

# CHRIST THE KING KNOWLEDGE ORGANISERS

#CTKCARES



Year 8  
Term 3



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## SELF-QUIZZING

### Why should I self-quiz?

Your mind is split into two parts: the working-memory and the long-term memory. Everybody's working-memory is limited, and therefore it can very easily become overwhelmed. Your long-term memory, on the other hand, is effectively limitless.

You can support your working memory by storing key facts and processes in long term memory. These facts and processes can then be retrieved to stop your working memory becoming overloaded.

This booklet contains knowledge organisers for all of your subjects. Each knowledge organiser has the key information that needs to be memorised to help you master your subject and be successful in lessons.

### How often should I self-quiz?

Research shows that regular testing improves knowledge retention; in order to learn the information in your knowledge organiser, you will need to work with it more than once! There are many different ways to learn the material in your knowledge organiser.

### How to use my Knowledge Organiser

**1. Cover – Write – Check:** Cover up one section of the knowledge organiser, and try to write out as much as you can from memory. Check the knowledge organiser to see if you are right; correct any mistakes and fill in any missing information in your green pen.

**Repeat this process at least twice to fill your page.** You could also include content from the previous week's homework – especially if there were some parts you struggled with.

**2. Draw a mind map,** jotting down everything that you can remember from the knowledge organiser. Check accuracy, correct in green pen and then repeat.

**3. Revision clock –** draw a clock and add the topic in the middle. Break the clock face into 10 minute sections. Add notes from the knowledge organiser in each section. Cover the clock and recite the information aloud.

**4. Use your knowledge organisers to create flashcards.** These could be double sided with a question on one side and the answer on the other.

Alternatively, a keyword on one side and a definition o

### QUICK FACT

#### Did you know

Research shows students remember 50% more when they test themselves after learning something

50%







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## HOMework SCHEDULE

**You should complete at least one hour of Home Learning per school day.**

**This will consist of:**

- Knowledge Organiser and Online Learning as directed by your teachers.
- If you have no tasks set, carry out Knowledge Organiser activities as per the Knowledge Organiser timetable below.
- Two periods of 20 minutes reading each week

Week 1					
20 Minutes Per Subject	Monday	Tuesday	Wednesday	Thursday	Friday
<b>Subject 1</b>	English	Science	Maths (MyMaths)	Maths	English
<b>Subject 2</b>	RE	PE	RE	Science	Geography
<b>Subject 3</b>	Music	History	Technology/IT	MFL	Art
Week 2					
20 Minutes Per Subject	Monday	Tuesday	Wednesday	Thursday	Friday
<b>Subject 1</b>	Science	English	English	Maths (MyMaths)	Science
<b>Subject 2</b>	RE	Maths	RE	Drama	Geography
<b>Subject 3</b>	Music (Practical)	History	Technology/IT	MFL	Art (Practical)

Read **20 minutes** a day and you'll read 1,800,000 words per year.

READING FOR **6 MINUTES A DAY** REDUCES STRESS BY 68%.

Children learn **4,000 to 12,000 words** per year through reading.



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## WHAT ARE THE HOMEWORK EXPECTATIONS?

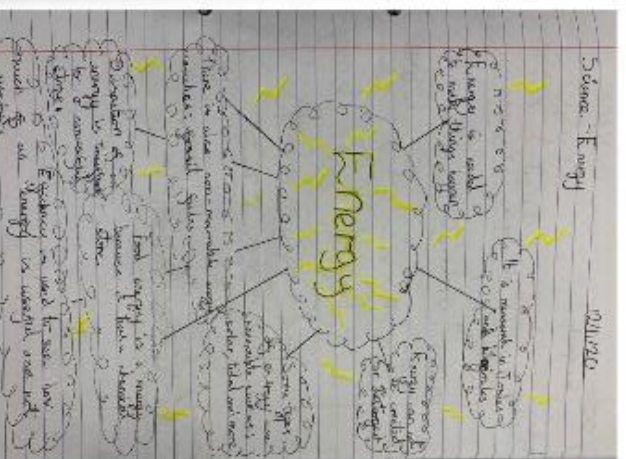
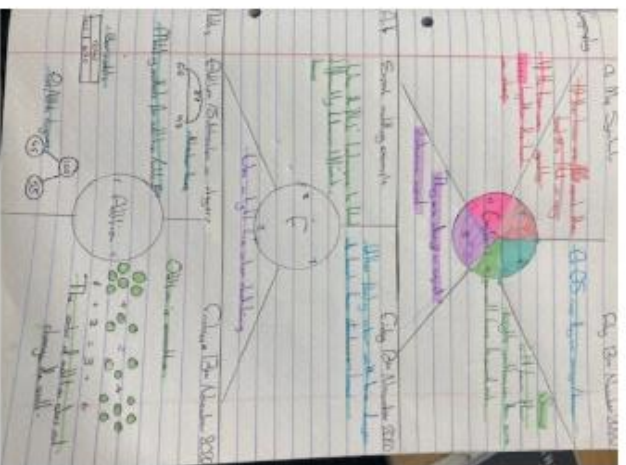
Each homework must meet the following 5 requirements:

1. Write the complete **title and date in full** eg. *Tuesday 9<sup>th</sup> September 2017* on each page, **underlined**
2. You should include a **minimum of words** to summarise the topic. Do not copy the words from the text.
3. Make **full use of the page** for each topic by scaling your notes & images appropriately to use of all the space.
4. You must include **diagrams, sketches or cartoon doodles** to visually represent the topic, try to use humour.
5. **Highlight key words** and phrases, using underline, highlighter pens. Explain technical terms

## HOW SHOULD I PRESENT MY WORK?

Please remember that the same rules apply to the presentation of your homework as apply for your class work: **dates and titles (which should be the name of the subject) need to be underlined with a ruler** and you should **present your work as neatly as you are able to**.

If you are self-quizzing correctly, there should be **evidence of green pen on your page**. Here are some examples of how to set out your work:



### QUICK TIP

*Don't forget*

Always record the date, topic and page number in your Home Learning Book!



## Landscape Project

**Landscape Art** can come in many different forms such as paintings, drawings, photographs, prints and even sculptures. They often show images of nature such as the countryside but also can depict cities and urban areas. Landscape Art can be **abstract** and **realistic** and can document factual events or can be used to express the feelings and emotions of the artist. created

1. Perspective	a techniques which attempts to create the illusion of depth and 3 dimensions in a drawing or painting.
2. Background	usually at the top and back of the painting or drawing and appears to be further away.
3. Foreground	can be seen at the front or bottom of a landscape which appears to be closer.
4. Post Impressionism	started in Europe in the late 19 <sup>th</sup> century, characteristics include bright colours and thick brush strokes.
5. Brush strokes	can shape and form and direction in a painting.
6. Composition	how you arrange and place the different parts of a piece of art work
7. Horizon line	used to show where the land disappears in the distance
8. Vanishing point	used when drawing in perspective to create a 3D effect
9. Cityscape	A landscape which shows 'urban' areas including buildings and streets.

**Brush strokes and use of line** are a key characteristic of **'Post Impressionism'**



Famous Van Gogh painting 'Starry Night'



**'Post Impressionism'**

- Began in Europe in the late 19<sup>th</sup> century.
- Paintings would show scenes of 'everyday life' such as people at work, the countryside and nature.
- Paintings would use brighter vivid colours and thick brush strokes.
- Post Impressionist painters tried to capture 'natural light and emotion' in their work.
- Vincent van Gogh, Paul Gauguin, Paul Cezanne and George Seurat are considered original Post Impressionist artists



**Vincent van Gogh** (born 30 March 1853 – 29 July 1890) was a Dutch post-impressionist painter. His work had a great influence on modern art because of its striking colours and emotional power. He suffered from anxiety and fits of mental illness and famously cut off his ear lobe. During a 10 year painting career, he produced over 1000 pieces of work. Although he only sold one painting in his life time, his work is now extremely valuable and popular sells for millions.



**KudaMushangibi** (born 1995 Nottingham) now based in London, Kuda is a painter and architectural assistant. He is a previous CTK student who completed his GCSEs and A Levels before studying Architecture at John Moore's University in Liverpool. Kuda's art is influenced by many traditional and contemporary artists from all over the world. He paints portraits, interiors and landscape. Kuda's work often reflects his feelings and thoughts about society and his heritage. His landscape paintings have a strong connection to Post Impressionistic painting.

WHAT AM I  
DOING  
WELLWHAT DO I  
NEED TO DO  
TO IMPROVEHOW ARE THE AUDIENCE  
IMPACTED BY THE ACTING  
AND DESIGN CHOICESYEAR 8  
wonder.land

## CHARACTERISATION

Using a range of physical and vocal skills to show a character who is different to you.

## TONE OF VOICE

The emotion behind what your character says e.g. an angry tone, a surprised tone.

## PITCH

How high or low your character's voice is.

## PACE

The speed at which your character speaks or moves.

## GESTURES

Using your hands (or sometimes eyes and head) to communicate meaning with other characters and the audience e.g. pointing/winking.

## BODY LANGUAGE

Showing emotion through the way you sit, stand or position yourself.

## FACIAL EXPRESSION

Showing emotion through your face- eyes, mouth, eyebrows...

moment effect scene  
script stage skills physical  
suggests words we use to talk about theatre  
choices actor element  
successful story dialogue  
design character movement  
engaging audience line  
director performance vocal



## Writing structure

**WHAT?** Explain which element was successful.

**HOW?** Explain exactly how this moment was created.

**WHY?** Why was it successful? What impact did it have on the audience?

**JUSTIFY** How did you feel about this particular moment?



**DESIGNER**  
The person in charge of making decisions about a particular element of the production.

## SET

The scenery and furniture on the stage throughout the production.

## PROPS

The items held or used by actors on stage to make the action more realistic.

## COSTUME

What the actors wear when performing. Costume can denote character, historical era and the style of the production.

## MUSIC AND SOUND

Live or recorded sound used to enhance a production and create a certain atmosphere.

## LIGHTING

Lighting is used to make sure the audience can see the actors and set, focus their attention on what is important and to create a mood.

## LEVELS

Used to create different locations or to show status on stage.

## COLOUR/FIT/STYLE

Can suggest a character's personality, occupation or status.



- One moment that stood out for me was...
- This helped to communicate to the audience that...
- This effect was created by...
- This could have been communicated more effectively by...
- The actor/designer used... effectively to create...
- The impact of this on the audience was...
- This created an atmosphere/ feeling of...
- Overall the cast & crew successfully communicated...



**ACT 1**

Extreme hatred exists between the Montague and Capulet families. A brawl breaks out in streets in the opening scene between the two families. Romeo meanwhile is missing (busy being lovesick for Rosalind) who does not return his love. Paris visits the Capulet household and asks to marry Juliet. Paris is invited to the Capulet ball. Benvolio persuades the lovesick Romeo to 'gatecrash' the Capulet ball. Lady Capulet and the nurse try to convince Juliet that Paris would make a good husband. At the ball, Tybalt spots Romeo and wants to confront him. Lord Capulet prevents the fight. Romeo and Juliet meet and it's love at first sight.

**ACT 2**

Romeo scales the garden wall – desperate to see Juliet. They exchange love vows on the balcony and plan to marry. Romeo asks Friar Lawrence to arrange the marriage. The Friar only agrees as he hopes it will unite the families and end the feud. The Nurse acts as a go between helping the young lovers. Romeo and Juliet are married in secret.

**ACT 3**











Benvolio is with Mercutio. Tybalt is looking for a fight with Romeo. However, Romeo refuses to fight back. Mercutio thinks Romeo is behaving in a cowardly way and he fights Tybalt instead. Mercutio is stabbed after Romeo tries to intervene and prevent the fight. Mercutio curses the two families: "a plague on both your houses." The Prince arrives and condemns Romeo to exile as he killed Tybalt in revenge for his friend's death. Romeo is banished. Paris arrives to marry Juliet. Lord Capulet wants the marriage to go ahead.

**ACT 4**

Juliet is given a potion by Friar Lawrence to make her appear dead. He then sends a message to Romeo to hurry back to Verona. Juliet's family are devastated when they learn of her death and they take her body to the family tomb.

**ACT 5**

Romeo learns that Juliet has died. He returns to Verona to visit the tomb. The messenger who was sent to tell Romeo that Juliet was not really dead admits to Friar Lawrence that he was prevented from leaving the city and delivering his message by an outbreak of disease. Paris visits Juliet's tomb. Romeo meets him there but does not know who he is. Seeing each other they fight. Romeo kills Paris. Romeo takes the poison. Juliet wakes and sees Romeo dead she takes Romeo's dagger and kills herself.

	LITERARY TERMS		KEY CONCEPTS
	<b>Soliloquy:</b> a long speech expressing the thoughts of a character alone on stage.		Courtly love: courtly love' sees love as ideal, not real. Rather than meeting the loved one, lovers exchanged letters and poems comparing their lover to beautiful, exaggerated ideas like angels or goddesses.
	Sonnet: a 14 line poem in rhyming couplets. It traditionally is about the topic of love. There is a change in meaning or twist in the final lines.		Fate: the idea that higher powers such as God or fate controlled the events in a person's life. The prologue about 'star-crossed lovers' introduces the role of fate from the start.
	Dramatic irony: when the audience knows something that the characters don't.		Honour code: a sense of family honour at the time meant that any small insult had to be repaid with revenge. This could lead to violence, death and civil unrest (large brawls across a city.)
	Hyperbole: an over exaggeration - not meant to be taken literally		Patriarchy: whereby men hold the power and women are excluded from it. For example, the father was the ruler of the household, and women had no rights in law. Daughters were regarded as 'property' and often married off very young as a way to join wealthy and powerful families.
	Foreshadowing: the playwright gives us hints or clues to suggest what will happen later in the plot.		Catholicism: the Italy in which the play is set was a catholic society, which believed that suicide was a mortal sin, punished by an eternity in hell.

## CHRIST THE KING - KNOWLEDGE ORGANISERS

## CHARACTERS

ROMEO	The only son of Lord and Lady Montague. More interested in love than violence.
JULIET	The only daughter of Lord and Lady Capulet. Young and extremely protected by her family.
FRIAR LAWRENCE	A priest who Romeo and Juliet go to for advice when they want to marry.
MERCUTIO	Part of the Montague family. He is a friend of Romeo who likes to laugh and have fun. He can also be hot headed.
TYBALT	Juliet's cousin. He is a very proud man and loyal towards his family. He is a great sword fighter.
BENVOLIO	Romeo's friend and cousin. He likes to try to keep the peace and to resolve conflicts.
PARIS	A wealthy and well respected man who has come to offer to marry Juliet.
LORD CAPULET	Juliet's father who controls and rules his family.
LADY CAPULET	Juliet's mother. She has not brought up her daughter she has relied on the nurse.
NURSE	The main person who has cared for Juliet all her life. She is a trusted servant of the family.
LORD MONTAGUE	Romeo's father. He is a bitter enemy of the Capulet's.
LADY MONTAGUE	Romeo's mother who loves her son and is heartbroken when he is banished from Verona.
PRICE ESCALUS	The Prince of Verona whose responsibility it is to maintain peace in the city.

## VOCABULARY

## WEEK 1

Feud- *long standing argument*  
 Transgress - *disobey*  
 Honour - *respect*  
 Equality - *fairness*  
 Destiny - *fate*

## WEEK 4

Revise vocabulary from previous weeks

## WEEK 2

Archetype – *typical example*  
 Naïve- *innocent, trusting*  
 Idolise – *love greatly*  
 Hence - *away from here*  
 Reckless- *careless*

## WEEK 5

Submissive – *obeys easily*  
 Rebellious- *disobedient*  
 Tragedy – *downfall of main character*  
 Vindictive- *seeking revenge*  
 Portray – *to show/to represent*

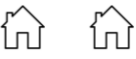









## WEEK 3

Obedience – *obeying powerful people*  
 Demure- *modest, quiet, reserved*  
 Passion- *strong feelings*  
 Futile- *pointless*  
 Subsequent- *following*

## WEEK 6

Oppression- *cruel/unjust treatment*  
 Patriarchy- *system of male power*  
 Nemesis – *hated enemy*  
 Passive - *accepting*  
 Betrayal - *disloyal*

## QUOTATIONS

				
<b>"Two households both alike in dignity"</b> When - Prologue	<b>"A pair of star crossed lovers take their lives"</b> When - Prologue	<b>"Younger than she are happy mothers made."</b> Who - Paris When - Act 1	<b>"if looking liking move: But no more deep will I endart mine eye Than your consent gives strength to make it fly."</b> Who - Juliet When - Act 1	<b>My lips two blushing pilgrims"</b> Who – Romeo When – At the Capulet ball
				
<b>"My only love sprung from my only hate"</b> Who – Juliet When – After the ball	<b>"What's in a name? That which we call any rose by any other name would smell as sweet."</b> When - Act 2 Who - Juliet	<b>"Arise, fair sun, and kill the envious moon"</b>  Who - Romeo When - Balcony scene	<b>"A plague on both your houses"</b> When - Act 3 Who - Mercutio after the fight where he is accidentally stabbed and lies dying	<b>"For I will raise her statue in pure gold,"</b> When - Act 5: Who – Montague assures Capulet that he will erect a gold statue in her memory



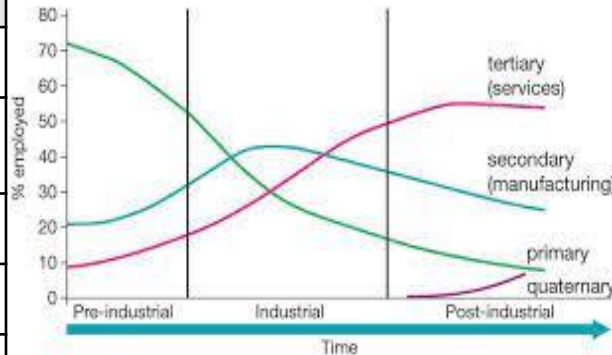
Economy	The wealth and resources of a country in terms of the goods that are produced and consumed there
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1. Sectors of Industry	
Primary sector	Includes jobs in which people extract natural materials
Secondary sector	Includes jobs in which people make products out of raw materials often in factories
Tertiary sector	Includes jobs in which people provide a service for others
Quaternary sector	Includes jobs in which people research and invent things using advanced technology
Raw materials	Basic materials, e.g. wood or metal which can be used to make something

