many people to re-examine their own ethical beliefs and values.

## Climate – Extinction Rebellion

a global environmental movement that aims to raise awareness about the climate crisis and the urgent need for action to prevent further damage to the planet.

### Aims:

To pressure governments and other institutions to take immediate action to address the climate crisis, including reducing carbon emissions, transitioning to renewable energy, and protecting biodiversity. XR also advocates for systemic change that would move away from a fossil fuel-based economy and toward a sustainable and just society.

### Activism:

The methods used by XR include nonviolent civil disobedience, such as blocking roads and disrupting public spaces, as well as other forms of protest and direct action. The movement believes that such tactics are necessary to draw attention to the urgency of the climate crisis and to pressure those in power to take action.

## Islamic views on Activism

In Islam, the concept of social justice is central, and Muslims believe that they have a responsibility to work for the betterment of society and to alleviate the suffering of those in need. This can take many forms, including political activism, social welfare work, and community service.

Muslims also believe in the importance of prayer and worship as a way to connect with God and to seek guidance and inspiration for their work. They see activism as a way to live out the principles of their faith and to embody the teachings of the Prophet Muhammad.



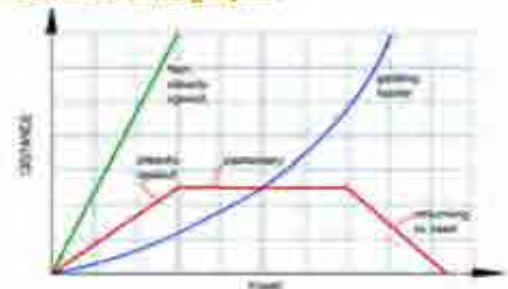
Vector	Scalar
A property with magnitude (size) & direction.	A property with magnitude (size) only.
Velocity	Speed
Displacement	Distance
Weight	Mass
Acceleration	
Force	

**Average speed** is calculated using this equation:

$$\text{Speed (m/s)} = \frac{\text{total distance (m)}}{\text{total time (s)}}$$



**Distance-time graphs:**



**Acceleration:** units:  $\text{m/s}^2$ . Speeding up or slowing down. Two equations to learn:

$$v - u = a \times t$$



$a$  = acceleration  
 $v$  = final velocity  
 $u$  = initial velocity  
 $t$  = time taken

And:

$$v^2 - u^2 = 2 \times a \times s$$

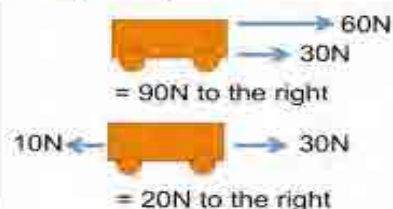
Where  $s$  = distance.

Slowing down is negative acceleration, **not** deceleration.

**Velocity-time graph:** Area under the line = distance travelled.



**Resultant forces:** Forces acting on an object can be added together to give the resultant force. Remember some forces are **negative** because force is a **vector**. Horizontal and vertical forces must be treated separately.



**Newton's First Law:** An moving object will continue to move at the same velocity (speed and direction) until acted on by a resultant force.

Or:

A stationary object will remain at rest until acted on by a resultant force.

**H – Circular motion:** An object moving in a circle is constantly changing direction. Change in direction means change in velocity, and therefore the object is accelerating (positive or negative) even if its speed does not change. This means a force is required to keep the object moving in a circle. This force is called the **centripetal force**.



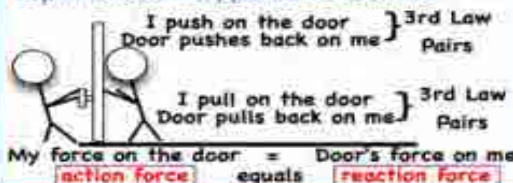
**Newton's Second Law:**

Force = mass x acceleration

$$F = m \times a$$



**Newton's Third Law:** Two objects interacting with one another experience equal forces in opposite directions.



Mass	Weight
How much matter there is.	The force of gravity acting on the mass.
Same regardless of location.	Changes depending on location (e.g., different planets).
Measured in kilograms (kg).	Measured in Newtons (N).
Scalar (size only).	Vector (size and direction).
Weight = mass x gravitational field strength $W = m \times g$ On Earth, $g = 10 \text{ N/kg}$ .	

**H – Momentum:** A measure of how hard it is to stop an object moving. Vector. Units:  $\text{kg.m/s}$ .

$$\text{Momentum} = \text{mass} \times \text{velocity}$$

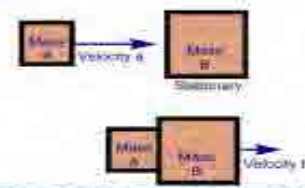
$$p = m \times v$$

To change the momentum of an object, a resultant force is needed:

$$\text{Force} = \frac{\text{Change in momentum}}{\text{time}}$$

$$F = \frac{mv - mu}{t}$$

Collision between two objects: The total momentum is conserved before and after the collision.

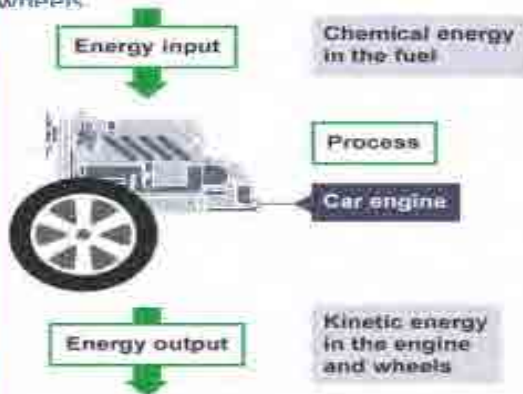




**Energy stores:** Energy is stored in different ways.

- **Chemical energy:** Stored in chemical form, e.g.: food, fuel (e.g. petrol), batteries.
- **Kinetic energy:** Stored in moving objects, e.g. car, train, sprinter.
- **Thermal energy:** Stored as heat, e.g.: hot water.
- **Elastic potential energy:** Stored in stretched materials, e.g.: springs, rubber bands.
- **Gravitational potential energy:** Stored in objects raised a height above ground, e.g. a ball held above the ground.
- **Nuclear energy:** Stored inside atoms.

**Conservation of energy:** Energy cannot be created or destroyed. It can only be transferred from one store to another. For example, a car transfers energy from the chemical store (fuel) to the thermal store (in the engine) and then to the kinetic store (in the wheels). The total amount of energy stays constant. This is the **law of conservation of energy**. Some of the energy is transferred to the thermal store as friction and not to the kinetic store in the wheels.



**Energy:** Energy is a body's capability to have an effect on its surroundings. For example: A hot cup of tea will heat the air around it and the table top it sits on. Units: Joules (J).

**Stopping distance = thinking distance + braking distance.**

**Thinking distance:**

- The distance travelled in the time between the driver seeing the situation and reacting.
- Affected by: tiredness; drugs; alcohol; illness; distractions (e.g. using a mobile phone).

**Braking distance:**

- The distance travelled while the brakes are applied.
- Slows the car down by friction.
- Affected by: Road conditions (e.g. loose gravel, wet); tyre conditions; weight of the vehicle.

**Crash hazards:** Rapid acceleration (positive or negative) – like in a car crash – is dangerous to the human body. Cars have **crumple zones** where the engine compartment crumples in a crash, increasing the time over which the impact takes place. This reduces the size of the acceleration felt by the passengers.

**Energy diagrams:**

Energy transfers between energy stores can be represented by Sankey diagrams.