3. Agriculture	
Arable farming	Where crops are grown e.g. wheat and barley
Pastoral farming	Where animals are raised e.g. cattle and sheep
Mixed farms	Where crops are grown and animals kept
Mixed gardens	Where fruits, vegetables and flowers are grown
Subsistence farming	Farmers growing only enough to feed themselves and their families – anything leftover can be sold

5. Retail change in the UK	
Retail	The selling of goods in relatively small quantities
Convenience goods	Goods bought nearly everyday such as bread, milk. Readily available from the majority of shops
Comparison goods	Higher value goods purchased less often such as electrical goods, clothes. People go to several shops to compare before buying .
Clone town	A town where the high street is dominated by chain stores
Out of town retail parks	Areas of shops located away from the traditional CBD

## 2. Clark Fisher Model – showing sectors of industry over time



4. Factors in determining factory locations	
Costs	Buying/leasing land, equipment, wages, training, taxes
Capacity of the workforce	Availability of local labour with the right skills
Capability of the region	Raw materials available, availability of road/rail connections
Culture of the region	Ability to attract talented workforce, government policies supporting industry
Customers	Close by to the markets
Physical Landscape	Flat land/space for expansion

8. Economic advantages of tourism	
Supports employment, for example in hotels, restaurants and shops	
Boosts local farming to supply hotels and restaurants	
Encourages improvements in road networks and the environment	
Brings income for the local economy, which can be spent on improving public services	

6. Globalisation & trade	
Globalisation	The increasing links between countries around the world as a result of the movement of goods, services, and money.
Transnational Corporation (TNC)	A company that has its headquarters in one country, but operates around the world
Containerisation	A system of transporting products by using freight containers (usually on ships)
Trade	Buying and selling raw materials, goods and services
Imports	Goods and services taken in by a country
Exports	Goods and services sold to another country
Balance of trade	The difference in value between a country's imports and exports
Trade link	A connection between two countries to allow the movement of goods and services

7a. Benefits of TNCs	7b. Costs of TNCs
Creation of jobs	Poorer working conditions
Improved education and skills	Damage to the environment
Investments in infrastructure e.g. roads	Profits go to companies overseas, not locals
Help exploit natural resources	Natural resources may be over-exploited

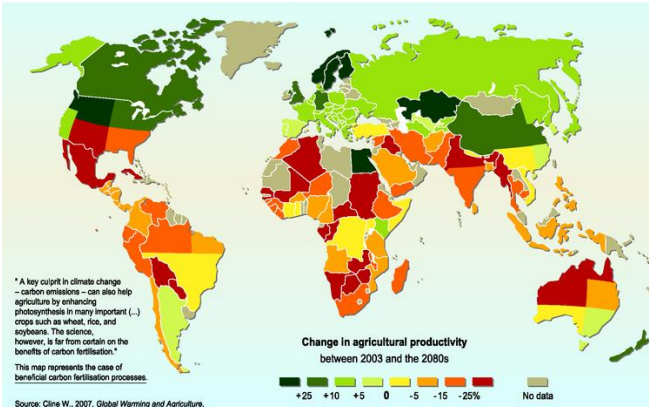
9. Migration	
Migrant	A person who moves from one place to another
Emigrant	A person who leaves a country to move to another one
Immigrant	A person who moves to a country from another country
Illegal Immigrant	A person who moves to another country without proper clearance
Economic Migrant	Someone who moves for money
Origin country	Where a migrant is from
Host country	Where a migrant moves to

**1. Climate Change key words**

Climate Change	Changes in climate as a result of natural causes or human activity
Global warming	The recent increase in global temperatures
Greenhouse effect	Trapping of the sun's warmth in our lower atmosphere which warms the earth
Greenhouse gases	Gases such as carbon dioxide and methane, which absorb heat from Earth
Anthropogenic	Environmental change caused by humans
Mitigation	To reduce or eliminate the effects of something from happening
Adaptation	Do not aim to reduce or stop global warming – actions taken to adjust to natural events

**2. Evidence of Climate Change**

Short-term	Long-term
Glacier retreat	Ice cores
Rising sea levels	Pollen analysis

**Projected impact of climate change on agricultural yields**

Pattern of global temperature changes over the past 2000 years which shows fluctuations of these temperatures with a rapid increase in the past century

**3. Causes of Climate Change**

Natural	Anthropogenic
Changes in the orbit and tilt of the Earth to the sun	Burning of fossil fuels
Volcanic activity	Deforestation
Solar output	Dumping waste into landfill
	Agriculture

**4. Natural Resources**

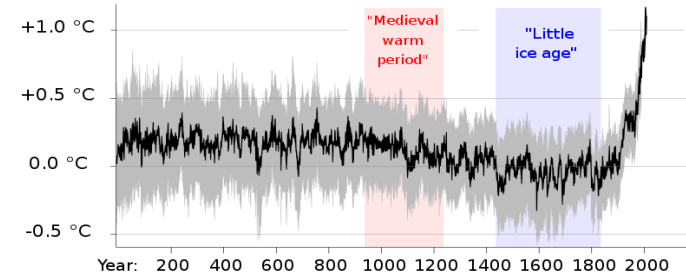
Natural Resource	Substances that are found in nature which can be used by humans for our benefit e.g. water, soil, coal, minerals, wood, animals
Energy Mix	The proportion of energy that comes from different sources e.g. coal, wind, solar
Fossil Fuels	Non-renewable energy sources e.g. coal, oil and natural gas
Renewable	Sources of energy that can be replaced when they are used
Non-renewable	Sources of energy that cannot be replaced once they are used

**5. Global Consequences of Climate Change**

Droughts
Storms
Heat waves
Rising sea levels
Melting glaciers
Warming oceans

**6. Effects on small island developing states (SIDS)**

Increase in storms
Relocation of populations
Loss of biodiversity
Coastal erosion

**Global Average Temperature Change****7. Climate Change impacts in the UK**

Severe water shortages in the summer
Risk of flooding will double to 1.9 million people
Increase in sea levels by one metre and as much as two metres by coasts
Risks of accelerated coastal erosion
Increase in heat related deaths in the summer
Loss of food crops driving up food prices

**8. Managing global climate change**

Mitigation	Adaptation
Alternative energy	Agriculture
Carbon capture	Water supply
Planting trees	Reducing risk from sea level rise
International agreements	

**9. Sources of Energy**

Renewable	Non-renewable
Solar	Oil
Wind	Coal
Hydro-electric power (HEP)	Gas
Biomass	Nuclear
Geothermal	



## K.O. FIVE – BRITAIN 1945 TO THE PRESENT DAY

### 1. key features

Migration	Leaving the country that you live in
Immigration	Coming to live in a new country
Racism	Prejudice and discrimination against people due to skin colour and culture
Welfare State	Where the government looks after the health and well being of the nation
National Health Service	A publicly funded healthcare system of the UK
Public health	A government acting to prevent disease, prolong life and promote health

### 2. Migration

Pull factors	Offers of jobs and education in the UK e.g. in the armed services
Push factors	A lack of jobs in the Caribbean.
Nations involved	Mostly the Caribbean but also Poland and the Ukraine.
British Empire	The British government invited all Empire citizens to work and live in Britain after WW2.

### 3. Immigration

Housing	Often in the poorest areas of inner cities e.g. Notting Hill in London
Employment	Many returned to military service. Others took below the level of their qualifications
Worship	Many different faiths found solace in collective worship.

### 4. Windrush

Windrush	The name of the ship that brought the first immigrants from the Caribbean to dock at Tilbury, Essex in 1948.
Passengers	On board were almost 500 experienced labourers, cleaners, nurses etc, including one stowaway found a week into the journey.
Plans	Many of them did not plan on staying in the UK but intended to return to the Caribbean once there had been an economic recovery there.
Problems	The immigrants experienced racism from the white people in Britain. They were not made welcome in the country. In 1958 there were the Notting Hill Riots between the white 'Teddy Boys' and the Caribbean community.

### 5. Local History – Nottingham and Windrush

ACNA Centre	Afro Caribbean National Artistic Centre. Community based centre providing support and public information to the Caribbean community and beyond.
1212 Afro Caribbean food shop	Oldest Caribbean food store in Nottingham. Started in 1960 for the Windrush generation.
Windrush Day	Nottingham's annual celebration to recognise the achievements and contributions of the Windrush generation and their descendants.

### 6. Modern medicine and the NHS

Arguments FOR	Many poor people were falling ill and dying because they could not afford to see a doctor.
Arguments AGAINST	The British Medical Association did not like the idea. Doctors voted against it due to loss of wages.
SUCCESSSES	The health of the nation improved dramatically. Some people saw a doctor/ dentist for the first time ever. Hundreds of thousands of lives have been saved and people live on average 10 years longer.
PROBLEMS	So many medical problems were discovered that the government was forced to introduce a fee to pay for prescriptions. Today there are long waiting lists for surgery.

### 7.. Key concepts

Causation	The reasons why something happens
Consequence	The result of something happening
Similarity and difference	Thing that have characteristics that are mostly the same or mostly different
Change	A reform or departure from the usual
Continuity	When things stay the same

### 8. Timeline of key dates

1945	WW2 comes to an end
1948	The British Nationality Act
1948	The NHS is launched
22 <sup>nd</sup> June 1948	Windrush arrived in the UK
1968	UK's first heart transplant
1972	CT scanners used for the first time in the UK
5 <sup>th</sup> January 2018	NHS celebrates 80 years
22 <sup>nd</sup> June 2021	Nottingham celebrates Windrush Day



### What do I need to be able to do?

By the end of this unit you should be able to:

- Solve problems and explain direct proportion
- Use conversion graphs to make statements, comparisons and form conclusions
- Understand and use scale factors for length

### Keywords

**Proportion:** A statement that links two ratios

**Viable:** a part that the value can be changed

**Axes:** horizontal and vertical lines that a graph is plotted around

**Approximation:** an estimate for a value

**Scale factor:** the multiple that increases/decreases a shape in size

**Currency:** the system of money used in a particular country

**Conversion:** the process of changing one variable to another

**Scale:** the comparison of something drawn to its actual size

### Direct Proportion

As one variable changes the other changes at the same rate.



4 cans of pop = £2.40

50 × 4 cans of pop = £2.40  
2 cans of pop = £1.20

This is a multiplicative change

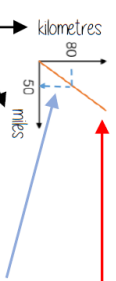
4 cans of pop = £2.40  
12 cans of pop = £7.20

This multiplier is the same in the same way that this would be for ratio

Sometimes this is easiest if you work out how much one unit is worth first  
eg 1 can of pop = £0.60

### Conversion Graphs

Compare two variables



This is always a straight line because as one variable increases so does the other at the same rate

To make conversions between units you need to find the point to compare — then find the associated point by using your graph  
Using a ruler helps for accuracy  
Showing your conversion lines help as a 'check' for solutions

### Conversion between currencies



£1 = 90 Rupees

For every £1 I have 90 Rupees

Currency can be converted using a conversion graph

£1 = 90 Rupees

£10 = 900 Rupees

Convert 630 Rupees into Pounds

£1 = 90 Rupees

630 ÷ 90 = 7

£7 = 630 Rupees

### Ratio between similar shapes



Angles in similar shapes do not change  
eg if a triangle gets bigger the angles can not go above 180°

The two rectangles are similar.

3m 8m

4.5m ?m

Corresponding sides

3m 4.5m  
1m 1.5m

8m 12m  
1m 1.5m

Note: Simplify to the same ratio

### Understand Scale Factor

The two rectangles are similar



This is a multiplicative change

3 × 15 = 4.5

Missing length

8 × 15 = 12m

Use corresponding sides to calculate a scale factor

Scale factor can also be calculated by  
Bigger corresponding side  
Smaller corresponding side

Small corresponding side × SF  
Big corresponding side ÷ SF

### Draw and interpret scale diagrams

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

For every 1cm on my image is 30cm in real life

The car image is 10cm

Image: 10cm  
Real life: 300cm

The car in real life is 210cm

Image: 7cm  
Real life: 210cm

### Interpret maps with scale factors

10 100 1000  
mm cm m km  
x 10 x 100 x 1000

1cm : 250m  
Ratios need to be in the same units

1cm : 250m  
1cm : 25000cm  
250 × 100 = 25000

For every 1cm on my map is 25000cm in real life





### What do I need to be able to do?

By the end of this unit you should be able to:

- Simplify into a given ratio
- Share an amount in a given ratio
- Solve ratio problems given a part

Solutions should be modelled, explained and solved.

### Keywords

**Ratio:** A statement of how two numbers compare

**Equal parts:** all parts in the same proportion, or a whole shared equally

**Proportion:** a statement that links two ratios

**Order:** to place a number in a determined sequence

**Part:** a section of a whole

**Equivalent:** of equal value

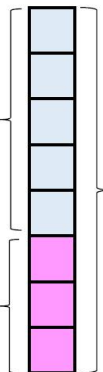
**Factors:** integers that multiply together to get the original value

**Scale:** the comparison of something drawn to its actual size

### Representing a ratio

For every 5 bags there are 3 gits\*

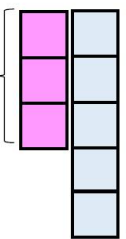
This is the 'whole' – bags and gits together



This represents the 5 bags

This represents the 3 gits

5:3



This represents the 5 bags

Double Number Line

### Order is Important

For every dog there are 2 cats\*



Dogs



Cats

1:2

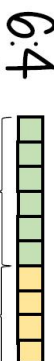
The ratio has to be written in the same order as the information is given

eg 2 I would represent 2 dogs for every 1 cat X

### Simplifying a ratio

Cancel down the ratio to its lowest form

For every 6 days of rain there are 4 days of sun\*



÷ by 2

3:2

For every 3 days of rain there are 2 days of sun\* – when this happens the ratio becomes 6:4

Find the biggest common factor that goes into all parts of the ratio

For 6 and 4 the biggest factor (number that multiplies into them is 2)

### Ratio In (or n:1)

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

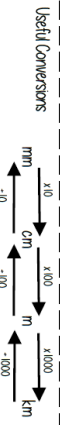
Show the ratio 4:20 in the ratio of In

The question has to be divided by 4 (100 – to keep n) 1:5 proportion

Therefore Divide by 4 \*If the n part does not have to be an integer for the type of question

### Units are important:

When using a ratio – all parts should be in the same units



### Sharing a whole into a given ratio

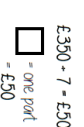
James and Lucy share £350 in the ratio 3:4  
Work out how much each person earns

#### Model the Question

James: Lucy  
3 : 4



Find the value of one part  
Whole: £350  
7 parts to share between  
(3 James, 4 Lucy)



Put back into the question

James: Lucy  
James = 3 x £50 = £150  
Lucy = 4 x £50 = £200



### Finding a value given In (or n:1)

Inside a box are blue and red pens in the ratio 5:1  
If there are 10 red pens how many blue pens are there?

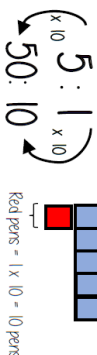
#### Model the Question

Blue: Red  
5 : 1



Put back into the question

Blue pens = 5 x 10 = 50 pens



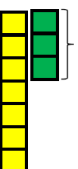
There are 50 Blue Pens

### Ratio as a fraction

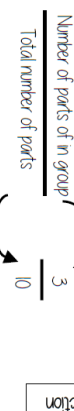


Trees: Flowers

3 : 7

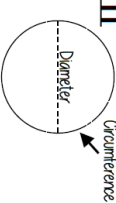


There are 3 parts for trees



Tree parts 3 • Flower parts 7 = 10

### PII



The ratio of a circles circumference to its diameter

### What do I need to be able to do?

By the end of this unit you should be able to:

- Name 2D and 3D shapes
- Recognise Prisms
- Sketch and recognise nets
- Draw plans and elevations
- Find areas of 2D shapes
- Find Surface area for cubes, cuboids, triangular prisms and cylinders
- Find the Volume of 3D shapes

### Keywords

**2D:** two dimensions to the shape e.g. length and width

**3D:** three dimensions to the shape e.g. length, width and height

**Vertex:** a point where two or more line segments meet

**Edge:** a line on the boundary joining two vertex

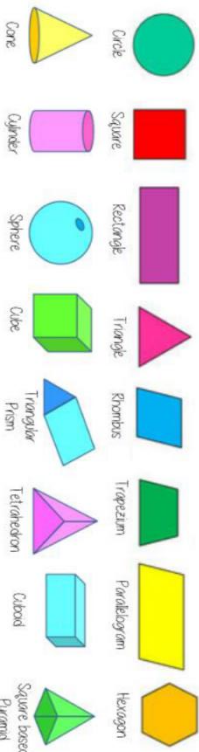
**Face:** a flat surface on a solid object

**Cross-section:** a view inside a solid shape made by cutting through it

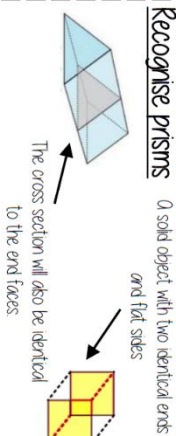
**Plan:** a drawing of something when drawn from above (sometimes birds eye view)

**Perspective:** a way to give illustration of a 3D shape when drawn on a flat surface

### Name 2D & 3D shapes

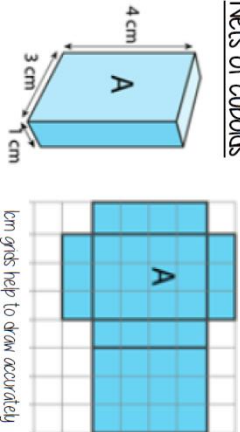


### Recognise prisms



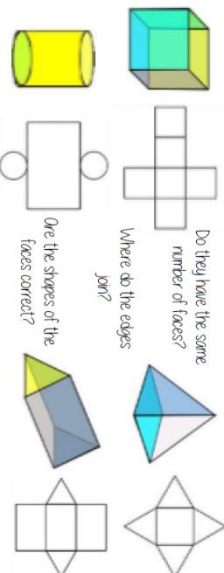
A cylinder although with very similar properties does not have flat faces so is not categorised as a prism