In a Sankey diagram, the width of the arrow represents the amount of energy transferred. The arrow splits into different directions for transfers to different energy stores.

The Sankey diagram opposite shows energy transfers in a filament light bulb. It shows that most of the energy is wasted as heat.

**Transferring heat:** Heat is transferred in various ways:



**Kinetic energy** =  $\frac{1}{2} \times \text{mass} \times (\text{velocity})^2$

$$KE = \frac{1}{2} \times m \times v^2$$

**Gravitational potential energy** = mass x gravitational field strength x height

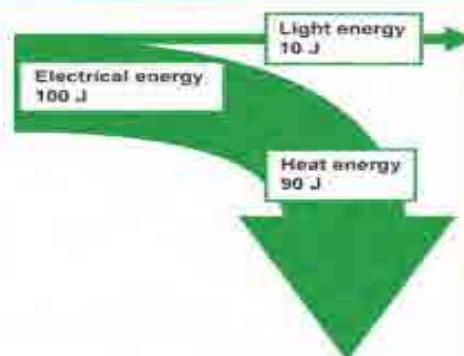
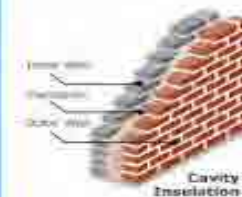
$$GPE = m \times g \times h$$

**Non-renewable resources** include coal, oil and gas, known as fossil fuels. When burnt they release carbon dioxide and other gases, which contribute to climate change. Nuclear fuel (uranium) is also non-renewable but contributes less to climate change. Instead it leaves nuclear waste, which remains dangerous for thousands of years.

**Renewable resources** include solar cells, hydroelectricity, wind turbines and tidal power. Renewable resources will not run out. They do not generate carbon emissions. Renewable resources are being increasingly used as they become cheaper and as non-renewable resources begin to run out. Bio-fuels are made from animal waste or plants. They are burned to generate energy.

**Keeping warm:** It is difficult to keep a house warm because heat energy tends to spread. Insulation stops heat spreading.

Cavity wall insulation reduces heat loss because the air gaps stop heat energy being conducted from inside to outside.



**Energy efficiency:** Energy cannot be created or destroyed. Some energy is transferred to the useful store (light in the case of the lightbulb). Some of the energy is transferred to a different store and is wasted (heat in the case of the lightbulb).

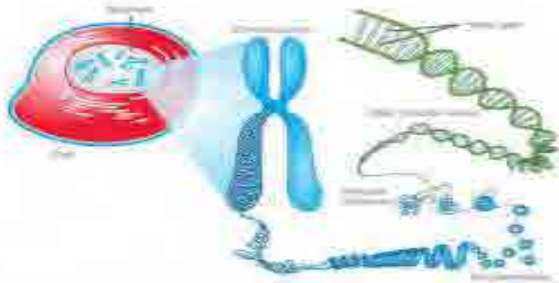
$$\text{Efficiency} = \frac{\text{Useful energy transferred by the device}}{\text{Total energy transferred by the device}}$$

A lightbulb which consumes 100 J of electrical energy and outputs 10 J of light energy has an efficiency of 0.10.



**DNA (Pg 27)**

- **DNA** is the genetic material contained in the **nucleus** of a cell
- The entirety of the human DNA is called the **genome**.
- DNA is contained within the chromosomes inside the nucleus.
- It has a **double helix** shape.

**Base pairs (Pg 27)**

- Four base pairs:
  - A (adenine)
  - T (thymine)
  - C (cytosine)
  - G (guanine)
- Base pairs are bonded together with **hydrogen bonds**
- **A always bonds with T, C always bonds with G**
  - These are known as **complementary base pairs**
- Each base is attached to a **sugar** and **phosphate** backbone. Together these are known as a **nucleotide**.

DNA is a polymer made of many monomers, called **nucleotides**, joined together.

**Extracting DNA (Pg 27)**

1. Mix washing up liquid (**breaks down cell membranes**) and salt (**clumps DNA together**)
2. Mash fruit (**breaks up cells**)
3. Filter (**separates solid lumps of fruit and the now dissolved DNA**)
4. Gently add ice-cold ethanol (**DNA is insoluble in ethanol, so precipitates out to be collected**).

**Genes & Alleles (Pg 28)**

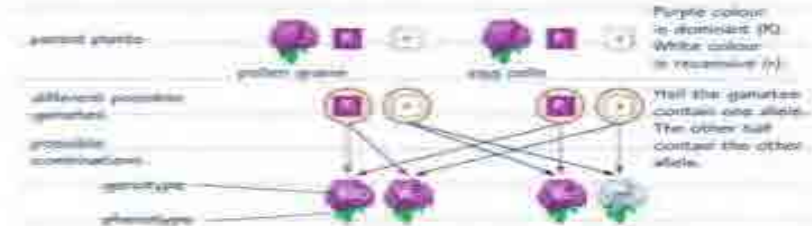
- Genes are short lengths of DNA that code for a specific protein.
- This means they control certain features (e.g. eye colour)
- Alleles are different versions of the same gene (e.g. blue eye gene or brown eye gene.)
- You have two alleles for each gene, one from Mum and the other from Dad.
- Alleles can be dominant (use a capital letter) or recessive (use a lower-case letter)
  - Aa

**Genetics keywords (Pg 28)**

Key word	Definition
Gene	A section of DNA that codes for one thing.
Allele	A different version of the same gene.
Offspring	The 'children' of an organism.
Dominant	The stronger allele.
Recessive	The weaker allele.
Homozygous	Having 2 of the same allele.
Heterozygous	Having 2 different alleles.
Genotype	The different alleles that an organism has e.g. Rr
Phenotype	The characteristic the organism has. E.g. purple flowers

**Genetic diagrams (Pg 28)**

- Used to predict the possible outcomes of a cross depending on the parents' genotypes.
- Two kinds



- Punnett squares are easier to use

		Father's genotype	
		R	r
Mother's genotype	R	RR	Rr
	r	Rr	rr

EDEXCEL 9-1 Combined Science | **Biology Topic 3 – Genetics** | Required Knowledge

CPG F &amp; H tier: pages 6, 28-31

**Probabilities (Pg 28)**

- Possible outcomes are represented as probabilities.

Parents' genotypes:

	R	r
R	RR	Rr
r	Rr	rr

- $RR = 1/4 = 25\% = 0.25$
- $Rr = 2/4 = 50\% = 0.50$
- $rr = 1/4 = 25\% = 0.25$

**Sex determination (Pg 29)**

- The sex of a child dependent on the 23<sup>rd</sup> pair of chromosomes (either X or Y)
  - XX = woman
  - XY = Man
- Use a Punnett square to show the probability of having a boy or girl.