### Nets of cuboids

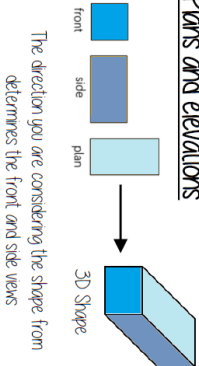


Visualise the folding of the net. Will it make the cuboid with all sides touching

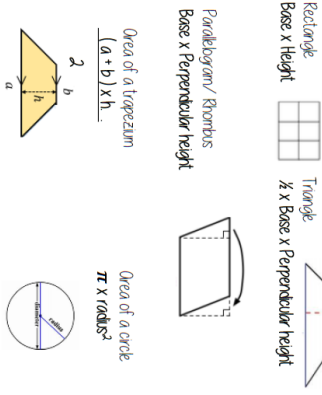
### Sketch and recognise nets



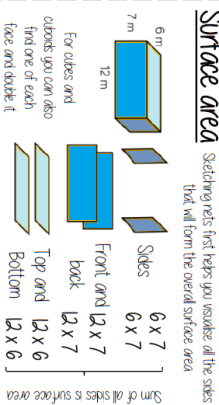
### Plans and elevations



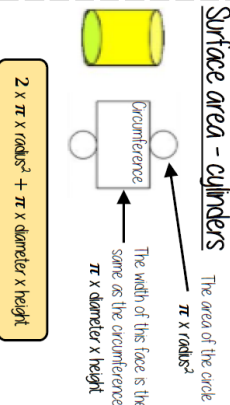
### Area of 2D shapes



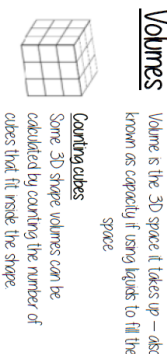
### Surface area



### Surface area - cylinders

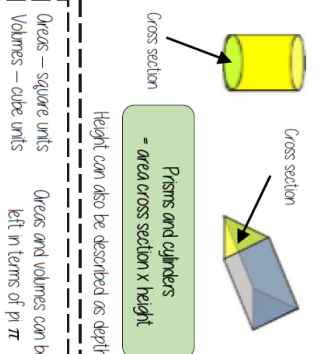


### Volumes



### Cubes/ Cuboids - base x width x height

Remember multiplication is commutative





### What do I need to be able to do?

By the end of this unit you should be able to:

- Understand and use mean, median and mode
- Choose the most appropriate average
- Identify outliers
- Compare distributions using averages and range

### Keywords

**Spread:** the distance/how spread out/variation of data

**Average:** a measure of central tendency – or the typical value of all the data together

**Total:** all the data added together

**Frequency:** the number of times the data value occur

**Represent:** something that show's the value of another

**Outlier:** a value that stands apart from the data set

**Consistent:** a set of data that is similar and doesn't change very much

### Mean, Median, Mode

The Mean

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

24, 8, 4, 11, 8

Find the sum of the data (add the values) 55

Divide the overall total by how many pieces of data you have  $55 \div 5$

Mean = 11

The Median

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

24, 8, 4, 11, 8

Put the data in order

4, 8, 8, 11, 24

Find the value in the middle

4, 8, 8, 11, 24

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

Median = 8

The Mode (The modal value)

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

24, 8, 4, 11, 8

This can still be easier if the data is ordered first

4, 8, 8, 11, 24

Mode = 8

### Choosing the appropriate average

The average should be a representative of the data set – so it should be compared to the set as a whole - to check if it is an appropriate average

Here are the weekly wages of a small firm

£240	£240	£240	£240	£240
£260	£260	£300	£350	£700

Which average best represents the weekly wage?

The Mean = £307

The Median = £250

The Mode = £240

Put the data back into context

Mean/Median – too high (most of the company earn £240)

Mode is the best average that represents this wage

It is likely that the salaries above £240 are more senior staff members – their salary doesn't represent the average weekly wage of the majority of employees

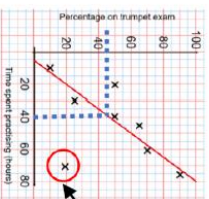
### Identify outliers

Outliers are values that stand well apart from the rest of the data

Outliers can have a big impact on range and mean  
They have less impact on the median and the mode

Height in cm  
152 150 142 158 182 151 153 149 156 160 151 144

Sometimes it is best to not use an outlier in calculations



Where an outlier is identified try to give it some context.  
This is likely to be a taller member of the group.  
Could the be an older student or a teacher?

Outliers can also be identified graphically e.g. on scatter graphs

### Comparing distributions

Comparisons should include a statement of average and central tendency, as well as a statement about spread and consistency

Here are the number of runs scored last month by Lucy and James in cricket matches

Lucy: 45, 32, 37, 41, 48, 35

James: 60, 90, 41, 23, 14, 23

Lucy  
Mean: 39.6 (1dp), Median: 38 Mode: no mode, Range: 16

James

Mean: 41.8 (1dp), Median: 32, Mode: 23, Range: 76

James has two extreme values that have a big impact on the range

\* James is less consistent than Lucy because his scores have a greater range.

Lucy performed better on average because her scores have a similar mean and a higher median

Où vas-tu en vacances ?



D'habitude je vais en vacances en France pour une semaine avec mes parents à mon avis c'est génial		1	Usually I go on holiday to France for a week with my parents in my opinion it is great!
 Nous voyageons en avion car c'est rapide mais je préférerais voyager en ferry car j'adore la mer		2	we travel by plane because it is fast but I would prefer to travel by boat because I love the sea.
Normalement nous restons dans un camping au bord de la mer ce que je trouve vraiment nul !		3	Normally we stay in a campsite by the seaside which I find really rubbish!
 En général, je vais à la plage tous les jours. Parfois, je fais de la planche à voile ou je joue au volley, c'est reposant		4	In general, I go to the beach every day Sometimes, I do <u>sailing</u> or I play volleyball, it's relaxing.
Par contre l'année dernière, je suis allée aux alpes pendant une semaine avec mes amis		5	However, last year, I went to the Alps for a week with my friends
 J'ai visité un grand lac et j'ai fait beaucoup de sports d'hiver		6	I visited a big lake and did lots of winter sports
J'ai fait du ski tous les jours avec mon meilleur ami, j'adore ça c'est mon sport préféré.		7	I did <u>skiing</u> every day with my best friend, I love that it's my favourite sport.
cependant à la fin des vacances c'était un peu fatigant		8	However at the end of the holiday it was a bit tiring.
 L'année prochaine, je vais aller à Marseille avec mes grand-parents et mes cousins		9	Next year, I am going to go to Marseille with my grand-parents and my cousins
Nous allons rester dans un hôtel de cinq étoiles avec une grande piscine et des bons restaurants		10	We are going to stay in a five star hotel with a big swimming pool and good restaurants.
 J'aimerais voir le vieux-port et visiter les marchés, ça sera vraiment cool		11	I would like to see the old port and visit the markets, that will be really cool.
Si je pouvais je visiterais aussi la cathédrale et je mangerais la bouillabaisse		12	If I could I would <u>visit</u> also the cathedral and I would eat bouillabaisse



## YEAR 8 FRENCH - LES VACANCES!

## A. LES PAYS

En Angleterre	to England
En France	to France
En Espagne	to Spain
En Italie	to Italy
En Allemagne	to Germany
en Australie	to Australia
En Irlande	to Ireland
au Pays de Galles	to Wales
Au Portugal	to Portugal
Aux Etats- Unis	to the USA



## C. COMMENT VOYAGES-TU?

Je voyage en...	I travel by..
Avion	Plane
Bateau / ferry	Boat / ferry
Voiture	Car
Car	coach



## ALLER

## TO GO

Je vais	I go
Tu vas	You go
Il / elle / on va	He /she /one goes
Nous allons	We go
Vous allez	You go
Ils / elles vont	They go

## D. OÙ LOGES-TU?

Je loge dans	I stay in
Nous logeons dans	We stay in
Un hôtel (de cinq étoiles)	A (five star) hotel
Une caravane	A caravan
Un camping	A campsite
Un appartement	An apartment



Chaque été nous allons en France avec mes grand-parents. Je voyage en ferry et je loge dans une caravane, c'est genial!

Souvent je fais de la voile, c'est vraiment chouette!



## E. LES ACTIVITÉS

Je fais de la natation / je nage	I do swimming / I swim
Je fais des sports aquatiques	I do water sports
Je vais à la plage	I go to the beach
Je mange la cuisine locale	I eat local food
Je visite des sites touristiques	I visit the sights
Je vais au marché	I go to the market
Je danse dans les boîtes	I dance at nightclubs

## YEAR 8 FRENCH - LES VACANCES

**The Perfect Tense (le passé composé)**

This is used to describe a completed action in the past,  
e.g: **I played** football last week.

SUBJECT	AVOIR	PAST PARTICIPLE
I have You have He/she has We have You have They have	j' tu il/elle nous vous ils/elles	ai as a avons avez ont
		-er' verbs - Remove r - Add an accent on the last e → é -ir' verbs - Remove r -re' verbs - Remove re - Add u

**JE SUIS ALLÉ(E) – I WENT**

J'AI VISITÉ	I VISITED
J'AI LOGÉ	I STAYED
J'AI MANGÉ	I ATE
J'AI NAGÉ	I SWAM
J'AI JOUÉ	I PLAYED

L'année dernière je suis allé en  
Allemagne et j'ai visité le  
musée, c'était vraiment cool!

**Connectives**

et	and	car	because
mais	but	parce que	because
ou	or	cependant	however

**Near future tense (Going to ...)**  
This is formed by using the verb 'aller' +  
the infinitive

Je vais  
Tu vas  
Il / elle va  
Nous allons  
Vous allez  
Ils / elles vont



Manger – to eat  
Jouer – to play  
Aller – to go  
Boire – to drink  
Faire – to do  
Visiter – to visit  
Danser – to dance  
Regarder – to watch



Dans l'avenir, je vais aller au pays  
de galle et je vais faire des  
promenades à la campagne, ce  
sera tout à fait sensass!

**OPINIONS**

Génial	great
Sensass	amazing
Cool	cool
Rapide	quick
Confortable	comfortable
branché	trendy
nul	rubbish
terrible	terrible
affreux	awful
ennuyeux	boring



## Definitions

## The Definition...

\*Much of the music in the charts is seen as 'pop' music. Pop music means music that is 'popular!' - people are buying it and it has popular appeal and a general audience

\*Much pop music has been professionally produced, marketed well, promoted by concert and radio programmes such as *Radio 1* and provided by record companies to make money

\*A 'hit' is a song that sells many copies and latest hits are listed in the *charts*. To get in the charts, a song must be released as a *single*

\*Pop music changes over time.

\*Pop music incorporates many styles such as R and B, rap, funk, soul, dance, rock and country

\*Michael Jackson is often referred to as the King of Pop and Madonna as the Queen of Pop



## Brit Pop...

Britpop is a type of rock music that came out of the British Indie music scene of the 1990s. Indie is a word that is short for independent. When people talk about indie music, they mean music that is created independently from major record labels. In the 90s, there was a huge chart battle between two bands called Blur and Oasis. It was nicknamed 'The Battle of Britpop.'



Best selling hits—you decide. Listen to:

Oasis—*Wonderwall*, *Don't Look Back in Anger*, *Half the World Away*

Blur—*Coffee and TV*, *Girls and Boys*, *Song 2*



## Key music and artists to listen to...

1980s

Whitney Houston—I Wanna Dance with Someone

Madonna—Crazy For You

Michael Jackson—Billie Jean

1990s

Spice Girls—Wannabe

Britney Spears—Hit Me Baby One More Time

Backstreet Boys—Everybody

2000s

Beyonce—Single Ladies

Black Eyed Peas—I Gotta Feeling

2010s

Daft Punk—Get Lucky

Ed Sheeran—Shape of You

## How to compose pop/rap music

## The Pop Music Formula...

Songs have a good rhythm, a catchy melody, are easy to remember and sing along to

Songs usually have a chorus that repeats several times and two or more verses

Songs are between 2 and 5 minutes long

The lyrics are usually about love and relationships

Pop stars have a style that teenagers associate with

## Pop/Rap Awards

## Brit Awards...

There are many music awards that celebrate musical achievement. The BRIT Awards celebrate British popular music. In 2020, **Stomzy** won the award for Best Male Solo artist and **Mabel** for Best Female Solo artist. **Lewis Capaldi** won awards for Best Song of the Year with *Someone You Loved* and also Best New Artist. Ten years ago, **Dizzee Rascal** and **Lily Allen** won the award for Best Male and Female Solo artists. The BRIT Awards have been going since the 70s. **Robbie Williams** holds the record for the most BRIT Awards.







### X Factor Performance Task

- ✓ Decide whether you are going to perform as a group, or solo.
- ✓ Practise and rehearse at home, ready to give a good X Factor performance.
- ✓ Perform something that you are confident with.

### What does 'timbre' mean?

- ❖ Timbre is the tonal quality and sound of an instrument.

### Key Words

Articulation: how certain notes or passages are sung or played.

Fluency: performing music accurately, quickly and with expression.

Diction: how a singer vocalises and pronounces the words of a song.

Interpretation: how a performer will present the material and how emotions are communicated through the performance.

## Music Performance

'To play a wrong note is insignificant; to play without passion is inexcusable.'

Ludwig Van Beethoven

### Music Performance Tips

- ✓ Your performance does not have to be perfect.
- ✓ Keep going.
- ✓ Practice makes perfect!
- ✓ Be confident and let loose.
- ✓ Be unique.



### How am I being assessed?

- Accuracy of performance.
- Communication and teamwork.
- Interpretation and fluency of music.
- Technical control of an instrument.

### What does '**intonation**' mean?

- ❖ Intonation is the pitch accuracy of the instrument.

### What does '**timing**' mean?

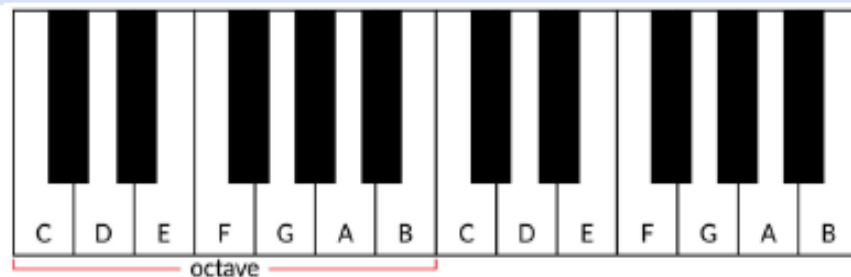
Timing is the ability to keep in time and accurately perform a rhythm.

### Why is constructive criticism important?

- ✓ It helps you to improve.
- ✓ It helps you to identify what to improve.
- ✓ It is crucial to share opinions with others.
- ✓ Verbal feedback is essential to help support and develop as a musician.

# KEYBOARD SKILLS

## A. Layout of a Keyboard/Piano

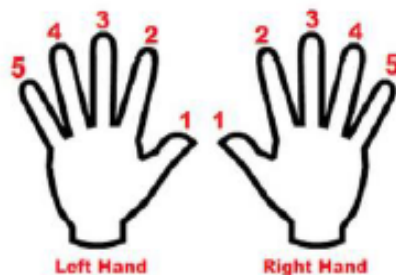


A piano or keyboard is laid out with **WHITE KEYS** and **Black Keys** (see section G). C is to the left of the two Black Keys and the notes continue to G then they go back to A again. Notes with the same letter name/pitch are said to be an **OCTAVE** apart. **MIDDLE C** is normally in the centre of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

## D. Keyboard Functions



## E. Left Hand/Right Hand (1-5)



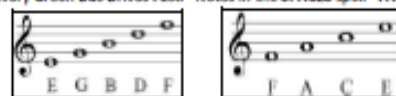
## Exploring Treble Clef Reading and Notation

## B. Treble Clef & Treble Clef Notation

A **STAVE** or **STAFF** is the name given to the five lines where musical notes are written. The position of notes on the stave or staff shows their **PITCH** (how high or low a note is). The **TREBLE CLEF** is a symbol used to show high-pitched notes on the stave and is *usually* used for the right hand on a piano or keyboard to play the **MELODY** and also used by high pitched instruments such as the flute and violin. The stave or staff is made up of 5 **LINE**s and 4 **SPACE**s.



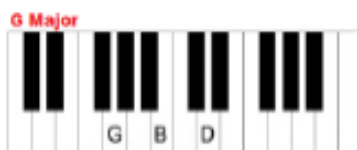
Every Green Bus Drives Fast. Notes in the SPACES spell "FACE"



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



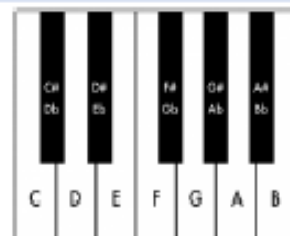
## C. Keyboard Chords



Play one - Miss one - play one - miss one - play one

## F. Black Keys and Sharps and Flats

There are five different black notes or keys on a piano or keyboard. They occur in groups of two and three right up the keyboard in different pitches. Each one can be a **SHARP** or a **FLAT**. The **#** symbol means a **SHARP** which raises the pitch by a semitone (e.g. **C#** is higher in pitch (to the right) than C). The **b** symbol means a **FLAT** which lowers the pitch by a semitone (e.g. **Bb** is lower in pitch (to the left) than B). Each black key has 2 names - **C#** is the same as **Db** - there's just two different ways of looking at it! Remember, black notes or keys that are to the **RIGHT** of a white note are called **SHARPS** and black notes to the **LEFT** of a white note are called **FLATS**.



## Musical knowledge : Listening

When you are listening to a piece of music:

- Does it sound **happy** (major tonality) or **sad** (minor tonality)?
- Which **instruments** can you hear?
- How would you describe the **rhythm**?
- What are the **key features** of the piece?
- Which words could you use to describe the **tempo**? Is it fast or slow?

### Question using key words

How are **melodies** used? Are they simple or complex?

- Are the notes high or low in **pitch**? Do the notes make sudden leaps or move in small steps?
- Are the **dynamics** (volume) loud or soft?
- How would you describe the **structure**? How many different sections of music can you hear?
- How would you describe the **style** of music? Which **genre** of music would you describe it as?



## LISTENING SKILLS

### Appraisal

*'an act of  
assessing  
something.'*

**"What am  
I  
hearing?"**

## Definitions

### T.DRIPS

Use **TDRIPS** –

**Tempo, Dynamics, Rhythm, Instrumentation, Pitch, Structure** to describe music.

## Key words Notes



**Tempo** Fast Slow **Allegro** **Lento**  
**Dynamics** Forte Piano  
**Rhythm** Straight Syncopated  
**Instrumentation**  
**Pitch** Treble Clef Bass Clef High or Low  
**Structure** Strophic Ternary Rondo



## Table Tennis

### Key Words:

Attack  
Block  
Reaction  
Deceive  
Positioning

### Skills:

Serve  
Forehand  
Backhand  
Topspin  
Backspin

### Famous table tennis players:



Ma Long



Desmond Douglas

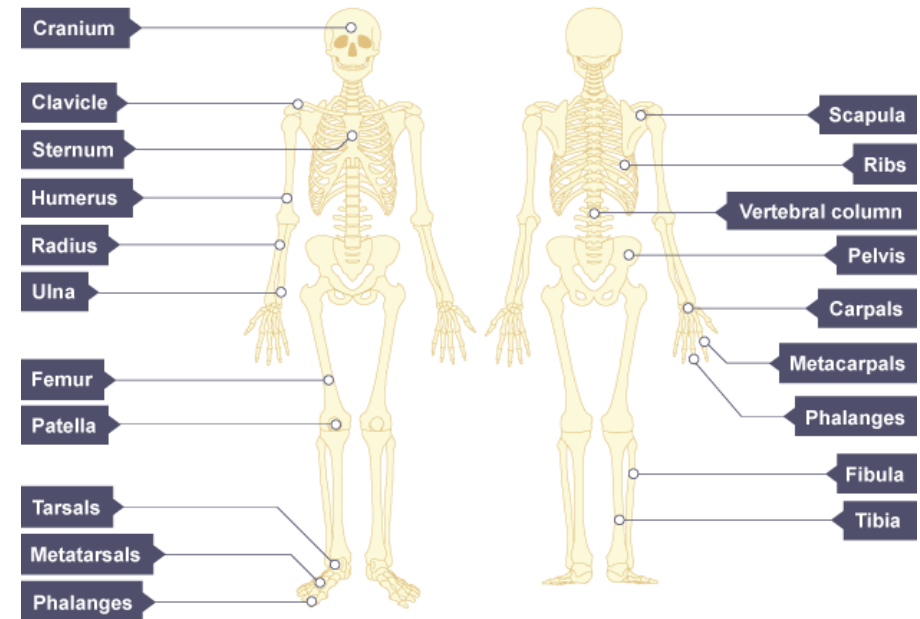
### Ready Position:

- Be positioned in the middle of the table
- Hold the bat with one hand using the hand shake grip
- Your feet need to be shoulder width apart
- Knees need to be bent so you are lower to the table
- As your opponent strikes the ball you need to bounce so that you are in the best position to react to the ball
- After striking the ball, you need to return to the ready position as soon as possible.

### Service Rules:

- The ball must be 'presented' to your opponent so that they can see it during the entire serving action
- The ball must be held in the flat of your palm to prevent any additional spin being applied
- The ball must be thrown up at least 6 inches before striking it
- The ball must bounce on your side of the table and then on your opponent's side of the table
- In singles, you can serve the ball to any part of the table
- You only get one chance to serve. If you miss the table, miss the ball, or hit the net then you lose the point
- If a let occurs then you may retake your serve

## Skeletal System



## Classification of Bones

### 1. Long

A bone that is longer than it is wide. E.g. femur

### 2. Short

Weight bearing bones which are roughly the same size in length, width and thickness. E.g. carpals

### 3. Flat

Protect the vital organs in the body. E.g. ribs

### 4. Irregular

Odd shaped bones which protect. E.g. vertebral column

## Striking and Fielding

### Skills:

**Throwing**—a high elbow, the correct grip of the ball and power through the arm, achieves an effective throw

**Catching**—you can get someone out by catching their hit or by stumping them at a post after catching the ball. Get in position under the ball, hands in a cup shape. Bring the ball close into the body to ensure it is not dropped.

**Fielding**—using different techniques in order to get the ball back to the bowler or to a post e.g long barrier fielding for stopping the ball low

**Batting**—Stand sideways on to the bowler with the bat up and behind you. Swing through the hips and follow through with the swing. Move body and arm position to hit to a different area.

**Underarm bowling**—hold ball in dominant hand, step towards with opposite leg, swing arm to release the ball before shoulder height. Aim for the backstops hands.

### Ball and socket

#### Rules:

You must start in the batting box and not step out of it. You only get 1 ball bowled at you, after which you must run whether you hit it or not.

You must keep in contact with a post once you have decided to stop.

A no ball is—above the batters head, below the knee, the wrong side of the body, too wide and too close into the body.

If you hit a ball behind, then you must wait at first post until the ball comes forward of the batting box. You may then run.

If you hit the ball and get all the way around you score 1 Rounder.

If you get to 2nd post you score 1/2 rounder.

If you do not hit the ball but get all the way round you score 1/2 a rounder. You also score 1/2 rounder if you get 2 no balls bowled at you.

You get 1/2 a rounder for obstruction if the fielders get in the way of your run to a post.

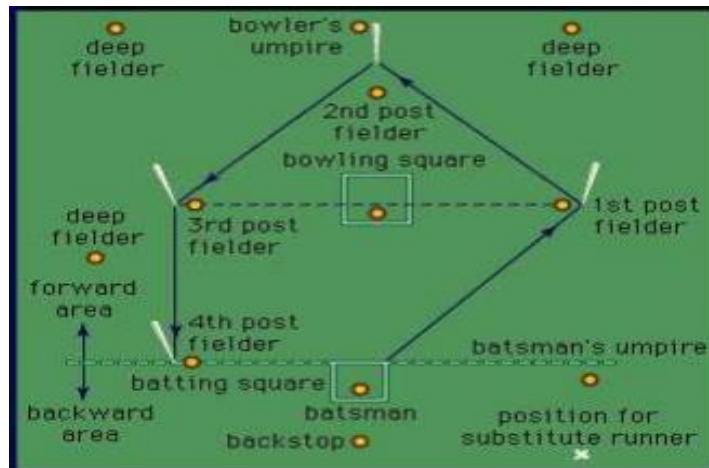
### Famous rounders : Lizzie Beaver players:



### Key Words:

Technique  
Reactions  
Awareness  
Decision  
Fingers ready  
Catching  
Throwing  
Overarm  
Bowling  
Batting  
Fielding  
Coordination

A team consists of 15 players maximum and 6 minimum, but only 9 player on the field at any one time.



## Skeletal System

### Skeletal System – Classification of joints

#### 1) Hinge Joints

This includes the knee and elbow. Allow flexion and extension movement to occur for example kicking a football

#### 2) Ball and socket joints

This includes the hip and the shoulder. They allow abduction, adduction and rotation. For example abduction from shoulder when serving in tennis

#### 3) Pivot

This is found in the neck – for example turning your head to look for the next pass in netball.

### Type of movement

#### Joints that provide it

**1) Flexion**— bending movement that decreases the angle between body parts  
Shoulder, hip, elbow

**2) Extension**— straightening movement that increases the angle between body parts

Shoulder, hip

**3) Adduction**—movement that pulls towards the midline of the body  
Shoulder, hip

**4) Abduction**—movement that pulls away from the midline of the body  
Shoulder, hip

**5) Rotation**—movement around a single axis or pivot point  
Shoulder, hip

**6) Circumduction**—moving in a circular shape  
Shoulder, hip

**7) Dorsi—flexion**—bending or flexin the toes up, closer to the shin  
Ankle

### Examples in sport

Someone working out in the gym bends their arms when doing a bicep curl

A swimmer swings the arm backwards preparation for a racing dive

A golfer on the tee swings the club down towards the ball

A gymnast moves their arms out sideways at the shoulder when performing 'the crucifix' on the rings

A tennis

A cricketer bowls a ball

A sprinter positions their feet in the starting blocks

**8) Plantar –flexion**—extending or pointing the toes down, away from the shin  
Ankle

A floor gymnast points their toes

# Rugby

Key Words	
1	Lineout
2	Scrum
3	Try
4	Penalty
5	Pass
6	Conversion

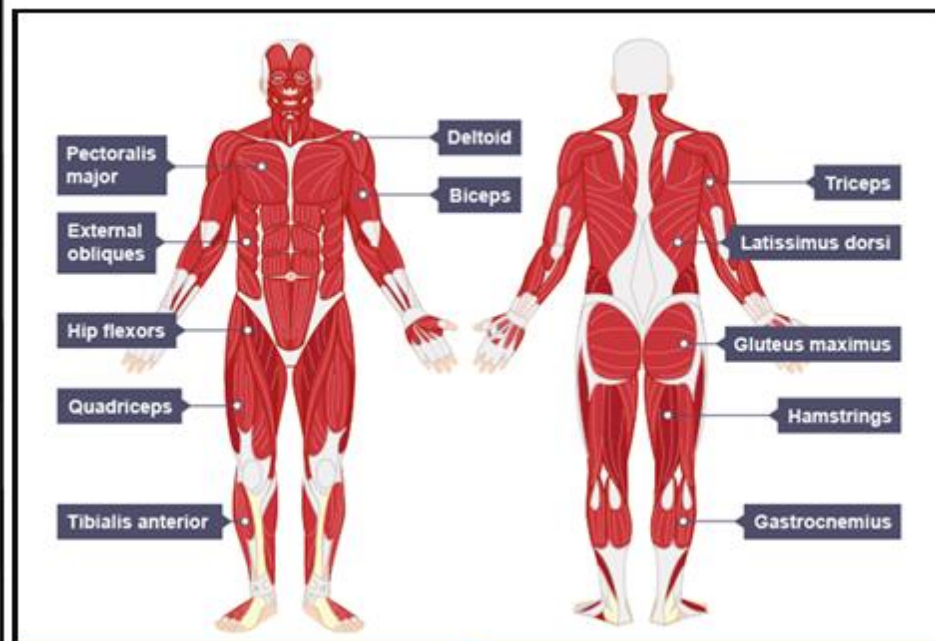


## Key Skills

1	<b>Grubber Kick</b>	The grubber kick is a simple low kick that aims to move the ball past defences for attacking players to try and retrieve. It is very good at breaking defensive positions and forces defenders to turn around and chase
2	<b>Spin pass</b>	A spin pass enables a team to quickly pass a ball and help maintain possession.
3	<b>High ball catch</b>	A high ball catch is an attacking and defending skill. It is useful for attackers when completing an up and under kick or as a defender to stop an attacking team's momentum by safely winning possession back
4	<b>Drop Kick</b>	A drop kick is when a player kicks the ball from hand and the ball touches the ground between being dropped and kicked. If a drop

## Lineouts

1	A lineout is called if the ball travels past the side-line
2	A lineout consists of up to seven players and players can be lifted in order to catch the ball
3	At a lineout, both teams can compete to win the ball



## Antagonistic Muscle Pairs

One muscle relaxes for the other to contract. Examples:

Muscle 1	Muscle 2
Biceps	Triceps
Hamstrings	Quadriceps
Gluteus maximus	Hip flexors
Gastrocnemius	Tibialis anterior

## Muscle Fibres

	Type I	Type IIa	Type IIx
Speed of contraction	Slow	Fast	Very fast
Force produced	Low	Medium	High
Resistance to fatigue	High	Medium	Low

# Muscular System



**Key Words:**

Routine  
Contacts  
Rotation  
Difficulty  
Execution

**Skills:**

Full Twist  
Seat Drop  
Front Drop  
Back Drop  
Front Somersault

**Famous trampolinists:**

Karen Cockburn



Dong Dong

## Trampolining

Trampoline Moves

Tuck Jump  
Straddle Jump  
Pike Jump  
Half Twist  
Full Twist  
Seat Drop  
Front Drop  
Back Drop  
Turntable  
Cradle  
Cat Twist  
Seat to Front Drop  
Back to Front Drop  
Front Somersault  
Back Somersault

Trampolining is a competitive gymnastic sport

Rules

A competitor performs a routine of various moves.

Competitors must make only 10 contacts with the trampoline bed.

Competitors can only land on their feet, front, back, or in a seat position.

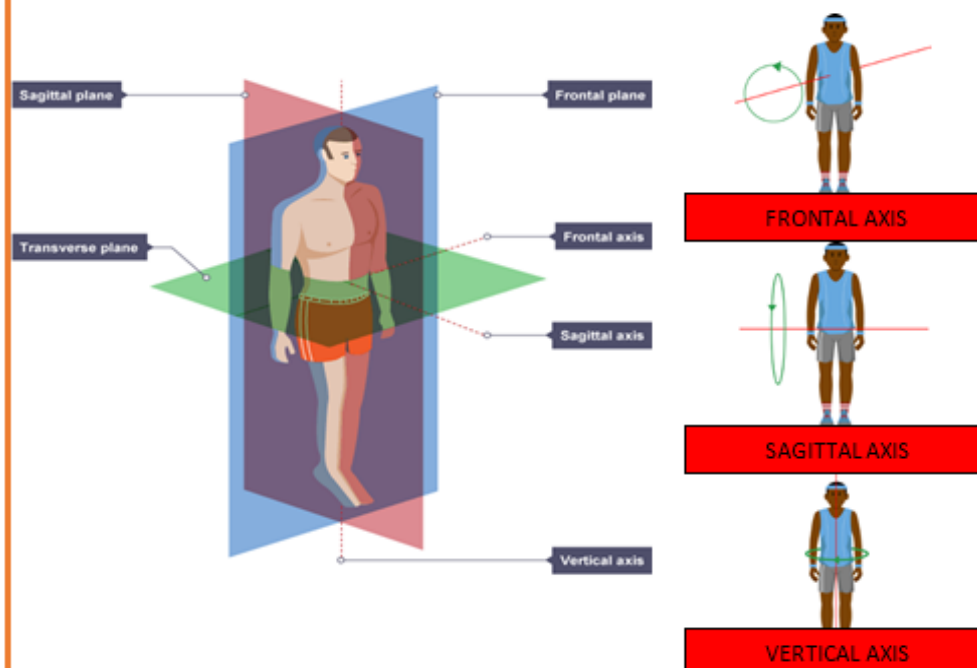
History of Trampolining

In the early 1930s, an American man, named George Nissen, observed trapeze artists perform a series of exciting tumbling tricks when bouncing on the safety net.

This experience inspired him and his friend, Larry Griswold, to build the first ever trampoline.

## Movement Analysis

Type of Plane	Movement Available
Sagittal	Divides the left and right side of the body, vertically.
Frontal	Divides the front and the back of the body, vertically.
Transverse	Divides the top and bottom of the body, horizontally.



## Netball

### Key Words:

Opponent  
Contact  
Over-a-third  
Feeding  
Possession

### Skills:

Passing  
Catching  
Footwork  
Attacking  
Defending  
Shooting

### Famous netball players



Layla Guscoth



Beth Cobden

### "When does contact occur?"

- When a player uses any part of the body to limit an opponent's ability to move freely.
- Knocking or hitting a player.
- Placing hands on the ball when held by an opponent.
- Removing the ball from an opponent's possession.
- While holding the ball, pushing it into an opponent.

A netball game lasts for 60 minutes.

This is split into 4 quarters, with each quarter lasting 15 minutes.

### OVER A THIRD!

The ball cannot be thrown over a complete third of the court without being touched or caught by a player.

### Netball Court Positions



### The Role of the Positions:

**GK**—To work with the GD and to prevent the GA/GS from scoring.

**GD**—To win the ball and reduce the effectiveness of the GA.

**WD**—To look for interceptions and prevent the WA from feeding into the circle.

**C**—To take the centre pass and to link the defence and the attack.

**WA**—To feed the circle players giving them shooting opportunities.

**GA**—To feed and work with GS to score goals.

**GS**—To score goals and work in and around the circle.

## Components of Fitness

### Health Related Components

Cardiovascular Fitness	The ability to exercise the entire body for long periods of time without tiring
Muscular Endurance	The ability to use voluntary muscles many times without getting tired
Muscular Strength	The amount of force a muscle can exert against resistance
Flexibility	The range of movement possible at a joint
Body Composition	The relative ratio of fat mass to fat-free mass in the body

### Skill Related Components

Agility	The ability to change the position of the body quickly while maintaining control of the movement
Balance	The ability to retain the body's centre of mass above the base of support
Coordination	The ability to use two or more body parts together
Reaction Time	The time it takes to respond to a stimulus
Power	The ability to do strength performance quickly (power = strength x speed)
Speed	The amount of time it takes to perform a particular action

**Key Words:**

Interval  
Weight  
Continuous  
Plyometric  
Circuit  
Fartlek

**Skills:**

Lifting  
weights  
  
Running for  
long periods  
  
Sprinting  
  
Jumping

**Health and Fitness**

Fitness Test	Component of fitness measured
12 minute cooper run	Cardiovascular Fitness
Vertical jump test	Power
30 metre sprint test	Speed
Illinois Agility test	Agility
Sit and reach test	Flexibility
Sit up test	Muscular Endurance
Hand grip dynamometer	Muscular Strength

A good level of fitness is important to maintain good cardiovascular health. This is the ability of the heart to pump blood around the body.

1	Cardiovascular Fitness	The ability of the heart, lungs and blood to transport oxygen
2	Power	The ability to perform strength performances quickly
3	Speed	The ability to put body parts into motion quickly
4	Agility	The ability to change the position of the body quickly and control the movement
5	Flexibility	The range of motion (ROM) at a joint
6	Muscular Endurance	The ability to use voluntary muscles repeatedly without tiring
7	Muscular Strength	The amount of force a muscle can exert against a resistance

**Training Methods**

1	Interval	Periods of exercise followed by periods of rest.
2		For example, sprint for 30m and then rest for ten seconds, before doing it again.
3		This is good for games players who require short bursts of sprinting.
4	Weight	This involves resistance training using weights aiming at improving strength and endurance of muscles.
5		You do a series of repetitions which makes up a set.
6		This is good for sprinters who want to build muscle.
7	Continuous	This involves aerobic activity for long periods of time without stopping e.g. cycling, running, swimming.
8		To be classed as continuous training, the period of exercise must be 12 minutes without stopping.
9		This is good for long distance runners if the activity is running.
10	Plyometric	This is high intensity training where the athlete performs a series of explosive jump movements, lengthening and then shortening the leg muscles.
11		This is good for basketball and volleyball players who will benefit from jumping high.
12	Circuit	This involves performing a series of activities in a circuit to develop either aerobic or anaerobic fitness.
13		This is good for all sports, depending on what is in the circuit.
14	Fartlek	This is also known as speed play.
15		It involves working at different speeds across different terrains and distances. E.g. walk, jog, sprint
16		This is good for games players where different speeds are required.