Parents' sex chromosomes:

	X	Y
X	XX	XY
Y	XY	YY

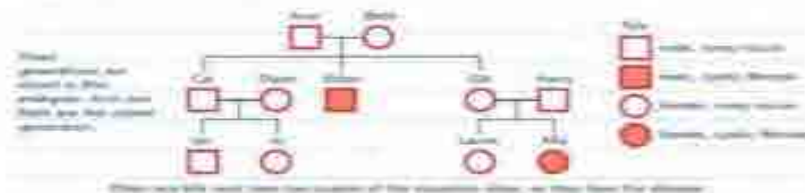
- $XX = 2/4 = 50\%$  chance girl
- $XY = 2/4 = 50\%$  chance of boy

**Variation (Pg 30)**

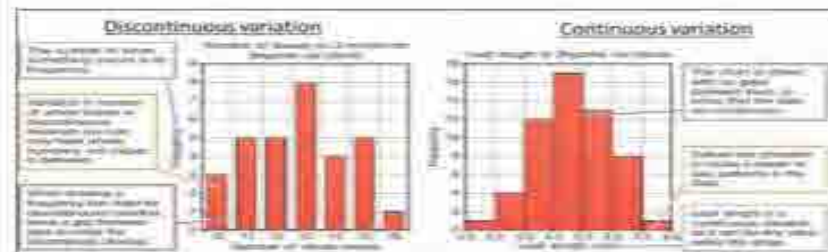
- Differences in the same species is known as **variation**.
- Variation can be **inherited** from parents (e.g. eye colour)
- Variation can be **environmental** (e.g. a scar or tattoo)
- Variation can be a combination of **both** inheritance and environment. (e.g. weight)

**Pedigree charts (Pg 29)**

- Used to track genetic disorders which can be passed from parent to child.
- Parents can be carrier of the gene that causes the disease but not suffer with the disease.

**Studying variation (Pg 6)**

- Data gathered can be either continuous (data can be any value in a range) or discontinuous (data can only take on a limited number of values)
- Plotted on bar graphs with differences in how each is plotted.

**Mutation (Pg 30)**

- Mutations are caused by changes to the original DNA code in an organism.
- Mutations can cause changes in phenotype if the code of certain genes is changed.
- These changes to specific genes bring about different alleles.
- Mostly mutation cause no change to phenotype at all.

**Human Genome Project (Pg 31)**

- Complete map of the human genome.
- Decoding the base pairs making up all the genes in our DNA.
- Took 13 years to complete.
- Advantages
  - Predicting and preventing inherited diseases (see if genes known to interact to cause like heart disease or cancer present – make changes to lifestyle accordingly)
  - Testing and treatment for inherited disorders (look to see if disease exists before baby is born)
  - Development of new drugs where known interactions between drugs and genes is known.
- Disadvantages
  - Stress/worry (if you possess a known disease gene)
  - Gene-ism (people pressured not to have a baby if they have a known gene)
  - Discrimination (people with known genes prevented from getting jobs or health insurance)

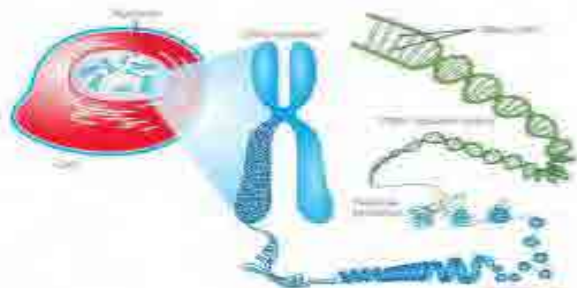


## EDEXCEL 9-1 Separate Science | Biology Topic 3 – Genetics | Required Knowledge

CPG Biology: pages 34 &amp; 38.

**DNA (Pg 34)**

- **DNA** is the genetic material contained in the **nucleus** of a cell
- The entirety of the human DNA is called the **genome**.
- DNA is contained within the chromosomes inside the nucleus.
- It has a double helix shape.

**Base pairs (Pg 34)**

- Four base pairs:
  - A (adenine)
  - T (thymine)
  - C (cytosine)
  - G (guanine)
- Base pairs are bonded together with **hydrogen bonds**
- **A always bonds with T, C always bonds with G**
  - These are known as complimentary base pairs
- Each base is attached to a **sugar** and **phosphate** backbone. Together these are known as a **nucleotide**.

DNA is a polymer made of many monomers, called nucleotides, joined together.

**Extracting DNA (Pg 34)**

1. Mix washing up liquid (**breaks down cell membranes**) and salt (**dumps DNA together**)
2. Mash fruit (**breaks up cells**)
3. Filter (**separates solid lumps of fruit and the now dissolved DNA**)
4. Gently add ice-cold ethanol (**DNA is insoluble in ethanol, so precipitates out to be collected**).

**Genes & Alleles (Pg 38)**

- Genes are short lengths of DNA that code for a specific protein.
- This means they control certain features (e.g. eye colour)
- Alleles are different versions of the same gene (e.g. blue eye gene or brown eye gene.)
- You have two alleles for each gene, one from Mum and the other from Dad.
- Alleles can be dominant (use a capital letter) or recessive (use a lower-case letter)
  - Aa

**Genetics keywords (Pg 38)**

Key word	Definition
Gene	A section of DNA that codes for one thing.
Allele	A different version of the same gene.
Offspring	The 'children' of an organism.
Dominant	The stronger allele.
Recessive	The weaker allele.
Homozygous	Having 2 of the same allele.
Heterozygous	Having 2 different alleles.
Genotype	The different alleles that an organism has e.g. Rr
Phenotype	The characteristic the organism has. E.g. purple flowers

**Genetic diagrams (Pg 38)**

- Used to predict the possible outcomes of a cross depending on the parents' genotypes.
- Two kinds



- Punnett squares are easier to use

		Father's genotype	
		R	r
Mother's genotype	R	RR	rR
	r	Rr	rr

EDEXCEL 9-1 Separate Science | **Biology Topic 3 – Genetics** | Required Knowledge

CPG Biology: pages 6, 38-39, 42-43.

**Probabilities (Pg 38)**

- Possible outcomes are represented as probabilities.



- $RR = 1/4 = 25\%$
- $Rr = 2/4 = 50\%$
- $rr = 1/4 = 25\%$

**Sex determination (Pg 39)**

- The sex of a child dependent on the 23<sup>rd</sup> pair of chromosomes (either X or Y)
  - XX = woman
  - XY = Man
- Use a Punnett square to show the probability of having a boy or girl.



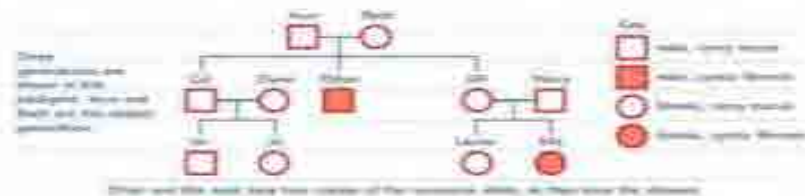
- $XX = 2/4 = 50\%$  chance girl
- $XY = 2/4 = 50\%$  chance of boy

**Variation (Pg 42)**

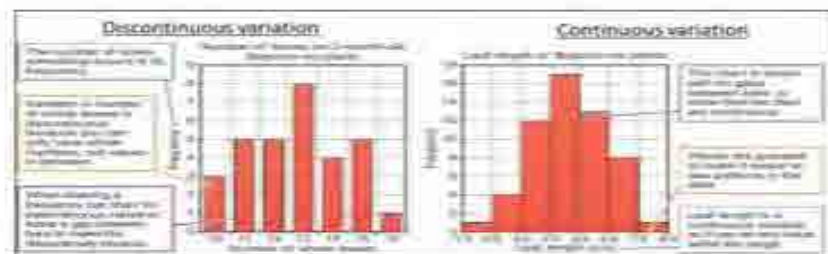
- Differences in the same species is known as **variation**.
- Variation can be **inherited** from parents (e.g. eye colour)
- Variation can be **environmental** (e.g. a scar or tattoo)
- Variation can be a combination of **both** inheritance and environment. (e.g. weight)

**Pedigree charts (Pg 39)**

- Used to track genetic disorders which can be passed from parent to child.
- Parents can be carrier of the gene that causes the disease but not suffer with the disease.