## Football

### Key Words:

1. Dummy
2. Cruyff Turn
3. Drag back
4. Swerve
5. Curl
6. One-touch
7. Pass and move
8. Jockeying
9. Step overs
10. Nutmeg

### Formations:

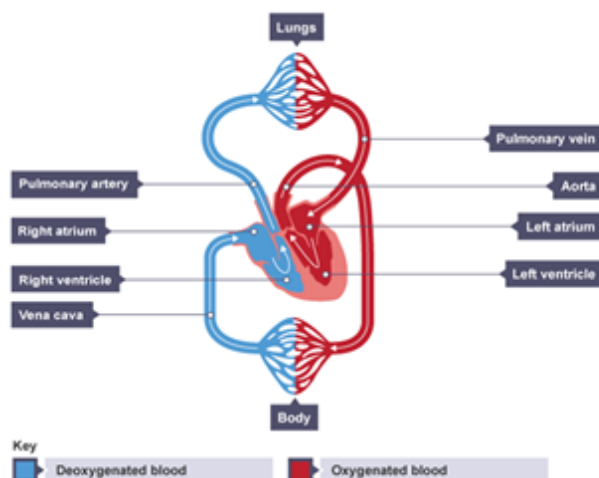
Formations will alter to suit a team's strengths/ counter an opponent's threat



Key Skills		
1	Short pass	A short side foot pass enables a team to quickly pass a ball and help maintain possession. It is used for accuracy
2	Long pass	A long pass is an attacking skill that allows players to switch the direction of the attack very quickly to create space, find a team-mate or to catch out the opposition.
3	Control	Good control of the football is an essential skill to maintain possession of the ball from the opposition and, if done accurately, gives the player more time to make the correct next decision
4	Block tackle	The block tackle is an essential skill for winning the ball back in football. It is mainly used when confronting an opponent head on and it is important to complete it with good timing and technique to prevent
5	Throw-in	The throw-in is the legal way to restart the game if the ball has gone out of play from either of the side-lines
6	Heading	The header can be an attacking or defensive skill and is used to try and win the ball when it is in the air

Striking the ball		
Chip	The player strikes the ball at the bottom and the ball goes over a player	
Lob	A player strikes a bouncing ball from underneath the ball, sending it over a player	
Curl	The player strikes the ball with the inside of their foot hitting the ball lightly to the side to create a curve	
Swerve	The player strikes the ball with the outside of their boot to create swerve	

## Cardiovascular System



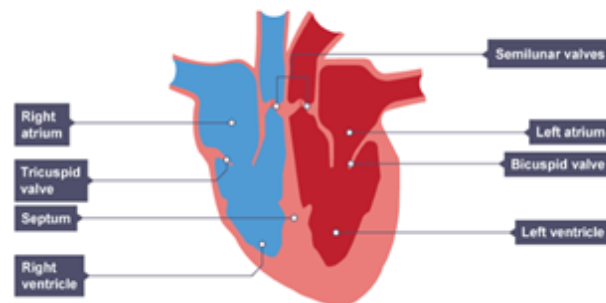
Key

Deoxygenated blood

Oxygenated blood

**Blood Pressure:** when heart contracts it pushes the blood into blood vessels which creates blood pressure.

1. Systolic value – blood pressure whilst the heart is contracting
2. Diastolic value – blood pressure whilst the heart is relaxing



### Key Words

1	Artery	carries blood away from the heart (usually oxygenated blood, except for the pulmonary artery).
2	Vein	carries blood back to the heart (usually deoxygenated blood, except for the pulmonary vein)
3	Capillary	allows diffusion of gases and nutrients from the blood into the body cells
4	Heart Rate (HR):	number of times the heart beats per minute.
5	Red Blood Cells	transport oxygen around the body
6	White Blood Cells	fight infection
7	Platelets	clot to prevent blood loss during injury
8	Plasma	liquid part of the blood

## Key Words:

Drive  
Charge  
Key  
Baseline  
Side line

## Skills:

Dribbling  
Jumping  
Passing  
Catching  
Shooting

## Famous basketball players:



Kobe Bryant



LeBron James

## Basketball

## Rules:

**Team players/substitutions** — Each team is allowed 5 players on court at one time. There is no limit on the amount of substitutions you are able to make in each game and each team can have a maximum of 12 players per squad.

**Shot clock** — When a team has possession and the ball is in court, they only have 24 seconds to shoot. If they don't shoot within this time the ball is turned over to the opposition.

**Goaltending** — You are not allowed to stay under the basket. You are only allowed in the 'key' for 3 seconds before having to come out.

**Backcourt Violation** — You are not allowed back into your own half after crossing the midcourt line.

## Basketball Positions and Roles

1. Centre	<ul style="list-style-type: none"> <li>Usually, the tallest and strongest player.</li> <li>They are positioned under the basket to get rebounds and block shots.</li> </ul>
2. Forward	<ul style="list-style-type: none"> <li>Usually, the second tallest and strongest players on the team.</li> <li>Their role is to guard against bigger players on the opposition team.</li> <li>They need to be able to score from all ranges on the court.</li> </ul>
3. Guards	<ul style="list-style-type: none"> <li>Usually, the shortest players on the team.</li> <li>They are the team's best shooters from three-point range.</li> <li>Responsible for driving the ball down the court and setting up teammates.</li> <li>Also known as the 'Coach on the Court' as they dictate what will happen.</li> </ul>

## Principles of Training

1. Specificity	Ensuring that the training is relevant and specific to the sport you are training for
2. Progressive Overload	Training frequency, intensity, time and type must be increased over time to ensure the body is pushed beyond its normal rhythm
3. Individual Needs	Training must be related to an athlete's age, gender, injury status and fitness level
4. Reversibility	Systems and progress are reversed if training stops or is reduced
5. Rest and Recovery	Physical adaptations occur during the recovery and rest periods of the training cycle
6. Overtraining	If an athlete doesn't have sufficient rest periods then their body doesn't have time to adapt and overall fitness declines

## FITT Principle

1. Frequency	This is increased by training a greater number of times each week
2. Intensity	This is increased by lifting a greater resistance when weight training, or training at a higher percentage of your maximum heart rate
3. Time	This can be when you train for longer periods or when you reduce recovery time between sets of exercise
4. Type	This is where you offer a variety of training types and experiences for the athlete by combining different training methods



## Key Words:

Rings

Technique

Release

Momentum

Pacing

## Skills:

Jump

Throw

Sprint

Pace

## World

## Records:

Men's 100m:

9.58 secs

Women's

100m:

10.49 secs

Men's Jave-

lin:

98.48m

Women's

javelin:

72.28m

## Athletics

Sprint Technique

1. Balls of your feet
2. Front Knee Drive
3. Arms pumping – 'hip to lip'
4. Head straight, looking forward.  
Events: 100m, 200m, 300m and 400m

Jump Technique

1. Take off foot behind the front of the board
2. Take off with one foot; land with two feet.
3. Triple Jump (*Hop, Step, Jump*).
4. Run up and swing arms when jumping to gather momentum.

Middle Distance Technique

1. Slightly leaning forward
2. Head position and looking forward
3. Arms swinging back and forward.
4. Front knee lift slightly (not as high as sprinter)
5. Foot – land on balls of feet.
6. Pacing – spreading out your energy across the whole race to have a strong finish with consistency throughout the event.

Throwing technique

1. Shot: Stand sideways on.
2. Clean palm, dirty neck, holding the shot in your fingers
3. Discus: Hold the discus in one hand.
4. Release the object at a 45° angle
5. Low to high release
6. Javelin: Hold in one hand with a choice of three grips to use
7. Twist the hips to gain more power

## The Olympics

1. The Olympics was an ancient tradition and originated in Greece.
2. They were created by a French man called Baron Pierre de Coubertin.
3. The first modern-day Olympics were held in 1896 and was hosted in Greece.
4. Each Games' are held every four years and this allows a country to build ne facilities and show off their country to the world.
5. The 5 Olympic rings represent the major regions in the world (*Europe, Africa, The Americas, Asia and Oceania*).
6. Every national flag of the world has at least one of the 5 colours of the Olympic rings within it: *blue, black, red, yellow and green*.
7. 1936—The Games took place in Germany when Hitler was the leader of the country
8. 1984—The Los Angeles Olympics which a number of countries boycotted as American boycotted the 1980 Summer Olympics in Moscow
9. 2012—The London Olympics and the first event where Paralympic events sold out all of their tickets
10. The Olympics are split into two: Summer Games and Winter Games
11. The Paralympics runs after the Olympic Games and this is for athletes who have experienced a disability
12. The word 'Para' means equal to as the games are equal to the Olympic Games
13. During Paralympic events, athletes are graded depending on their disability so that they

Sprints	Middle distances	Throws	Jumps
100m, 200m, 400m Hurdles	800m 1500m	Javelin Discus Shot Put	Long Jump Triple Jump High Jump

**Key Words**

1	Ascension	Jesus' return to heaven after his resurrection
2	Crucify	To kill a person by nailing them to a large wooden cross
3	Garden of Gethsemane	The garden where Jesus was arrested
4	Las Supper	Jesus' final meal with the disciples, where he predicts Peter's denial and Judas' betrayal
5	Palm Sunday	The day Jesus entered Jerusalem on a donkey
6	Pentecost	The day that the Disciples were filled with the Holy Spirit
7	Prophecy	A prediction that something will happen
8	Reconciliation	Repairing our relationship with God by accepting we have done wrong and asking for forgiveness

**Key Quotes**

1	... he scattered the coins of the money-changers and overturned their tables. To those who sold doves he said, 'Get these out of here! Stop turning my Father's house into a market!' (John 2:15-16)
2	Saul...began to preach in the synagogues that Jesus is the Son of God. All those who heard him were astonished and asked, 'Isn't he the man who caused havoc in Jerusalem among those who call on this name? And hasn't he come here to take them as prisoners to the chief priests?' (Acts 9:19-21)

**Unit 3: Biblical Literacy**  
**New Testament – Jesus in Jerusalem****Key Facts**

1	In the week before this death, Jesus rode into Jerusalem on a donkey and was greeted by crowds who put down palm leaves. Christians remember this on Palm Sunday.
2	The first three Gospel writers say that Jesus caused a disruption in the temple in the week leading up to his death, known as the 'cleansing of the Temple'. John places this story at an earlier point in Jesus' life.
3	According to the first three Gospels, Jesus ate a meal with his disciples the night before he died. He told them to eat bread and drink wine in remembrance of him. He also predicted that he would be betrayed by Judas Iscariot and deserted by the other disciples.
4	Jesus was arrested in the Garden of Gethsemane by the Jewish authorities. The Jewish leaders could not kill Jesus themselves because they were living under Roman rule, so they accused Jesus of treason to Pontius Pilate, who sentenced him to death.
5	Jesus was mocked, tortured and killed by a method of called crucifixion. He dies with a sign above him saying 'King of the Jews'. According to Luke, Jesus promised a criminal on a cross next to him that he would be in paradise with him that day.
6	The Gospel writers have differing claims that after Jesus' death he was resurrected. Christians believe that Jesus' death and resurrection made it possible for sins to be forgiven and be reconciled with God.
7	The growth of the Christian Church after Jesus' death is recorded in the book of Acts. After being filled with the Holy Spirit on the day of Pentecost, the disciples spread the message about Jesus.
8	A Pharisee named Saul/Paul originally persecuted Christians, but he converted to Christianity following a dramatic experience on the road to Damascus. He is credited with writing 13 of the books of the New Testament, although biblical scholars disagree about whether all 13 of them were actually written by him.

**Key Words**

1	Caste	A series of social classes that determine someone's job and status
2	Gurdwara	The Sikh place of worship; it literally means 'doorway to the Guru'
3	Gurmukhi	A language created by the Gurus and used to write the Guru Granth Sahib
4	Guru	A religious teacher or guide who leads a follower from spiritual ignorance (GU, darkness) into spiritual enlightenment (RU, light)
5	Guru Granth Sahib	the Sikh holy book; the name means 'from the Guru's mouth'
6	Khalsa	the community of Sikhs founded by the 10th Guru, Gobind Singh
7	Khanda	the symbol of Sikhism, made up of two double edged swords, one sword in the middle and a circle
8	Sikh	A follower of Sikhism; it comes from the Sanskrit word shishya, which means 'disciple' or 'learner'

**Key Quotes**

1	The Kings are butchers and cruelty is their knife. Their sense of duty has taken wings and flown. (Guru Granth Sahib 145:10)
2	If I had 100,000 tongues, and these were then multiplied twenty times more, with each tongue, I would then repeat, hundreds of thousands of times, the Name of the One, the Lord of the Universe. (Guru Granth Sahib 7:6-7)

**Unit 4 - Sikhism  
History and Belief****Key Facts**

1	There are around 25 million Sikhs in the world today, most of them (19 million) living in India.
2	Sikhism began with a man called Nanak, who received a revelation when he was 30 in which he understood that although there are many different religions there is only one God. God loves all people equally no matter what religion they follow.
3	Nanak made four long journeys over a period of 20 years, spreading word of his revelation. He visited and talked to Buddhists, Muslims and Hindus.
4	The story of the miracle of milk and blood emphasizes one of Guru Nanak's important teachings – that of working hard and honestly.
5	Guru Arjan is famous for building the holiest site in the world for Sikhs, the Harmandir Sahib, and for being the first Sikh martyr after his death at the hands of the Mughals.
6	The Sikh symbol of the Khanda was established by Guru Hargobind, who put on two swords to indicate his spiritual authority (piri) and his worldly authority (miri).
7	The last of the human Gurus was Gobind Singh, who established the Khalsa, a brotherhood of Sikhs established to protect their people from persecution.
8	Before he died, Gobind Singh said that the collection of Sikh holy scriptures, the Guru Granth Sahib, would be the eleventh and final – eternal – Guru. It is a collection of scriptures collected over 150 years that is highly revered by Sikhs, who look to it for guidance and leadership and use it in worship services and special ceremonies.



**Key Words**

1	Atma	The soul.
2	Diwan Hall	The main hall in the a gurdwara, where worship services take place.
3	Gurmukh	Someone who puts God and the teachings of the Gurus at the centre of their life.
4	Karma	The forces that influence people's future rebirth.
5	Maya	The temporary and illusory nature of the world.
6	Mukti	Union with Waheguru; to escape the world of illusion and the cycle of life, death and rebirth.
7	Nishan Sahib	A flag that flies over every gurdwara.
8	Sewa	Selfless service to others.

**Key Quotes**

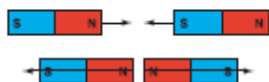
1	[There is] no Hindu nor Muslim, but only man. So whose path shall I follow? I shall follow God's path. God neither Hindu nor Muslim and the path which I follow is God's. (Guru Nanak)
2	When all efforts to restore peace prove useless and no words avail Lawful is the flash of steel. It is right to draw a sword. (Zafarnama (letter written by Guru Gobind Singh regarding Sikh beliefs on war))

**Unit 4 - Sikhism  
In the Modern  
World****Key Facts**

1	Sikhs believe that we are all in a cycle of birth, death and rebirth. We can influence our rebirth by our actions in this life (karma). The ultimate goal is to reach mukti – freedom from this cycle and union with God.
2	The Sikh place of worship is called a gurdwara. An orange flag called a Nishan Sahib always flies above a gurdwara.
3	During Sikh services, the Guru Granth Sahib is placed on a throne in the Diwan Hall; the people all sit on the floor during the service.
4	The langar is a communal place for cooking and eating; every gurdwara must have a langar, which is open to everyone, whatever their gender, ethnicity or religion. In recent years, many non-Sikhs living in poverty have started to visit langars to have a meal each day.
5	Sewa, serving others, is a key Sikh belief. There are 3 forms of sewa; (tan (physical service), man (mental service) and dhan (material service, which includes giving to charity)).
6	Sikhs believe it is acceptable to fight as long as this is a last resort and is in self-defence or in defence of innocent people.
7	Most Sikhs in the UK today are descendants of people who left the Punjab after the partition of India in 1949. However, there were Sikhs in the UK beforehand, and the first gurdwara was built in London in 1911.
8	In recent years there has been controversy over marriages between Sikhs and people of other faiths, with some Sikhs concerned that this may lead to the extinction of the Sikh religion in the long term. Other Sikhs stress the idea of equality that Sikhism embraces and say that Sikhs should be free to marry whomever they love.

### Magnets

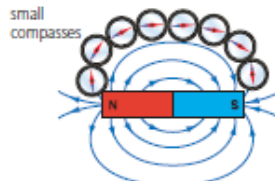
- A **magnet** has two poles, a north and a south pole
  - North poles **attract** south poles
  - South poles **attract** north poles
  - South poles **repel** south poles
  - North poles **repel** north poles



- Magnetic materials** will experience a magnetic force when placed near a magnet, this is a type of non-contact force as the materials do not have to touch for the force to be apparent
- The three magnetic metals are iron, nickel and cobalt

### Magnetic fields

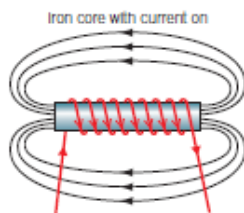
- A **magnetic field** is an area where a magnetic material will experience a force
- A **permanent magnet** will have its own magnetic field
- Magnetic field lines** represent the field, these always travel out of the north pole of the magnet, and into the south pole
- The closer together the magnetic field lines are, the stronger the magnetic field will be
- We can find out the shape of a magnetic field in two ways:
  - Using plotting compasses
  - Using iron filings



- The Earth has its own magnetic field, which acts like a giant bar magnet inside the centre of the Earth
- This magnetic field allows compasses to work when navigating around the Earth

### Electromagnets

- Electromagnets** are made by wrapping a coil of wire around a magnetic **core**
- Electromagnets only work when electricity is flowing through the coil, which means that they can be turned on and off
- Electromagnets are also stronger than **permanent** magnets
- The electromagnet will produce the same magnetic field shape as a bar magnet

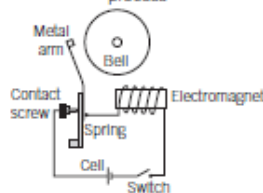


- You can increase the strength of an electromagnet by:
  - Increasing the number of turns on the coil around the core of the electromagnet
  - Increasing the current which is flowing through the coil of wire
  - Using a more magnetic material for the core, e.g. iron rather than aluminium

### Using electromagnets

#### Electric Bells

The electromagnet attracts the iron armature  
 ↓  
 When it moves, it breaks the circuit, no longer allowing current to flow  
 ↓  
 The coil and core are no longer magnetic meaning the spring is no longer attracted and returns to its original position  
 ↓  
 The bell is rung once  
 ↓  
 The circuit is complete again, restarting the process

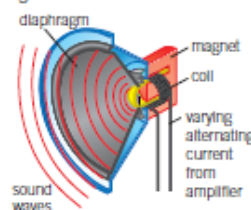


#### Circuit breakers

- Circuit breakers detect large changes in current in a house, and will break a circuit
- When a large current flows, the electromagnet becomes strong enough to attract an iron catch which will break a circuit
- They can then be reset and used again
- This makes them suitable as an electrical safety device in a home

#### Loudspeakers

- Loudspeakers use an electromagnet in order to generate sound
- A current passes through the coil and creates an electromagnet, this repels another permanent magnet which moves the cone in and out creating sound



#### Key terms

Make sure you can write definitions for these key terms.

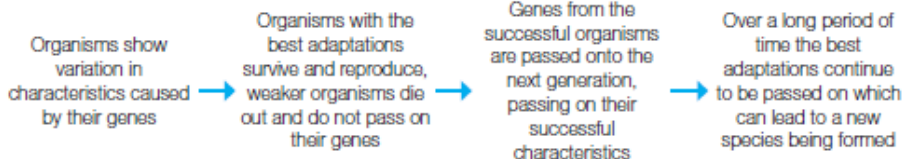
attract   core   circuit breaker   electromagnet   electric bell   loudspeaker   magnet   magnetic pole   magnetic field lines   magnetic material   permanent magnet   repel

Keyword	Definition	Retrieval Question	Retrieval Answer
Attract	Objects moving towards one another due to a magnetic force	Name the 2 poles found on a magnet?	North and South
Core	Soft iron metal which the solenoid is wrapped around	State 2 ways you can find the shape of a magnetic field	Using plotting compasses, using iron filings
Circuit breaker	A device that uses an electromagnet to break a circuit	What happens when you put like poles of a magnet close together?	They repel
Electromagnet	A non-permanent magnet turned on and off by controlling the current through it	What happens when you put unlike poles of a magnet close together?	They attract
Electric bell	A device that uses an electromagnet to make sound using a "make and break circuit"	How do you create an electromagnet?	Make a circular loop of wire and pass a current through it
Loudspeaker	A device that uses an electromagnet. It turns an electrical signal into a pressure wave of sound	What is a solenoid?	A loop of wire made into a coil
Magnet	A material with a magnetic field around it in which a magnetic material experiences a force	What can an electromagnet core be made from?	A magnetic material, usually iron
Magnetic pole	The ends of a magnetic field, called north-seeking and south-seeking poles	Name 3 factors that will change the strength of an electromagnet	Increase the number of turns of wire, increase the current, the material used as a core (magnetic)
Magnetic field lines	Imaginary lines that show the direction of the force on a magnetic material	Give 3 uses of electromagnets	Ringing bell, circuit breaker, loudspeakers
Magnetic material	A material that experiences a magnetic force when placed near a magnet	What is a motor?	
Permanent magnet	A object that is magnetic all of the time	Describe how a motor uses electromagnetism to work	
Repel	Objects moving away from one another due to a magnetic force	What is the difference between a permanent magnet and an electromagnet?	You can turn electromagnets on and off and make them stronger



### Natural selection

- Scientists believe that the organisms which we see on Earth today have gradually developed over millions of years, this is known as **evolution**
- Charles Darwin came up with the concept of **natural selection**, he said that only the best adapted animals will survive to pass on their **genes**, weaker animals will die out



- One example of natural selection can be seen in giraffes, only the giraffes with the longest necks would be able to eat from trees, the ones with shorter necks would not be able to eat and die out
- This would mean that only the gene for long necks would be passed on, leading to all giraffes having long necks

### Extinction

- A species will become **extinct** when all of a species die out
- The **fossil record** shows us that animals have existed in the past which have now become extinct
- Extinction can be caused by:
  - Changes to the environment
  - Destruction of habitat
  - New diseases
  - Introduction of new predators
  - Increased **competition**
- When a species becomes extinct, the variety of species within an ecosystem is reduced, this is also known as a reduction in **biodiversity**
- The more diverse a **population** is, the more likely they are to survive environmental changes

### Punnet squares

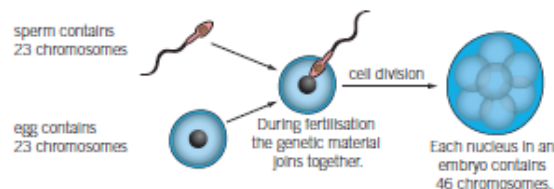
		Possible alleles from father	
		B	b
Possible alleles from mother	b	Bb (dominant allele for brown eyes) Offspring will have brown eyes as B is dominant	bb (recessive allele for blue eyes) Offspring will have blue eyes as both alleles are recessive
	B	Bb (dominant allele for brown eyes) Offspring will have brown eyes as B is dominant	bb (recessive allele for blue eyes) Offspring will have blue eyes as both alleles are recessive

### Genetic modification

- Genetic modification** is the process which scientists can use in order to alter the genes of an organism
- Examples of this include altering cotton to produce higher yields, altering bacteria genes to produce medicines and altering crops to produce their own insecticides

### Inheritance

- Characteristics** are passed along from parents to their offspring
- Half of the genetic information comes from each parent, this is passed on through the sex cells in the process of fertilisation

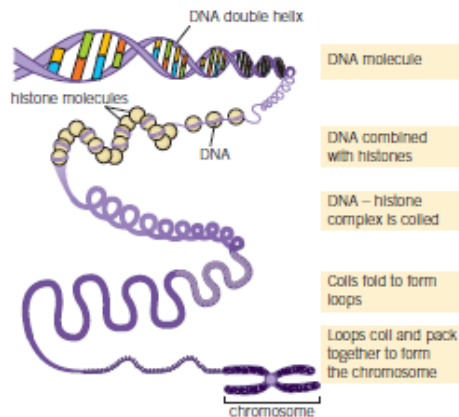


- DNA** is the material which contains all of this genetic information

DNA – in the shape of a double helix

Genes – a section of DNA which hold the information for a particular characteristic

**Chromosomes** – long strands of DNA which hold many genes, humans have 46 of these in the nucleus of cells



### Genetics

- For every characteristic an organism will have two **alleles**, this is two different genes which can code for the same characteristic, one is inherited from each parent
- Dominant** alleles will cause the characteristic to be displayed even if they are with another allele, this is represented by a capital letter
- Recessive** alleles will not be displayed as characteristics unless there are two of the same allele, they are the characteristic least likely to be shown, this is represented by a small letter
- We can predict the inheritance of characteristics using a **Punnet square**



#### Key terms

Make sure you can write definitions for these key terms.

allele biodiversity characteristics chromosome competition DNA dominant evolution extinct fossil record gene genetic modification mutation  
natural selection population punnet square Punnet square recessive

Keyword	Definition	Retrieval Question	Retrieval Answer
Allele	Different forms of a gene	What is evolution?	the development of species on Earth over millions of years
Biodiversity	A measure of the variety of all the different species of organisms on earth or within a particular ecosystem	How do we know some species of organism are now extinct?	fossil records
Characteristics	Features of an organism passes from parents to offspring via genes	What is a fossil?	the remains, or traces, of plants and animals that lived many years ago
Chromosome	Thread-like structure containing tightly coiled DNA. It contains the genes	Why might a plant or animal change over time?	to become better adapted to their environment
Competition	When 2 or more living things struggle against each other to get the same resource	Name the process by which organisms evolve?	natural selection
DNA	A molecule found in the nucleus of cells that contains genetic information	Which organisms did Charles Darwin study on the Galapagos islands?	finches (a type of bird)
Dominant	A dominant allele will always be expressed if it is present	What is meant by "peer review"?	where a scientist's work is checked by another scientist who works in a similar area of science
Evolution	Theory that animals and plant species descended from species in the past	Which other scientist "peer reviewed" Darwins work?	Alfred Wallace
Extinct	When no more individuals of a species remain anywhere in the world	Define the term "extinct"	when there are no more individuals of a species left in the world
Fossil record	Fossils of a species that show how a species has changed over time	Give 3 reasons why a species may become extinct	changes to the environment, destruction of habitat, outbreak of a new disease, introduction of new predators, competition for resources (any sensible answers)
Gene	A section of DNA that determines an inherited characteristic	Define the term "endangered"	a species that is at risk of becoming extinct
Genetic modification	A technique in which scientists insert foreign genes into organisms to change their characteristics	Define the term "biodiversity"	a measure of the variety of all the different species of organisms on Earth
Mutation	A change to the DNA that can cause disease	What is the purpose of a gene bank?	to store genetic samples from different species to use for research or produce new individuals
Natural selection	Process of organisms most suited to the environment survive and reproduce	Define the term "conservation"	protecting a natural environment, to ensure that habitats are not lost

Keyword	Definition	Retrieval Question	Retrieval Answer
Population	Group of organisms of the same kind living in the same place	Give an advantage and a disadvantage of captive breeding programmes	Adv: create stable, healthy populations of a species, re-introduce the species back into its habitat. Dis: difficult to maintain genetic diversity, small numbers of breeding partners, organisms may not be suitable for release in the wild
Punnett square	A diagram used to show possible allele combinations inherited from the parents	State 2 ways biodiversity benefits humans	rich varied food supply, useful products e.g. medicines from plants (any sensible answers)
Recessive	A recessive allele will only be expressed if 2 alleles are present	What is the purpose of DNA?	Genetic material needed to make an organism
Retrieval Question	Retrieval Answer	Retrieval Question	Retrieval Answer
Define the term "peer review"	where a scientist's work is checked by another scientist who works in a similar area of science	Where can DNA be found in the cell?	inside the nucleus (arranged in strands called chromosomes)
Name 2 of the scientists involved in the discovery of the DNA molecule	Erwin Chargaff, Maurice Wilkins, Rosalind Franklin, James Watson, Francis Crick	Describe the structure of DNA	double-helix (twisted ladder)
Which are the only individuals who will have identical DNA?	twins	What is the section of a DNA molecule called?	Gene
Define the term "allele"	different forms of the same gene	What is a mutation?	a change in the DNA
Describe the differences between dominant and recessive alleles	dominant alleles always produce the characteristic in an organism (you only need one copy), recessive alleles require two copies for the characteristic to be expressed in the organism	What is the result of a mutation?	it affects the organisms characteristics
What do you use to produce a genetic cross?	Punnett square	Describe 3 features of a DNA molecule	two strands, twisted in a double-helix shape, joined by 4 chemicals called bases (Adenine, Thymine, Cytosine and Guanine)
What is the probability of a mother and father having a baby boy?	50%	State an advantage of genetic modification	quick, precise
Define the term "genetic modification"	altering an organisms genes	Name 2 useful chemicals produced by genetically modified bacteria	vacines and antibiotics



### Elements and atoms

- An **element** is a substance that only contains one type of atom, it is found on the **Periodic Table**
- Each element has its own unique chemical symbol which is the same in every language, these are also found on the Periodic Table
- An **atom** is the smallest part of which an element can be broken down into
- As there are around 100 types of elements that can occur naturally, there are around 100 different atoms

### Compounds

- Compounds** are formed when two or more different elements chemically bond together
- The compound will have different **physical properties** to the elements which make up the compound, for example water is a liquid, but it made from oxygen and hydrogen which are both gases
- Compounds are hard to separate and need a chemical reaction to do this

- When naming a compound, we always mention the metal first and the non metal second
- The name of the metal will not change but the name of the non metal will, for example oxygen can change to oxide
- Chemical formulae tells us how many atoms of each element are in the compound in relation to each other



- The small number tells us the number of each element which is in front of the number

### Polymers

- Polymers** are long chains of groups of atoms which are repeated many times
- Natural polymers are not man-made and include wool, cotton, starch and rubber
- Synthetic polymers are man-made and include polythene, polystyrene and nylon

### Groups and periods

- Groups** are the columns in the Periodic Table, they go downwards
- Periods** are the rows in the Periodic Table, they go sideways
- Elements in the same group normally follow the same trends in properties such as melting point, boiling point and reactivity
- By placing these elements into these groups, scientists can make predictions about their properties

1		2																		group number						0
Li		Be																								He
Na		Mg																								Ne
K		Ca		Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr							
Rb		Sr		Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe							
Cs		Ba		La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn							
Fr		Ra																								

### Group 0

- Group 0** elements are known as the **noble gases**
- They are all non metals with low melting and boiling points, meaning all are gases at room temperature
- The boiling point decreases going down the group
- All of the group 0 elements are unreactive
- When electricity is passed through the gas, they emit a brightly coloured light, this can be seen in neon signs

### Halogens

fluorine	↑ most reactive
chlorine	
bromine	
iodine	
	↓ least reactive

### Group 1

- Group 1** elements are also known as the **alkali metals**
- They share similar properties with other metals such as:
  - Being shiny when freshly cut
  - Being good conductors of electricity and heat
- Group 1 metals are much softer than other metals and also have much lower melting and boiling points
- Group 1 elements react with water to form alkali solutions
 

lithium + water → lithium hydroxide + hydrogen

metal + water → metal hydroxide + hydrogen
- The further down the group that the metal is, the more vigorous the reaction will be. This is called a **trend**
- Another trend seen in Group 1 is with the boiling and melting points: the further down the group, the lower the boiling and melting points are

### Group 7

- Group 7** elements are also known as the **halogens**
- They share similar properties with other non metals such as:
  - Having low melting and boiling points
  - Not conducting electricity
  - Moving down the groups the elements have an increased melting and boiling point
- The halogens also react in a similar way to one another, for example with iron:
 

iron + chlorine → iron chloride

iron + bromine → iron bromide
- Halogens can undergo **displacement reactions**, this is where a more reactive halogen will take the place of a less reactive halogen
- The most reactive halogens are at the top of the group, and the least reactive halogens are at the bottom of the group
- If the most reactive halogen is on its own, it will take the place of the less reactive halogen in a compound
 

calcium bromide + chlorine → calcium chloride + bromine



#### Key terms

Make sure you can write definitions for these key terms.

atom   alkali metals   compound   displacement reaction   element   group   Group 1   Group 7   Group 0   halogen  
 noble gas   period   Periodic Table   physical properties   polymer   trend

Keyword	Definition	Retrieval Question	Retrieval Answer
Atom	The smallest part of an element that can exist	Define the term "element"	substances that contain only 1 type of atom
Alkali metals	The elements in the left column of the periodic table including lithium, sodium etc. also called group 1	What is the Periodic Table?	a table containing all the symbols and names of different elements
Compound	Pure substances made up of atoms of 2 or more elements strongly joined together	What is the chemical symbol for Hydrogen?	H
Displacement reaction	A reaction involving a metal and a compound of a less or more reactive metal	Which element has the chemical symbol Cu?	Copper
Element	Substances which contain only one type of atom	What is the chemical symbol for Chlorine?	Cl
group	A column in the periodic table. The elements have similar properties	Define the term "compound"	A pure substance made up of atoms of two or more elements joined together
Group 1	The elements in the left column of the periodic table, including sodium and lithium. Also known as the alkali metals	Name 2 compounds	water, carbon dioxide (any sensible answer)
Group 7	Elements in the right column of the periodic table including fluorine and chlorine. Also known as the halogens	How can compounds be made?	reacting two or more elements together
Group 0	Elements in the farthest right column of the periodic table including helium and neon, also known as the noble gases	What are the elements in Nitrogen Dioxide?	Nitrogen and Oxygen
Halogen	An element in group 7 of the periodic table	What are the elements present in Hydrochloric Acid?	Hydrogen and Chlorine
Noble gas	An element in group 0 of the periodic table	What are the elements found in Calcium Carbonate?	Calcium, Carbon and Oxygen
Period	A row in the periodic table	How many atoms are in a molecule of Carbon Dioxide CO <sub>2</sub> ?	1 Carbon, 2 Oxygen
Periodic table	A table which shows all known elements. Elements with similar properties are grouped together	How many atoms are in a molecule of Sulfuric Acid H <sub>2</sub> SO <sub>4</sub> ?	2 Hydrogen, 1 Sulfur, 4 Oxygen
Physical properties	Features of a substance that can be observed without changing the substance itself	What is a polymer?	a substance with very long molecules
Polymer	A molecule made by joining up thousands of smaller molecules in a repeating pattern.	What are the 2 different types of polymer?	natural and synthetic

Keyword	Definition	Retrieval Question	Retrieval Answer
Trend	A pattern in properties, such as an increase or decrease	Give an example of each type of polymer and suggest a use	natural - wool and cotton, used in clothing, rubber - tyres. Synthetic - poly(ethene), used in carrier bags, artificial joints
		What is the Periodic Table?	a table containing all the symbols and names of different elements
		What are the horizontal rows called?	periods
		What are the vertical columns called?	groups
		Give 3 physical properties of elements?	melting point, boiling point, density, hardness, state
		Name all the elements in Group 1 of the Periodic Table	lithium, sodium, potassium, rubidium, copper, platinum
		Are the elements in Group 1 metals or non-metals?	metals
		How does the reactivity of the elements in Group 1 change?	increases down the group
		What is another name for the Group 1 metals?	alkali metals
		How does the trend in boiling point change in Group 1?	decreases down the group



## Chemical reactions

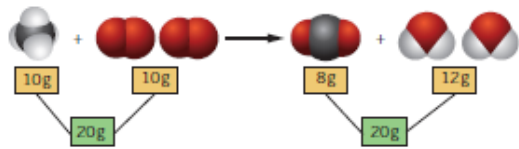
- Word equations can represent a **chemical reaction**:



- The **reactants** are on the left side of the arrow and the **products** are on the right side of the arrow
- We use an arrow instead of an equals sign as it represents that the reactants are changing into a new substance
- In a reaction, the amount of each type of atom stays the same, however they are rearranged to form a new product

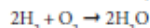
## Conservation of mass

- In a reaction the mass will be **conserved**, this means that the total mass of the reactants will be equal to the total mass of the products
- If it appears that some of the mass has been lost, this means that a gas has been produced and escaped, accounting for the lost mass



**Balanced symbol equations** show the amounts of all of the individual atoms in a reaction

- The symbols used are from the Periodic Table
- They also show:
  - Formulae of reactants and products
  - How the atoms are rearranged
  - Relative amounts of reactants and products



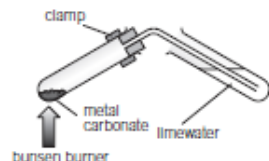
## Combustion

- Combustion** is the burning of a **fuel** in oxygen
  - A fuel is a substance which stores energy in a chemical store
  - Examples of fuels include petrol, diesel, coal and hydrogen
  - When a carbon based fuel undergoes combustion, it will produce water and carbon dioxide
- $$\text{methane} + \text{oxygen} \rightarrow \text{carbon dioxide} + \text{water}$$

- Hydrogen can also be used as a fuel, this is much better than traditional fossil fuels as it does not produce carbon dioxide:
- $$\text{hydrogen} + \text{oxygen} \rightarrow \text{water}$$

## Thermal decomposition

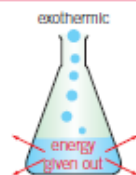
- A **thermal decomposition** reaction is one where the reactants are broken down (decomposition) using heat (thermal energy)
- An example of this is with metal carbonates:  
zinc carbonate → zinc oxide + carbon dioxide
- We can test for this carbon dioxide by bubbling the gas through limewater, if the limewater turns cloudy, the gas is carbon dioxide



## Exothermic and endothermic reactions

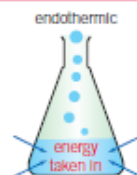
**Exothermic** reactions involve a transfer of energy from the reactants to the surroundings

- As energy is transferred to the surroundings this will show an increase in temperature
- Examples of exothermic reactions include combustion, freezing, and condensing



**Endothermic** reactions involve a transfer of energy from the surroundings to the reactants

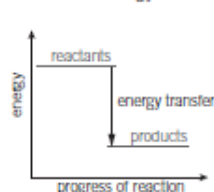
- As energy is taken into the reactants a decrease in temperature will be shown
- Examples of endothermic reactions include thermal decomposition, melting, and boiling



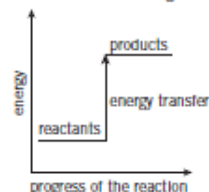
## Energy level diagrams

**Energy level diagrams** show the values of energy between the reactants and the products in a reaction

- If the energy is greater in the reactants than the products then the reaction is exothermic as energy has been given out to the surroundings
- If the energy is lower in the reactants than the products then the reaction is endothermic as energy has been taken in from the surroundings



Exothermic



Endothermic

## Bond energies

- Energy must be used to break **chemical bonds**, meaning that this reaction is endothermic
- Energy is given out when chemical bonds are made, meaning that this reaction is exothermic
- To see if a reaction is endothermic or exothermic, you must find the difference in the energy needed to break and to make the bonds in the reaction
- If the energy needed to break the bonds is less than the energy given out when making the bonds, the reaction is exothermic
- If the energy needed to break the bonds is more than the energy released when making the bonds, the reaction is endothermic



## Key terms

Make sure you can write definitions for these key terms.

balanced symbol equation

chemical bond

chemical reaction

combustion

conserved

conservation of mass

decomposition

fuel

endothermic

energy level diagram

exothermic

products

reactants

thermal decomposition

Keyword	Definition	Retrieval Question	Retrieval Answer
Balanced symbol equation	Show the amounts of all the individual atoms in a reaction	What is a chemical reaction?	When atoms rearrange and form new products
Chemical bond	the force that holds atoms together in molecules	What is meant by the conservation of atoms?	The number of atoms at each element before and after the reaction is the same
Chemical reaction	A change in which a new substance is formed	Draw a particle diagram showing the arrangement in a solid	Diagram showing particles joined together in a regular order
Combustion	A chemical reaction in which a substance reacts with oxygen and gives out heat and light	Draw a diagram showing what happens to particles when copper and oxygen produce copper oxide	Diagram showing 1 atom of copper (Cu) and 1 molecule of oxygen (O <sub>2</sub> ) forming a molecule of copper oxide (CuO)
Conserved	When the quantity of something does not change	What are the substances added in a reaction called?	Reactants
Conservation of mass	The total mass of the reactants is equal to the total mass of the products	What happens in a combustion reaction?	A substance reacts with oxygen to form carbon dioxide and water
Decomposition	A chemical reaction in which a compound breaks down	What is a fuel?	A substance that stores energy in a chemical store
Fuel	A substance that stores energy in a chemical store	Give an example of a finite / non-renewable fuel	Petrol, diesel, coal, methane
Endothermic	A reaction that takes in energy, usually heat from the surroundings	Give an example of a renewable fuel	Cooking oil, animal waste, hydrogen
Energy level diagram	A diagram showing whether a reaction is endothermic or exothermic	Write the word equation for combustion	Fuel + oxygen → carbon dioxide + water
Exothermic	A reaction that gives out energy into the surroundings	What does a carbonate consist of?	Carbon and oxygen
Products	Substances formed in a reaction	Define the term "decomposition"	A single compound breaks down into simpler compounds or elements
Reactants	Substances that react together	Define the term "thermal decomposition"	A single substance breaks down on heating to make more than one product
Thermal decomposition	A chemical reaction in which a compound breaks down when heated	How do we test for carbon dioxide gas?	Use limewater which turns cloudy
		Name the products of the thermal decomposition of calcium carbonate	Calcium and carbon dioxide
		What is meant by the conservation of mass in reactions?	The total mass of reactants is equal to the total mass of products

Retrieval Question	Retrieval Answer	Retrieval Question	Retrieval Answer
Draw an energy level diagram for an endothermic reaction	Diagram showing products higher than the reactants	What does a balanced symbol equation show?	The formulae of reactants and products, how the atoms are rearranged, the relative amounts of reactants and products
Is ice melting an exothermic or endothermic process?	Endothermic	Write the word equation for the burning of carbon	Carbon + Oxygen $\rightarrow$ Carbon dioxide
Do the reactants or the products have more energy in an exothermic reaction?	Reactant have more energy than the products	Write the balanced symbol equation for the burning of carbon	$C + O_2 \rightarrow CO_2$
What is the unit of measurement for energy?	Joules (J) or kilojoules (kJ)	What is an endothermic reaction?	A reaction where energy is transferred from the surroundings to the substances that are reacting
What is the unit of measurement for mass?	grams (g) or kilograms (kg)	What is an exothermic reaction?	A reaction where energy is transferred to the surroundings from the substances that are reacting
Is bond breaking endothermic or exothermic?	Endothermic	What piece of scientific apparatus measures temperature?	Thermometer
Is bond making endothermic or exothermic?	Exothermic	How do we calculate change in temperature?	Temperature after - temperature before
What is a catalyst?	A substance that speeds up a chemical reaction but remains unchanged	Draw an energy level diagram for an exothermic reaction	Diagram showing products lower than the reactants
What is a chemical bond?	A strong force that holds atoms together		











## 1. Key Vocabulary & Definition

<b>Motion</b>	This is the action of a process or something being moved
<b>Levers</b>	A ridge or bar resting on a pivot
<b>Mechanisms</b>	Systems of parts working together in a machine
<b>Mechanical advantage</b>	the ratio of the force produced by a machine to the force applied to it, used in assessing the performance of a machine. $MA = \frac{\text{Load}}{\text{Effort}}$
<b>Effort</b>	the amount of force applied by the user, also referred to as the input.
<b>Product Analysis</b>	primary research and involves looking at existing products, working out how they were made and seeing what features might be useful to any possible new design. Product analysis can often be referred to as ACCESS FM.
<b>Vacuum Former</b>	Use to heat a single sheet of polymers to a temperature which allows the plastic to stretched and formed over a mould.
<b>Polymers</b>	Polymers are materials made of long, repeating chains of molecules.
<b>Electric current</b>	A flow of electrons
<b>Circuit</b>	An unbroken loop that allows the electrons to flow
<b>Conductor</b>	A material that allows electrons to flow freely e.g. a copper wire
<b>Insulator</b>	A material that doesn't allow electrons to flow through them e.g. the plastic sleeving on a cable
<b>System</b>	A system is a set of devices or things which are connected and work in conjunction with each other in order to perform a specific function.

**Key topics:** Motion and Mechanisms, Product Analysis – ACCESSFM, Vacuum Forming and Polymers, Electronic components, soldering and Health and Safety

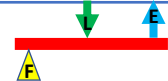
## 2. Motions and Mechanisms

	Reciprocating motion is a repetitive back and forth or up and down movement. E.g. a sewing machine needle 		Linear motion is when an object moves in a straight line. E.g. Usain Bolt running 100 metres 
	Rotary motion is when an object moves around a fixed point or axis. E.g. handles of a clock or a spinning top 		Oscillating motion is when an object moves to and fro from a pivot or fixed point. E.g. a swing or pendulum 

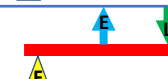
**Class 1 Lever** have the **Fulcrum** between the **Force** and the **Load**.  
E.g. pliers, scissors, a crowbar, a claw hammer, a see-saw



**Class 2 Lever** have the **Load** between the **Force** and the **Fulcrum**.  
E.g. stapler, nut-cracker, wheel-barrow and nail clipper



**Class 3 Lever** have the **Force** between the **Load** and the **Fulcrum**.  
E.g. Fishing rod, arm, and broom



## Soldering Health and Safety

- Soldering irons and holders get very hot.
- Be careful not to burn yourself.
- If you burn yourself then walk to the sink and run your it under the cold tap.
- Always place your soldering iron in the holder when you are not using it.
- Only one person should be soldering at a time.
- Always wear goggles and an apron.
- Soldering creates gases which you should try to not breath in.
- Sit on a stool whilst soldering.
- Never touch the soldering iron to see if it is on.



Vacuum forming

Put the former in the vacuum forming machine and clamp the plastic into position.

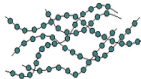
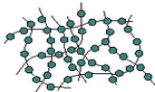
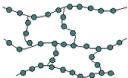
Heat the plastic until it softens to a 'rubber like' state.

Remove the heat and raise the former into the softened plastic.

Turn on the vacuum. The plastic will be drawn around the shape of the former.

When cooled, unclamp the plastic and remove the former. Trim to the required size and shape

4

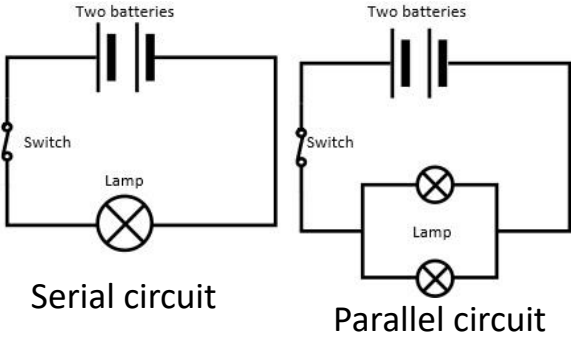
Polymers	Uses	
Acrylic (PMMA)	is a transparent thermoplastic used as a lightweight, shatter-resistant alternative to glass. Acrylic comes in different colours is typically used in sheet form create various products such as acrylic mirrors and other artifacts.	
High Impact Polystyrene (HIPs)	Thermoplastic used for display and signage. It comes in lots of colours, has good electrical conductivity, impact-resistant material, which makes it easy to vacuum form, extrude, bend and mould into shape. It is environmentally friendly, as it can be recycled.	
Thermo	Thermosetting	Elastomers
		

5

6. Electronic Components and Systems

INPUT	PROCESS	OUTPUT
Input devices receive an external signal that triggers the start of the system.	This is what happens to the input to change it to an output. Process devices make all the decisions.	This is the result of the system.

Component	Purpose	System
	Cell	Source of current electricity
	open switch (off)	Stops the flow of current
	lamp	Converts electrical energy into light
	closed switch (on)	Allows the flow of current
	LED (light emitting diode)	A semiconductor light source that emits light when current flows through it.
	resistor	Controls the flow of electricity in the circuit
	battery	Two or more cells joined together
	LDR (light dependent resistor)	A photo-conductive cell that decreases resistance. It depends on the light falling on its surface.



## Key Words

1

1	<b>Anthropometrics</b>	The <b>study of the human body</b> and its movement, often involving <b>research into measurements</b> relating to people. It also involves collecting statistics or measurements relevant to the human body, called <b>Anthropometric Data</b> .
2	<b>Ergonomics</b>	Ergonomics are models of people in normal proportions.
3	<b>Ergonomics</b>	Defined as the science of fitting a workplace to the user's needs, <i>ergonomics</i> aims to increase efficiency and productivity and reduce discomfort
4	<b>Product Analysis</b>	Examining product features, costs, availability, quality, appearance and other aspects. We can use the acronym ACCESS FM to help us remember the key features of a product Analysis
5	<b>Triangulation</b>	Triangulation involves the use of triangular shapes to give stability to structures
6	<b>Biomimicry</b>	a practice that learns from and mimics the strategies found in nature to solve human design challenges
7	<b>Crating</b>	Using sketched 3D cubes/ cuboids to help structure more complex drawings
8	<b>Attachment Techniques</b>	Ways to join pieces of material together. In the case of this project it refers to modelling materials

## Scaling:

2

Scaling is a drawing method used to enlarge or reduce a drawing in size while keeping the proportions of the drawing the same. Scales are generally expressed as ratios.


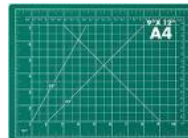






1:1	Full size		
1:2	Half of the original size	2:1	Twice the original size
1:5	A fifth of the original size	5:1	Five times larger than the original size
1:10	A tenth of the original size	10:1	Ten times larger than the original size
1:20	A twenty-fifth of the original size	25:1	Twenty five times larger than the original size

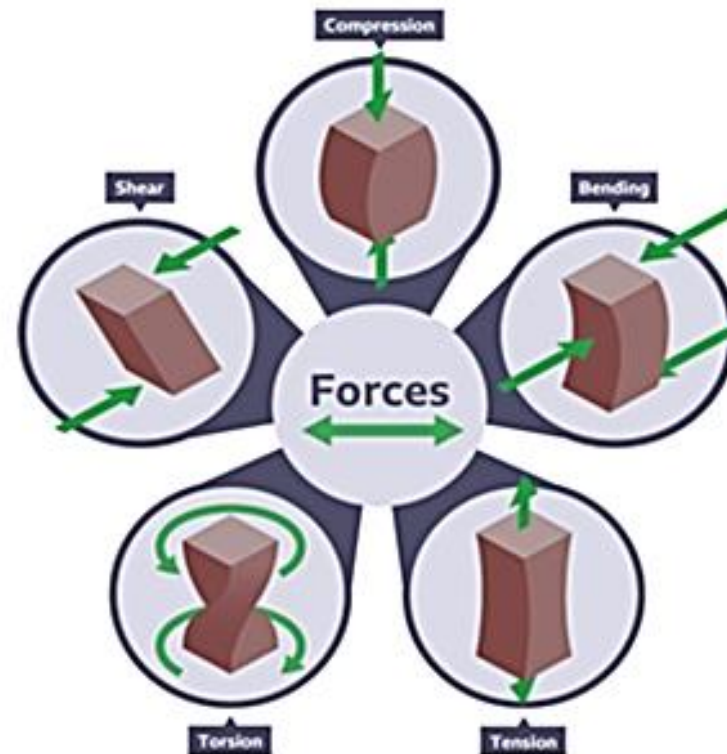
3

<b>A</b>	Aesthetics	Appearance: colour, shape, texture, design style
<b>C</b>	Cost	How much does the product cost? How much would it cost to manufacture?
<b>C</b>	Customer	Who is it aimed at? Will this person be buying the product for themselves?
<b>E</b>	Environment	Environmental impact of the product. From manufacture, use and disposal
<b>S</b>	Safety	H&S considerations of a product during use and manufacture
<b>S</b>	Size	Dimensions of a product. Consider ergonomic aspects to the design
<b>F</b>	Function	What is its job?
<b>M</b>	Manufacture/ Materials	How is it made? What is it made from?



## Tools, equipment and joining methods

1	<b>Craft Knife</b>	craft knife is a single bladed knife that easily cuts through a variety of different materials. The craft knives we use in school have a plastic handle and a retractable blade.	
2	<b>Cutting Board</b>	self healing cutting mats are purpose-built to be extremely durable and resilient, creating the perfect cutting surface that reduces blunting but also ensures any worksurface is well protected from damage . They often have lines printed on them to help you when cutting straight lines	
3	<b>Metal Rule</b>	Metal safety Rule's features a unique M profile which allows you <b>to keep your fingers well away from any knife edge</b> when used for cutting or scoring. They are made from metal to prevent the rule being damaged by the blade of a craft knife	
4	<b>Glue Gun</b>	Heats up glue sticks to change the glue into liquid form. Good for gluing paper and boards quickly	
5	<b>Tab</b>	An extra rectangle added to a piece of card/ paper. Tabs are folded over, glued and used to add support when joining two piece s of material together	
6	<b>Flange</b>	A number of tabs cut around the base of a tube. These are flattened down to give more surface area to glue the tube to a surface	
7	<b>Gusset</b>	Triangular shaped support that add strength when joining two piece of material at a 90 degree angle	
8	<b>Split Pin</b>	A metal pin that has two legs that can be spilt when joining two pieces of card of paper. It allows for rotational movement when modelling	



## Modelling Materials

1	Styrofoam
2	Foam Board
3	Corrugated Cardboard
4	Balsa Wood
5	Plasticine
6	Art Straws

## CAD / CAM terms

1	CAD = Computer Aided Design
2	CAM = Computer Aided Manufacture
3	Google Sketchup = 3D CAD package
4	2D Design = CAD package we use with the laser cutter
5	CNC Machine = Computer Numerical Control Machine

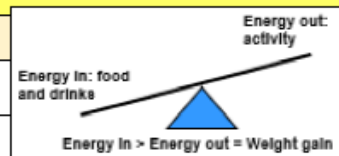
**Key topics:** Nutritional needs of others, health issues associated with a poor diet, religious diets and food choices, food origins, organic and intensive farming, food miles and seasonality.