**Studying variation (Pg 6)**

- Data gathered can be either continuous (data can be any value in a range) or discontinuous (data can only take on a limited number of values)
- Plotted on bar graphs with differences in how each is plotted.

**Protein synthesis (Pg 35)**

- Order of the bases in a gene codes for specific amino acids (three bases pairs – a triplet) codes for one amino acid)
- Amino acids in a specific order form a specific protein.

**Mutation (Pg 42)**

- Mutations are caused by changes to the original DNA code in an organism.
- Mutations can cause changes in phenotype if the code of certain genes is changed.
- These changes to specific genes bring about different alleles.
- Mostly mutation cause no change to phenotype at all.

**Human Genome Project (Pg 43)**

- Complete map of the human genome.
- Decoding the base pairs making up all the genes in our DNA.
- Took 13 years to complete.
- Advantages
  - Predicting and preventing inherited diseases (see if genes known to interact to cause like heart disease or cancer present – make changes to lifestyle accordingly)
  - Testing and treatment for inherited disorders (look to see if disease exists before baby is born)
  - Development of new drugs where known interactions between drugs and genes is known.
- Disadvantages
  - Stress/worry (if you possess a known disease gene)
  - Gene-ism (people pressured not to have a baby if they have a known gene)
  - Discrimination (people with known genes prevented from getting jobs or health insurance)



## EDEXCEL 9-1 Separate Science | Biology Topic 3 – Genetics | Required Knowledge

CPG Biology: pages 36-37, 40-41.

**Transcription & translation (Pg 36)**

- Proteins made in two stages

**Transcription**

- Uses mRNA to read the code on the DNA strand
- Base pair Uracil (U) instead of thymine (T)

- 1) **RNA polymerase** binds to a region of **non-coding DNA** in front of a gene.
- 2) The two DNA strands **unzip** and the RNA polymerase **moves along** one of the strands of the DNA.
- 3) It uses the **coding DNA** in the **gene** as a **template** to make the **mRNA**. **Base pairing** between the DNA and RNA ensures that the mRNA is **complementary** to the gene.
- 4) Once made, the mRNA molecule moves **out** of the nucleus and joins with a **ribosome**.

**Translation**

- mRNA binds to a ribosome (site of protein synthesis)
- Protein is then assembled

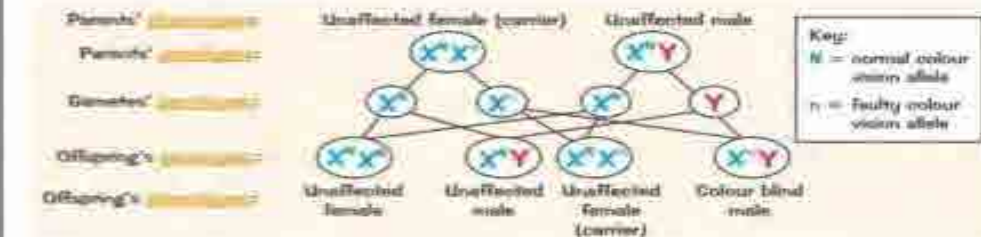
- 1) **Amino acids** are brought to the **ribosome** by another RNA molecule called **transfer RNA (tRNA)**.
- 2) The **codon** in which the amino acids are brought to the ribosome **matches** the order of the **base triplet** in mRNA. **Base triplets** in mRNA are also known as **codons**.
- 3) Part of the tRNA's structure is called an **anticodon** — it is **complementary** to the **codon** for the amino acid. The pairing of the codon and anticodon makes sure that the amino acids are brought to the ribosome in the **correct order**.
- 4) The amino acids are **joined together** by the ribosome. This makes a **polypeptide** (protein).

**Gregor Mendel (Pg 37)**

- Identified the presence of dominant and recessive genes through his work on peas

**Sex-linked disorders (Pg 40)**

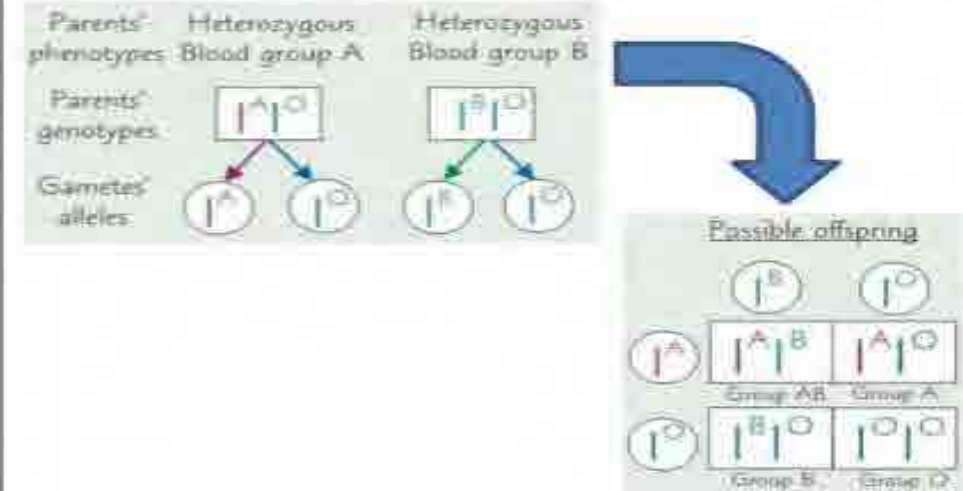
- X and Y chromosomes are a different length (Y is shorter)
- Genes present on the longer part of the X chromosome automatically expressed in the phenotype of a boy as there is no corresponding gene to compete with it.
- Sex-linked disorders more likely to be seen in boys because of this.
- For example: colour-blindness



- No possible colour blind female offspring, 50% chance of colour blind if having a boy.

**Blood groups (Pg 41)**

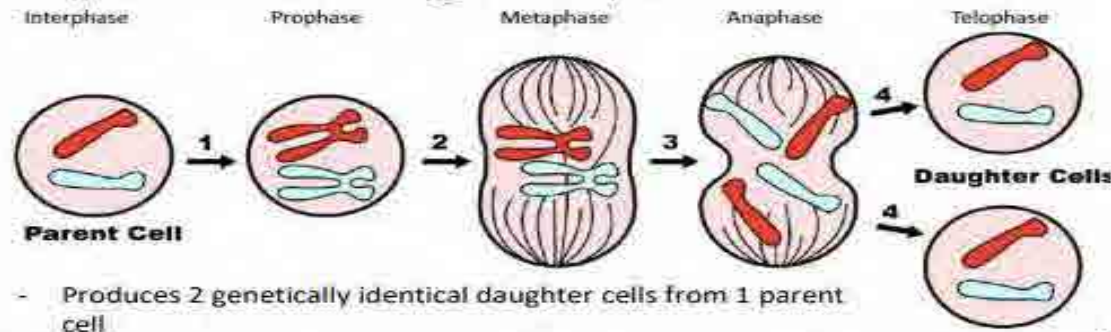
- Four blood groups (A, B, AB & O).
- Three possible alleles ( $I^A$ ,  $I^B$  &  $I^O$ ) — this is known as codominance
- $I^A$  &  $I^B$  are codominant with each other,  $I^O$  is recessive
- Blood group AB caused by having  $I^A I^B$  genotype





**Mitosis (p20)**

- Type of cell division used for growth and repair



- Produces 2 genetically identical daughter cells from 1 parent cell

**Interphase** – cell makes extra sub-cellular parts. DNA replication occurs, chromosome copies stay attached.

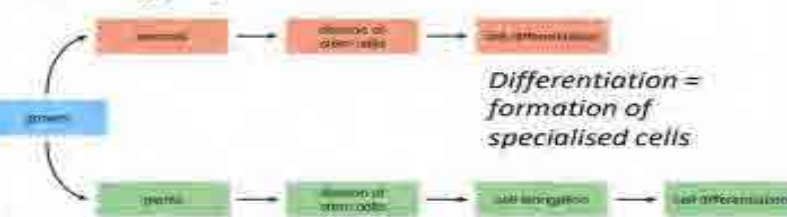
**Prophase** – nucleus breaks down and spindle fibres appear. Chromosomes become visible

**Metaphase** – chromosomes use spindle fibres to line up along the middle of the cell.

**Anaphase** – chromosome copies are separated and move apart to each end of the cell using spindle fibres.

**Telophase** – a new nuclear membrane forms around each set of chromosomes.

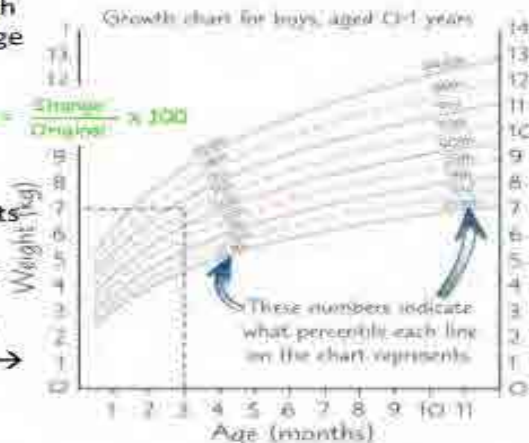
**Cytokinesis** – new cell membrane forms to separate the 2 daughter cells.

**IPMATC****Growth (p21)**

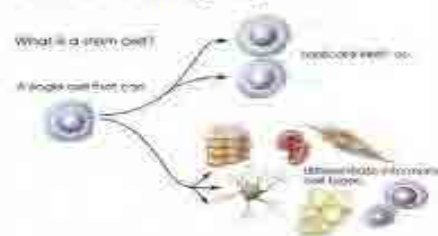
- Measure growth using percentage change

$$\text{Percentage change} = \frac{\text{Change}}{\text{Original}} \times 100$$

- Or using percentile charts which divide a measurements from a large group into 100 equal sections →



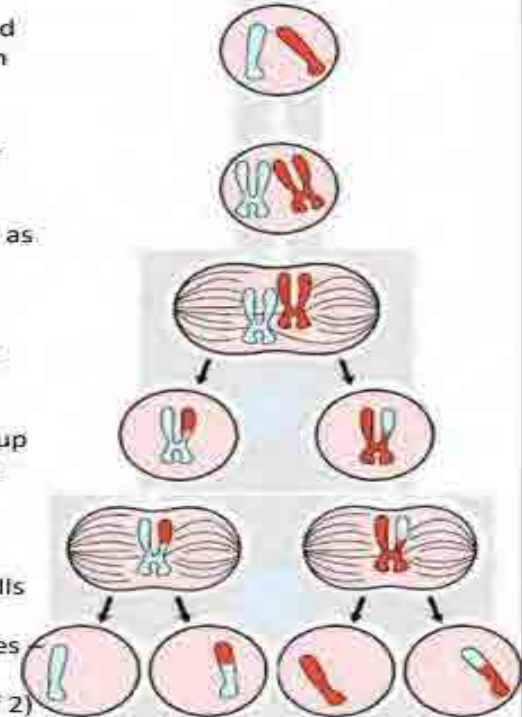
E.g. a three-month-old who weighs 7 kg is just above 75th percentile – roughly 75% of three-month-olds are lighter and 25% are heavier

**Stem Cells (p22)**

- Embryonic stem cells found in embryos can differentiate into any specialised cell
- Adult stem cells are limited in the type of cell they can differentiate into
- Lots of potential uses
- Ethical issues
- Plant stem cells called meristem cells are found in shoots and roots and can differentiate into any cell type

**Meiosis (p26)**

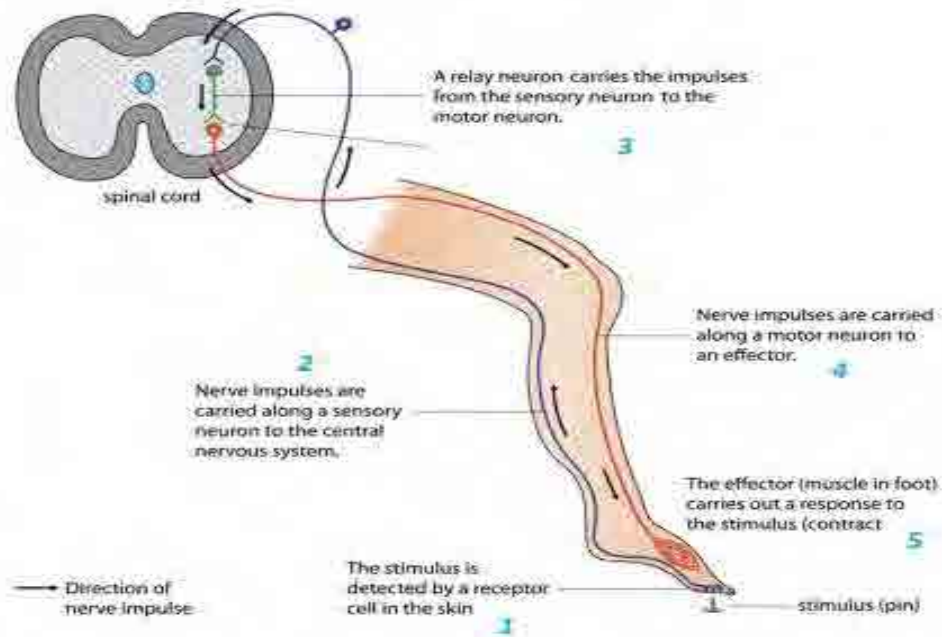
- Type of cell division used to form gametes (sperm and egg cells)
- Produces 4 genetically different daughter cells from 1 parent cell
- The chromosomes are copied in the same way as mitosis
- Pairs of copied chromosomes line up along the middle of the cell
- The pairs separate
- The chromosomes line up along the middle of the cell again
- The copies within each pair then separate
- This leaves 4 haploid cells (half of the original number of chromosomes in this diagram 1 chromosome instead of 2)



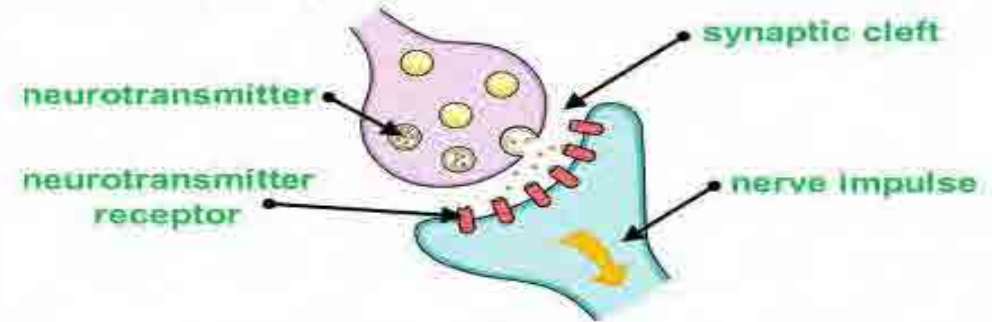


**Reflexes (p24)**

- An automatic response to a stimulus

**Synapses (p24)**

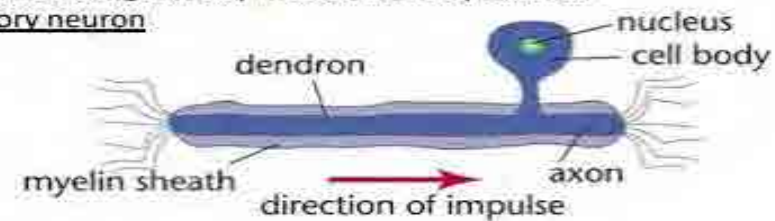
A **synapse** is a junction between two neurones across which electrical signals must pass.