## Eatwell Guide









Age	Definition
Young children	Diet should be based on the Eatwell guide. Children have small stomachs and should have small meals more frequently. Dairy is important for calcium. They should be encouraged to try new foods.
Children	They are very active and growing rapidly. Need a balanced diet, sugar and snacking should be avoided.
Teenagers	Growth is in spurts, protein required for muscles and calcium for skeleton. Teenage girls begin menstruation (blood loss – loss of iron). Teenagers deal with stress and this can lead to poor eating habits.
Adults	Stop growing so needs don't vary much. Eatwell guide should be followed. Metabolic rate slows through age. Muscle is lost and fat gained.
Elderly	Usually less active and need less energy. Taste and smell can change which affects enjoyment. Calcium, vitamin D and B12 are important.

Health Problem	Definition
Malnutrition	Having intakes of energy and/or nutrients below or in excess of needs for long periods of time can affect health.
Over nutrition	The most common over nutrition problem is <b>obesity</b> caused by too much energy being consumed, or high levels of inactivity.
CHD & High Cholesterol	<b>Coronary heart disease (CHD)</b> is caused by a narrowing of the blood vessels to the heart. This reduces the flow of blood to the heart. <b>High levels of cholesterol</b> in blood increase the risk of CHD.
Type 2 Diabetes	Diet plays a strong role in preventing type 2 diabetes, a condition that causes the level of sugar (glucose) in the blood to become too high.
Anaemia	A condition caused by insufficient <b>iron</b> in the body. Common symptoms include tiredness and lethargy.
Bone Health	Calcium is important for strong bones. Vitamin D is needed for calcium to be absorbed from food.
Cancer	There are some foods that are directly linked to cancer, but our overall diet is more important than these individually and a healthy balanced diet can reduce the risk of some types of cancer.



### 3 Food choice and religious diets

							MORE INFO
BUDDHISM	Preferable to be vegetarian and refrain from meat					✓	Many people will not eat meat or fish, and monks have additional restrictions.
HINDUISM	✗	✗	✗	✗	✓	✗	Vegetarian diet, while fasting is observed on certain days and certain foods are forbidden.
ISLAM	*HALAL	✗	*HALAL	✓	✓	✗	Anything with pork and lard is forbidden, and Halal foods are allowed.
JUDAISM	*KOSHER NOT WITH DAIRY	✗	*KOSHER NOT WITH DAIRY	NO SHELLFISH	NOT WITH MEAT	✓	Certain foods are restricted during Passover such as leavened products i.e. bread. Eating and drinking during fast days are prohibited.
CHRISTIANITY / ROMAN CATHOLICISM	✓	✓	✓	✓	✓	✓	Meat is restricted on Fridays of Lent, Ash Wednesday, and Good Friday (fish is permitted). Fasting is practiced.
SIKHISM	*Halal and *Kosher in some sects					✓	Lacto-vegetarian diet in temples, while not forbidden from meats (individual choice).

### 5 Where our food comes from



This symbol means that the products have come from farmed animals that have been inspected to **VERY high welfare standards** – providing them with physically and mentally stimulating environments from birth to slaughter.



This symbol means that the food you buy has been **responsibly sourced** from **British farmers**, safely produced and comes from crops and animals that have been well cared for












This logo is stamped on to egg to certify that they are **British** and that the **hens have been vaccinated** against Salmonella.



This symbol means that the product is certified to **high organic standards** and provides an assurance of organic authenticity.

### 7 Key Terms

6	Intensive Farming	Organic Farming
Quantity (yield) 	High yield, large amounts of food produced.	Lower yield of crops and more is lost and less is grown.
Pesticides 	Keep pests away resulting in more crop.	Pesticides restricted, natural predators encouraged
Animals 	Battery rearing of animals in enclosures, less humane and can cause disease to spread quickly through the animal population..	Animals have a better quality of life with access to outdoors. Animals not given antibiotics.
Labour 	Artificial chemicals and machines means fewer people are needed for work	More people are needed to work the farms.
Fertilisers 	If too much is used, it can wash in to streams and lead to pollution.	Only natural fertilisers are used along with crop rotations.
Cost 	Low cost of production but a high initial set up, maximum output is achieved resulting in a lower cost for consumers	Production is lower and more space is needed, resulting in higher cost produce for consumers.

Key terms	Definition
Health Balanced Diet	A balanced diet is based on the Eatwell Guide. An unbalanced diet can lead to dietary related diseases.
Dietary law	In many religions and cultures texts and teachings, include rules and advice, state which foods should or shouldn't be eaten.
Halal 	refers to foods that are allowed to be eaten according to Islamic law, and how and animal is slaughtered.
Kosher 	Is a word used to describe food and drink that complies with Jewish religious dietary law, and refers to how and animal is slaughtered.
Organic 	Food produced without the use of chemical fertilisers, pesticides or other artificial chemicals.
Intensive farming	A way of producing large amounts of crops, by using chemicals and machines as well as keeping animals indoors to restrict movement.
Seasonal	The times of the year when the harvest or the flavour of a food is at its peak.
Food miles	The distance food is transported from the time of its making, until it reaches the consumer.

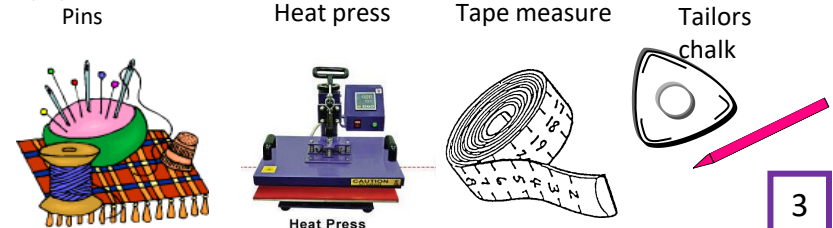


## Year 8 F&F – Fabric and Fibres

Key word	Definition	
<b>Fabric</b>	Textile fabrics are woven or knitted from <b>yarn</b> , which is made from <b>fibres</b> : <span style="float: right; border: 1px solid purple; padding: 2px 5px;">1</span>	
<b>Natural Fibre</b>	Natural fibres are from <b>plants</b> and <b>animals</b>	They are renewable, sustainable and biodegradable.
<b>Synthetic Fibre</b>	Man-made fibres/ manufactured from fossil fuels (coal, oil and gas).	Cannot be replaced, do not decompose and contribute to environmental problems if they end up in landfills.
<b>Regenerated Fibre</b>	a mixture of manmade and natural	E.g. Polyester cotton is used to make shirts. It improves the properties of the material.
<b>Bonded</b>	A nonwoven fabric in which the fibres are held together by a bonding material.	
<b>Smart Textiles</b>	Fabrics that can sense and react to environmental stimuli, which may be mechanical, thermal, chemical, biological, and magnetic amongst others.	
<b>Sublimation Printing</b>	A method of <b>printing</b> that transfers a design into a material or fabric using ink and heat.	
<b>Fabric Embellishment</b>	This is a method of adding surface decoration to fabric or garments. E.g. quilting, embroidery applique, patchwork, piping, beads and trims.	
<b>Tessellation</b>	Is an arrangement of shapes closely fitted together in a repeated pattern without gaps or overlapping. Triangles squares and hexagons are three polygons that tessellate.	
<b>Cutting list</b>	A cutting list, is as a material list, that simply lists all the parts that will be required to construct a project.	
<b>Seam allowance</b>	This is the area that is allowed for stitching, between the fabric edge and the stitching line on two pieces of material being sewn together.	

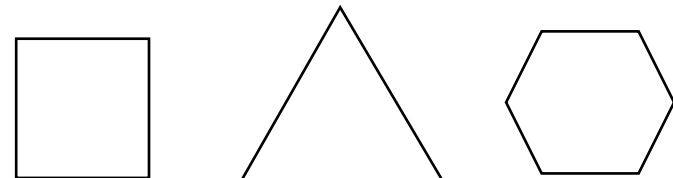
Fibre	Source	Used for
<b>Polyester</b>	is a synthetic fibre that comes from crude oil. When made into fabric, it tends to feel slippery and silky. Some polyester is blended with other fabrics to provide more stretch, or to reduce skin irritation.	Polyester is used to make shirts, jackets and furnishings. School blazer <span style="float: right; border: 1px solid purple; padding: 2px 5px;">2</span>
<b>Polyester wadding</b>	Is made up fibres that are punched through a very fine scrim (netting), normally of polypropylene where it gets tangled up.	A bonded fabric used to quilt or form padding between two layers of fabric. It is soft and fluffy to touch.
<b>Elastane/ Spandex</b>	an elastic polyurethane material, Often mixed with cotton or polyester.	used for hosiery, underwear, and other close- fitting clothing such as leggings.

### Equipment


3








### Tessellation

A regular tessellation is made up of regular polygons. Only **three** regular polygons tessellate: triangles, squares, and hexagons.


5

## Year 8 F&amp;F – Fabric and Fibres

4

Fabric Embellishment		Smart textiles	
<b>Quilting</b> 	<b>Applique</b> 	<b>Thermochromic pigment</b> 	<b>Shape memory alloy</b> 
<b>Beading</b> 	<b>Piping</b> 	<b>Photochromic pigment</b> 	<b>Vilene and Bondaweb</b> are bonded fabric that stop the fabric from fraying and are used to stabilise the fabric - stopping it from stretching. They are smart textiles because they react with heat.

## Adding colour

## Dyeing techniques

- Fabric dyeing involves soaking fabric in a dye bath so that it absorbs the colour into the fibre. **Methods of dyeing include;** Tie dyeing, Batik, Dip Dye and Space dye.

## Printing Techniques

- A Printing technique is a **process** of applying colour to fabric in definite patterns or designs.

## Block Printing

- A technique for printing text, images or patterns using a block

## Screen Printing

- A printing technique where a mesh is used to transfer ink onto a substrate, except in areas made impermeable to the ink by a blocking

## Sublimation Printing

- A method of **printing** that transfers a design into a material or fabric using ink and heat.

6

## Embroidery Stitches

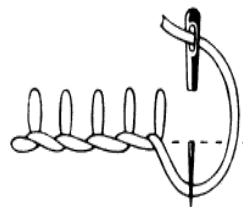
Chain Stitch

Bring the thread up at the top of the line and hold it down with the left thumb. Insert the needle where it last emerged and bring the point out a short distance away. Pull the thread through, keeping the working thread under the needle point.

Blanket Stitch

To make a blanket stitch, bring the needle and thread up through the first hole then down through the next, leaving a loop. Bring needle up through the loop, pull gently to tighten, and then push needle down through next hole. Repeat along edge.

## Image



3

## Sublimation Process



6

### The Central Processing Unit

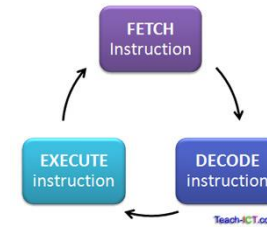
<b>INSTRUCTIONS</b>	A single action that can be performed by a computer processor.
<b>CPU Central Processing Unit</b>	The CPU is also known as the processor or microprocessor. The CPU is responsible for executing a sequence of stored instructions called a program.
<b>Arithmetic Logic Unit ALU</b>	The arithmetic and logic unit (ALU) is where the CPU performs the arithmetic and logic operations. Every task that your computer carries out is completed here
<b>RAM</b>	RAM is a fast temporary type of memory in which programs, applications and data are stored. Here are some examples of what's stored in RAM:
<b>ROM</b>	memory that cannot be changed by a program or user. ROM retains its memory even after the computer is turned off. For example, ROM stores the instructions for the computer to start up when it is turned on again.

### Base Number system keywords

<b>Binary</b>	Counting using base 2 (0s & 1s) – the only language that computers truly understand. 0 means off, 1 means on.
<b>Denary</b>	Counting using base 10 (0-9) – these are our normal numbers that we use every day.
<b>Bit</b>	The smallest amount of data (stands for binary digit) (0 or 1).
<b>Byte</b>	8 bits.

### Bits to Bytes

<b>Bit</b>	The smallest amount of data (stands for binary digit) (0 or 1).
<b>Byte (B)</b>	8 bits
<b>Kilobyte (KB)</b>	1024 bytes
<b>Megabyte (MB)</b>	1024 kilobytes
<b>Gigabyte (GB)</b>	1024 megabytes
<b>Terabyte</b>	1024 gigabytes



### Fetch – Decode – Execute

<b>1</b>	<b>Fetch</b>	Gets the instructions that it needs to run from the RAM of the computer
<b>2</b>	<b>Decode</b>	Breaks down the codes (to binary – 0s and 1s) to perform instructions
<b>3</b>	<b>Execute</b>	Based on instructions it can perform difficult calculations or move data from one memory place to another create an output

### Binary Place Values (for 1 byte)

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

### Hardware

Hardware	The components kept inside a computer
<b>Peripheral</b>	A device which can add extra functionality to a computer system. Peripherals can either input or output data from the computer.
<b>Input</b>	A peripheral device which takes data from the real world and enters it into a computer systems.
<b>Output</b>	A peripheral device which takes data from a computer system and presents it into the real world.
<b>Storage</b>	Devices that store virtually all the data and applications on a computer.
<b>Motherboard</b>	Connects all components in the computer together.
<b>Hard Drive</b>	Stores information in long term memory.
<b>Fan</b>	Used to cool down the components and prevent them from overheating.
<b>Assistive technology</b>	Any object or system that increases or maintains the capabilities of people with disabilities.
<b>Power Supply Unit (PSU)</b>	Inputs power to the system.

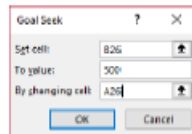


## Vocabulary

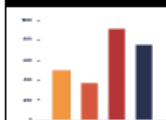
Absolute cell reference	Cell reference that does not adjust to its new location when copied or moved.
Autofill	Automatically replicates data and formulae into cells.
Autosum	A function that automatically adds the values in a range.
Break even	To not make a profit, not make a loss, but arrive at an outcome of zero.
Chart	A graphical way to show data.
Filter	Allows you to display only certain data to make it easier to find specific information in a table.
Formula	Equation that performs a calculation on values in a worksheet.
Function	A built-in formula that makes it easy for you to perform common calculations.
Goal seek	A process that automatically works out a specific required value by changing the value in a related cell.
Hide/unhide	Show or reveal selected rows or columns.
Model	a computer program that is designed to simulate what might (or what <i>did</i> ) happen in a situation.
Print area	Setting the print area restricts what is going to be printed. This is important when trying to fit a large spreadsheet on to one page while printing.
Range	A group of cells on a worksheet identified by the cell in the upper left corner and the cell in the lower right corner, separated by a colon. For example, A1:B20.
Relative cell reference	Cell reference that adjusts automatically when moved or copied.
Replicate	Another word meaning "to copy", especially for formulae.
Sort	Arranging the contents of a range in ascending (A to Z) or descending (Z to A) order.
Spreadsheet	A grid of rows and columns containing numbers, text, and formulas. Used to solve number-based problems.
What if...? questions	Types of questions that explore different possible events or situations.
Worksheet	The workspace where you enter data.

## Spreadsheet Functions

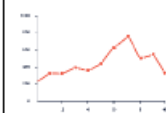
<b>AVERAGE</b>	Shows the average of values in a range	<b>=SUM</b>	Adds up the total value of the cells in a range
<b>MAX</b>	Displays the biggest value from the range	<b>=MIN</b>	Displays the smallest value from the range
<b>IF</b>	A logical function that can be helpful in decision-making. It tests to see if a condition is true or false, e.g. <b>=IF(A1&gt;75,"Pass","Fail")</b> If the value in cell A1 is greater than 75, it will display <b>Pass</b> . If it is not, it will display <b>Fail</b> . Text strings must be inside quotation marks.		
<b>COUNTIF</b>	A logical function that counts the cells within a range that meet criteria you specify, e.g. <b>=COUNTIF(A1:A25,"apples")</b> This will show the number of cells from the range A1:A25 that contain the word <b>apples</b> .		
<b>AVERAGEIF</b>	A logical function that displays the average of values in cells within a range that meet criteria you specify, e.g. <b>=AVERAGEIF(B5:B30,"male",D5:D30)</b> This will show the average value from the cells in column D that are on the same row as a cell in column B that contains the word <b>male</b> .		
<b>=SUMIF</b>	A logical function that displays the sum total of values in cells within a range that meet criteria you specify, e.g. <b>=SUMIF(D2:D20,"Toyota",E2:E20)</b> This will add up and display the total values from column E that are on the same row as the cells in column D containing the word <b>Toyota</b> .		
<b>Numerical operators</b>			
<b>&gt;</b>	greater than	<b>&lt;</b>	less than
<b>&gt;=</b>	greater than or equal to	<b>&lt;=</b>	less than or equal to
<b>=</b>	equal to	<b>&lt;&gt;</b>	not equal to
<b>Goalseek</b>	A process that automatically works out a required value by changing the value in a related cell. In the example to the left, we are setting the value of B26 to 500 by changing cell A26. This can be very useful when working on an incomplete model.		



## Representing Data Graphically



Bar charts are used to **compare variables**. They can appear vertically (also called a column chart) or horizontally.



Line graphs are used to show **trends over time**.



Pie charts are used to show the **components of a larger whole**.



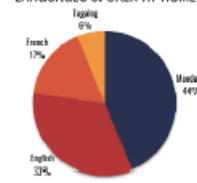
Conditional formatting applies formatting to a range based on the contents of the cells. A common approach is a **heat map** like the example to the left.

## Key components of a chart

<b>Title</b>	No chart is complete without a descriptive title. Think carefully when naming a chart.
<b>Axes</b>	The horizontal and vertical axes of your chart should be labelled and use appropriate units.
<b>Series</b>	The name given to a row or column of numbers plotted in a chart.
<b>Data labels</b>	It is essential that data displayed graphically is well-labelled to enable the viewer to understand the data being presented.

## Examples

LANGUAGES SPOKEN AT HOME



CLASS AVERAGE SCORE