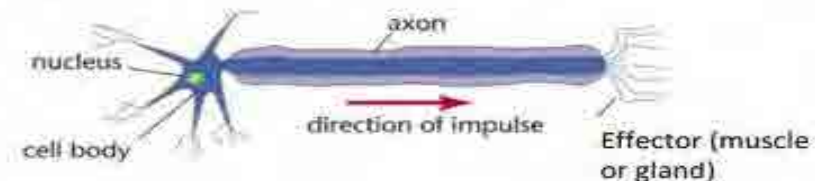
Neurotransmitter molecules diffuse from vesicles towards the neurotransmitter receptors, moving from an area of high concentration to low concentration.

**Nervous System (p23)**

- Central nervous system = brain and spinal cord
- Peripheral nervous system = all other neurones (nerve cells) around the body, including sensory motor and relay neurones
- Sensory neuron



- Motor neuron



Don't forget to try the revision questions for topics 1 & 2 on page 25!

¿Cuál es tu festival favorito?	What is your favourite festival
Mi festival favorito es...	My favourite festival is..
 La Navidad	Christmas
 La Nochebuena	Christmas Eve
 La Nochevieja	New Year's Eve
 El día de año nuevo	New Year's Day
 El día de los Reyes Magos	Three Wise Men Day
 La Semana Santa	Easter / Holy Week
 Las hogueras	The bonfires
 La feria de abril	The April fair
 Día de muertos	The day of deaths
 El cumpleaños	Birthday
 El carnaval	Carnival
 La feria	Fair
 El día de la madre	Mother's day
 El día del padre	Father's day
 El día festivo	Bank Holiday
 El encierro	The bull running
 Las fallas	Fallas
 Els castells	Human towers
 La Tomatina	Tomato festival

## 9.12 Festivals

### Spanish Vocab List



¿Qué hacemos para celebrar?	What do we do to celebrate?
Me levanto	I get up
Me ducho	I shower
Me visto	I get dressed
Recibo regalos	I receive presents
Soplo velas	I blow candles
Monto el árbol de Navidad	I put up the Christmas tree
Compro ropa nueva	I buy new clothes
Voy a la iglesia	I go to church
Voy a la mezquita	I go to the mosque
Voy a la plaza	I go to the square
Voy a casa de...	I go to ...'s house
... llega	... arrives
Comemos...	We eat...
Ayunamos	We fast
Jugamos a juegos de mesa	We play table games
Celebramos	We celebrate
Lo paso muy bien	I have a good time
Me acuesto	I go to bed
Voy a dormir	I go to sleep

¿Cómo es?	How is it like?
Emocionante	Exciting
Conmovedor	Moving
Divertido	Fun
Insoportable	Unbearable
Impactante	Striking

¿Qué pasa en los encierros / las corridas de toros?	What happens in the bull running / bull fighting?
San Fermin	A bull running festival held in Pamplona every July
Los toros	The bulls
Las calles	The streets
Correr	To run
Las corridas de toros	Bullfighting
Los encierros	Bull running
La plaza de toros	The bullring



¿Qué pasa en las Fallas?	What happens in Fallas?
Fallas	A festival held in Valencia every March
La hoguera	The bonfire
El cartón	Cardboard
Las fallas	Sculptures made of cardboard
Los fuegos artificiales	Fireworks
Los petardos	Firecrackers
Las bandas de música	Music bands



¿Qué pasa en la Tomatina?	What happens in the tomato festival?
La gente	People
Lanza tomates	Throw tomatoes
Aplasta tomates	Squish tomatoes
Se ensucia	Gets dirty
Tiene lugar en Buñol	Takes place in Buñol
La batalla	The battle
El caos	Chaos







## 9.12 Geography & History

### Spanish Vocab List



La geografía	Geography
El país	The country
La región / la comunidad	The region
La ciudad	The city
El pueblo	The town/ village
La costa	The coast
Las islas	The islands
El interior	The inland regions

La historia	History
Castellano / Español	Spanish language
La Reconquista	Period of time when the Christian kingdoms "reconquered" the peninsula from the Muslims (Moors).
Moros	Moors – Muslim inhabitants of modern-day Spain in
Conquistadores	Conquerors of American territories in the 16th century
La Colonización	Colonisation of the Americas
La Guerra Civil Española	The Spanish Civil war between 1936 and 1939
La Dictadura fascista	The fascist dictatorship in Spain between 1939 and 1975
La Transición	Transition into democracy after the dictatorship
La monarquía parlamentaria	The current political system in Spain: a parliamentary monarchy, like in the UK


El lenguaje de todos los días	Everyday language
¡Hola!	Hello
Buenos días	Good morning
Buenas tardes	Good afternoon
Buenas noches	Good night
¿Cómo te llamas?	What's your name?
Me llamo...	My name is...
¡Adiós!	Goodbye
Hasta luego / hasta la vista	See you later
Por favor	Please
Gracias	Thank you
Muchas gracias	Thanks a lot
De nada	You are welcome
Perdone / Perdón	Excuse me / Apologies
Lo siento	I'm sorry
¿Habla inglés?	Do you speak English?
Hablo un poco de español	I speak a bit of Spanish
No entiendo	I do not understand
¿Dónde hay un buen restaurante?	Where is a good restaurant?
¿Dónde está el centro / la playa?	Where is the centre / the beach?
Me he perdido	I am lost
Busco un hotel / un hospital / un banco	I am looking for a hotel / hospital / bank
Busco la estación / el aeropuerto / la parada de bus	I am looking for the station / airport/ bus stop
¿Me podría sacar una foto?	Could you take a picture?
¡Cuidado!	Be careful
¡Vamos!	Let's go!





Textiles Hierarchy of Key words		
Academic keywords, Tier 3	analyse	Plain seam
	embellishment	sustainable
	Woven/ bonded/ knitted	
Valuable keywords used in most lessons every lesson, Tier 2	Free machine embroidery	function develop
	Complementary colours	contrast environment
	fastening	
Basic keywords used in almost every lesson, Tier 1	compare	embroidery
	iron	equipment
	context	appliqué
	effect	improve
	colour	design shape
	machine	
	pattern	line Texture
	theme	tone
	thread	Fabric sew

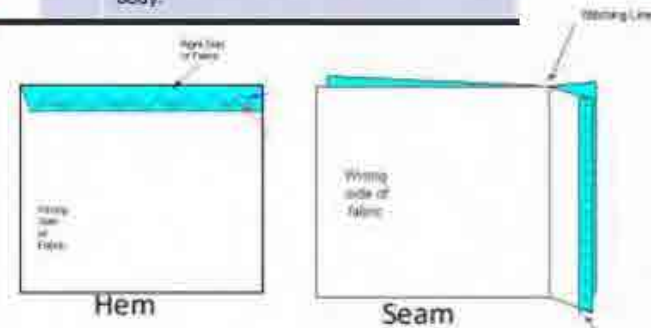
### Year 9 Textiles Knowledge Organiser

Equipment	Use
<b>Bobbin</b> 	A bobbin is a cylinder, to which cotton thread is wrapped around. It is found in the bottom part of a sewing machine.
<b>Overlocker machine</b> 	An overlocker does not replace a sewing machine. Its primary function is to clean finish a raw edge, giving the project a professional appearance.
<b>Quick unpick</b> 	It is used to quickly remove stitches and seams.
<b>Tailor's chalk</b> 	Used to mark on to fabric. It is easily washed off.
<b>Measuring Tape</b> 	It is a flexible ruler that can be used for body measurements, tailoring and dressmaking. It is flexible to measure fabric and curves of the body.

#### Batik



Batik is a type of resist printing process in which wax is applied to the fabric in specific areas. When the wax hardens, the fabric is submerged in dye. The wax prevents the dye from reaching the fibers. The fabric is then boiled to remove the wax. This fabric-dyeing method makes cotton look cracked. Batik is characterised by a unique, nearly pattern-less appearance.



#### What is the difference between a hem and a seam?

A hem is a neat non fraying edge made by folding fabric over and stitching it down. A seam is a line along which pieces of cloth are joined by sewing.

#### The 6 R's when it comes to sustainability



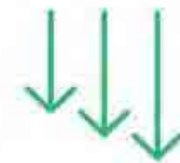
RETHINK



REFUSE



REPAIR



REDUCE



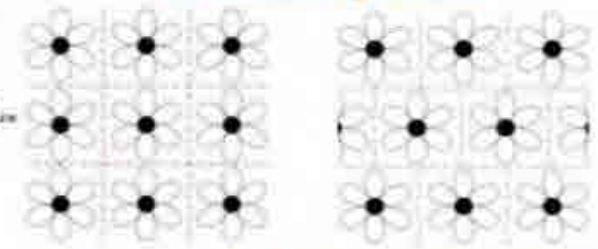
REUSE



RECYCLE



The motif has been repeated to make two different patterns.



plain repeat pattern

brick repeat pattern/offset repeat pattern


Use these in your writing and speaking

<b>Use connectives to link each paragraph!</b>	<b>Explain an idea:</b> <ul style="list-style-type: none"><li>Although</li><li>Except</li><li>Unless</li><li>However</li><li>Therefore</li></ul>	<b>Sequencing:</b> <ul style="list-style-type: none"><li>Firstly</li><li>Secondly</li><li>Next</li><li>Finally</li><li>Since</li></ul>
<b>Adding to:</b> <ul style="list-style-type: none"><li>Furthermore</li><li>Also</li><li>As well as</li><li>Moreover</li></ul>	<b>Cause and effect:</b> <ul style="list-style-type: none"><li>Thus</li><li>So</li><li>Therefore</li><li>Consequently</li></ul>	<b>Contrasting:</b> <ul style="list-style-type: none"><li>Whereas</li><li>Instead of</li><li>Alternatively</li><li>Otherwise</li><li>Then again</li></ul>
<b>To empathise:</b> <ul style="list-style-type: none"><li>Above all</li><li>Ultimately</li><li>Especially</li><li>Significantly</li></ul>	<b>To compare:</b> <ul style="list-style-type: none"><li>Likewise</li><li>Equally</li><li>In the same way</li><li>Similarly</li></ul>	<b>Give examples:</b> <ul style="list-style-type: none"><li>Such as</li><li>For example</li><li>In the case of</li><li>As revealed by</li><li>For instance</li></ul>

Sentence starter phrases


Most people would agree...  
Only a fool would think...  
We all know...  
A sensible idea would be...  
The fact is that...  
Surely you would agree that...  
Without a doubt...  
I am certain that...  
Some people might argue...  
However...  
Also...

**DESCRIBE**




I believe that...  
I think that...  
The main idea is...

**EXPLAIN**




This means that...  
Therefore...  
This maybe because...

**JUSTIFY**




This is positive because...  
This is negative because...  
It is useful/not useful because...

**ANALYSE**




One strength is...  
One weakness is...  
One argument is...

**EVALUATE**

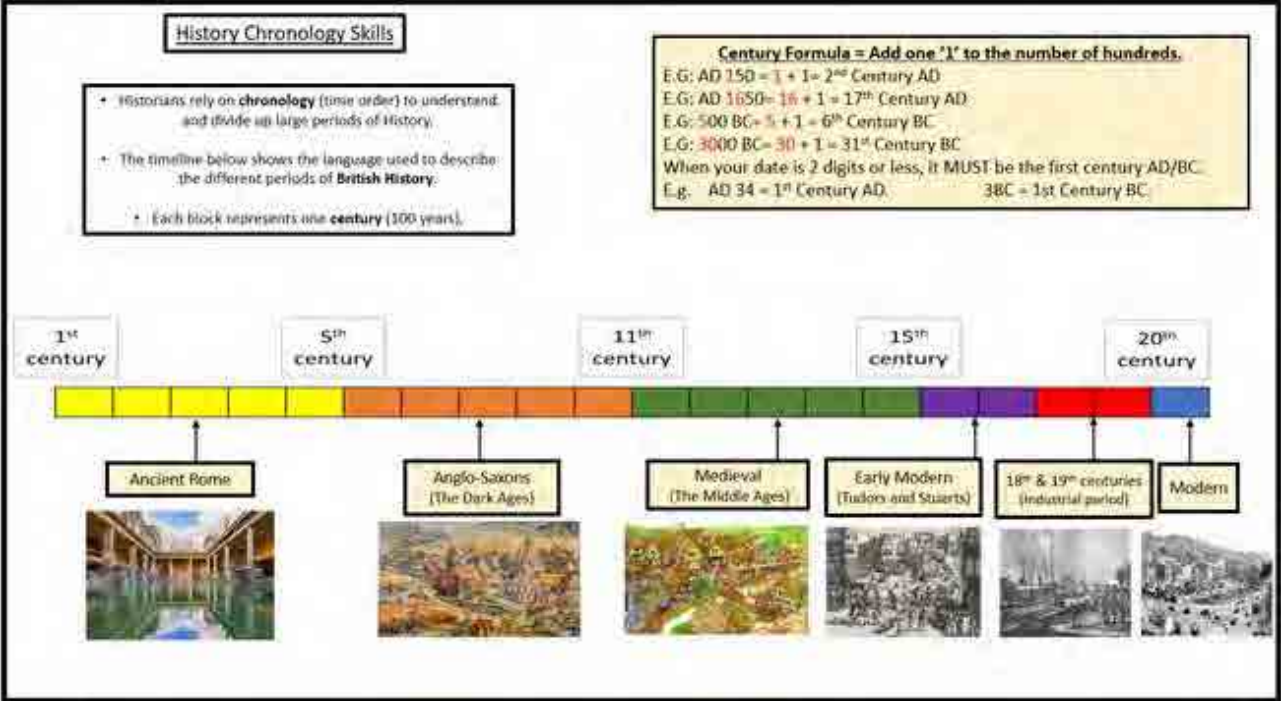


One advantage is...  
One disadvantage is...  
The best option is...

**COMPARE AND CONTRAST**



One similarity is...  
One difference is...  
On the other hand...



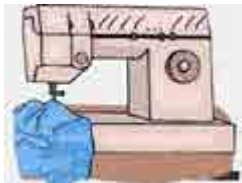


Use these in your writing and speaking in DT



# Design and Technology Keywords

Food and Nutrition	Design and Technology	Textiles
Caramelisation	Carbon footprint	Plain seam
Aeration    Amino acids	Planned Obsolescence	analyse    sustainable
Plasticity    Shortening	Iterative Design    Tolerance	embellishment
Denaturation	Technology Push	Woven/ bonded/ knitted
Coagulation	Anthropometrics	Free machine    function
Gelatinisation	Consumer    Social Footprint	embroidery    develop
Emulsification	Ergonomics    Forming Processes	
Pasteurisation		
Unsaturated    Protein	Aesthetics    Target Market	Complementary colours
Radiation    Saturated	Properties    Deciduous	contrast    environment
Carbohydrates	Automation    Coniferous	fastening
Conduction	Functionality	compare    embroidery
Deficiency	Primary Source    Sustainability	iron    equipment
Digest    Convection	Continuous Improvement	context    appliqué
Cross-contamination		effect    improve
Micro-organisms		
Flavour    Claw grip	Cost    Customer	colour    design    shape
Texture    Aroma	Materials    Annotation	machine
Nutrients	Product	pattern    line    Texture
Energy	Safety    Environment	theme    tone
Appearance    Bridge hold	Design    Prototype	thread    Fabric    sew
Mix    Smell	User	



## Sentence Starters - DT

*I have designed...because*  
*My project was about...*  
*I found... during my research*  
*My design is suitable for...*  
*I have learnt how to...*  
*The most enjoyable part of my project was....*  
*The area I found the most challenging was...*  
*Equipment I have used include...*  
*I would improve my work by...*  
*I am pleased with my finished product because...*

## Sentence Starters- Food and Nutrition

*In order to work hygienically/safely I made sure I ....*  
*I worked safely when in the kitchen by...*  
*If I could improve any skill, I would improve...because...*  
*Overall, I am happy/unhappy with my progress/dish because....*  
*The texture of my dish is... this is because...*

## Sentence starters- Textiles

*I have designed....*  
*The context of my design is...*  
*My research is useful because...*  
*By researching, I am able to.....*  
*By researching I have found out....*  
*I researched into....*  
*My design is suitable for.....*  
*My design is based upon...*  
*I have planned to..*  
*The order I will work in is...*  
*The most enjoyable part of m project was...*  
*The area I found most challenging was...*  
*I am most pleased with...*  
*I am pleased with my finished project because...*  
*Equipment I used was...*



# The periodic table of the elements

1	2											3	4	5	6	7	0	
<div>Key</div> <div>relative atomic mass atomic symbol name atomic (proton) number</div>																	<div>1 H hydrogen 1</div>	<div>4 He helium 2</div>
<div>7 Li lithium 3</div>	<div>9 Be beryllium 4</div>											<div>11 B boron 5</div>	<div>12 C carbon 6</div>	<div>14 N nitrogen 7</div>	<div>16 O oxygen 8</div>	<div>19 F fluorine 9</div>	<div>20 Ne neon 10</div>	
<div>23 Na sodium 11</div>	<div>24 Mg magnesium 12</div>											<div>27 Al aluminium 13</div>	<div>28 Si silicon 14</div>	<div>31 P phosphorus 15</div>	<div>32 S sulfur 16</div>	<div>35.5 Cl chlorine 17</div>	<div>40 Ar argon 18</div>	
<div>39 K potassium 19</div>	<div>40 Ca calcium 20</div>	<div>45 Sc scandium 21</div>	<div>48 Ti titanium 22</div>	<div>51 V vanadium 23</div>	<div>52 Cr chromium 24</div>	<div>55 Mn manganese 25</div>	<div>56 Fe iron 26</div>	<div>59 Co cobalt 27</div>	<div>59 Ni nickel 28</div>	<div>63.5 Cu copper 29</div>	<div>65 Zn zinc 30</div>	<div>70 Ga gallium 31</div>	<div>73 Ge germanium 32</div>	<div>75 As arsenic 33</div>	<div>79 Se selenium 34</div>	<div>80 Br bromine 35</div>	<div>84 Kr krypton 36</div>	
<div>85 Rb rubidium 37</div>	<div>88 Sr strontium 38</div>	<div>89 Y yttrium 39</div>	<div>91 Zr zirconium 40</div>	<div>93 Nb niobium 41</div>	<div>96 Mo molybdenum 42</div>	<div>[98] Tc technetium 43</div>	<div>101 Ru ruthenium 44</div>	<div>103 Rh rhodium 45</div>	<div>106 Pd palladium 46</div>	<div>108 Ag silver 47</div>	<div>112 Cd cadmium 48</div>	<div>115 In indium 49</div>	<div>119 Sn tin 50</div>	<div>122 Sb antimony 51</div>	<div>128 Te tellurium 52</div>	<div>127 I iodine 53</div>	<div>131 Xe xenon 54</div>	
<div>133 Cs cesium 55</div>	<div>137 Ba barium 56</div>	<div>139 La* lanthanum 57</div>	<div>178 Hf hafnium 72</div>	<div>181 Ta tantalum 73</div>	<div>184 W tungsten 74</div>	<div>186 Re rhenium 75</div>	<div>190 Os osmium 76</div>	<div>192 Ir iridium 77</div>	<div>195 Pt platinum 78</div>	<div>197 Au gold 79</div>	<div>201 Hg mercury 80</div>	<div>204 Tl thallium 81</div>	<div>207 Pb lead 82</div>	<div>209 Bi bismuth 83</div>	<div>[209] Po polonium 84</div>	<div>[210] At astatine 85</div>	<div>[222] Rn radon 86</div>	

\* The elements with atomic numbers from 58 to 71 are omitted from this part of the periodic table.

*The relative atomic masses of copper and chlorine have not been rounded to the nearest whole number.*





## Subject websites

These websites will help you with homework, reading around the subject and revision

### English

<https://www.sparknotes.com/> - *Macbeth, A Christmas Carol, An Inspector Calls*

<https://app.senecalearning.com/> - *Macbeth, A Christmas Carol, An Inspector Calls, Power and Conflict Poetry*

<https://www.bbc.com/bitesize> - *Macbeth, A Christmas Carol, An Inspector Calls*

### Maths

<https://corbettmaths.com/>

<https://vle.mathswatch.co.uk/vle/>

<https://www.mathspad.co.uk/>

### Science:

<https://www.bbc.com/bitesize>

<https://www.senecalearning.com/>

<https://www.memrise.com/>

### Geography

Time for Geography - videos (mainly focused on physical processes)

Bitesize

Cool Geography

### History

Seneca Learning

BBC bitesize - use Edexcel resources for GCSE.

### Art Websites

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

<https://www.bbc.co.uk/bitesize/subjects/z6f3cdm>

<https://www.incredibleart.org/>

### Computer Science and IT.

[www.mrahmedcomputing.co.uk](http://www.mrahmedcomputing.co.uk)

### Drama

<https://youtu.be/VeTpob9LBM8>

<https://youtu.be/wISEU13mRBE>

<https://www.bbc.co.uk/bitesize/guides/zsf8wmn/revision/1>

### DT:

<http://www.mr-dt.com/>

<http://technologystudent.com/>

<https://www.senecalearning.com/>

### PE

<https://www.bbc.com/bitesize/examspecs/ztrcg82>

<https://sites.google.com/view/ocrgcseperevision/home>

### RS

KS3 <https://www.bbc.co.uk/bitesize/subjects/zh3rkqt>



Timetable

	Monday	Tuesday	Wednesday	Thursday	Friday
Tutor time					
Lesson 1					
Lesson 2					
Break					
Lesson 3					
Lesson 4					
Lunch					
Lesson 5					
Lesson 6					