Curriculum Companions

Year 9

Term Two

Name:

Tutor Group:

Stmarks ACADEMY

Drama | What skills do I need to be successful in Drama? | Skills Organiser

Drama: Term 1 – Skills Dictionary:

Rank yourself based on your confidence in each skill in week 1 and in week 12
4= Excellent understanding (no areas for development, fully consistent)
3= Good understanding (many strengths and a few areas for development, consistent)
2=Basic understanding (some strengths and some areas for development, mostly consistent)
1=No understanding (few strengths and many areas for development, inconsistent)

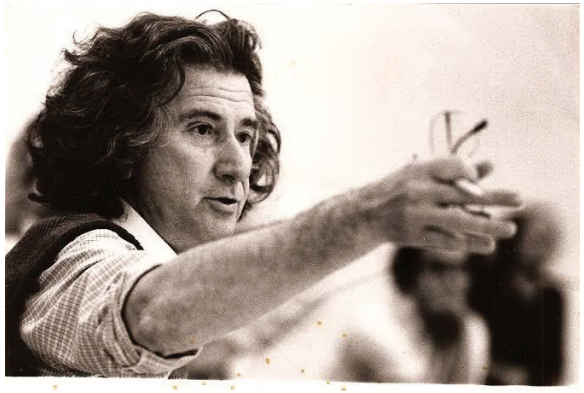
Vocal Skill	Definition	Examples of how to improve	1	12
projection	Using the voice to fill the performance space. E.g: An actor working in the hall will have to project more than an actor performing in the studio. **Projection** is important because the audience need to hear you.	. Diaphragm exercises. Breathing exercises Vocal warm ups.		
articulation	Speaking clearly so the dialogue can be understood.	Vocal Warm Ups Tongue twisters Focus on consonants		
tone	Communicating emotion with the voice	Knowing character and their motivation: Units and objectives Subtext Given Circumstance Opera exercise.		
pace (voice)	How fast or slow you speak.	Recording dialogue. Extreme Slow down Extreme Speed up		
volume	How loud or quiet you are.	Play with volume, Extremely loud/ quiet. Note impact.		
pitch	How high or low the voice is	Scales		

Physical Skill	Definition	Examples of how to improve	1	12
gesture	Using the body to communicate character/ emotion.	Exaggeration Selecting key words Mime		
facial expression	Using the face to communicate character/ emotion.	Facial warm ups – chewing toffee etc Rehearsing with a mirror.		
pace (movement)	How fast or slowly you move	Jacques LeCoq's 7 levels of tension.		
levels	How high or low you are compared to something/someone else	Utilising blocks/chairs etc		
space	The distance between two people or things.	Draw the stage out using masking tape.		

Term 2 | Exploring Practitioners | Knowledge Organiser

Boal

- A Brazilian Practitioner
- They used theatre as a political tool to help the people of South America find their voices and challenge dictatorships.
- His style of theatre became known as the 'Theatre of the Oppressed'



Week	What will I learn?
1	Drama Games
2	The Spect-actor
3	The Joker
4	Applying techniques
5	Applying techniques
6	Performance

To explore Boal, we will be using drama games, improvisation and devised performance

Half term 2 Finding Max (Devising)	
Forum Theatre	A type of theatre in which the audience can influence the outcome of the play
Spect-actor	Someone who engages in Forum Theatre
Joker	Someone who facilitates Forum Theatre
Oppression	Cruel or unjust treatment by someone with more power over those with less power

Term 1 | How can I track my development in Drama? | Knowledge Organiser

	Checkpoint 1	Checkpoint 2	Checkpoint 3
	❑ I lead my ensemble and ensure everyone's ideas are heard. ❑ I am always focused in rehearsal and **encourage others to do so as well.** ❑ I apply a range of Boal's techniques effectively. ❑ I include physical and vocal skills to enhance the performance. ❑ I interpret the characters with innovation and creativity	❑ I lead my ensemble and ensure everyone's ideas are heard. ❑ I am always focused in rehearsal and **encourage others to do so as well.** ❑ I apply a range of Boal's techniques effectively. ❑ I include physical and vocal skills to enhance the performance. ❑ I interpret the characters with innovation and creativity	❑ I lead my ensemble and ensure everyone's ideas are heard. ❑ I am always focused in rehearsal and **encourage others to do so as well.** ❑ I apply a range of Boal's techniques effectively. ❑ I include physical and vocal skills to enhance the performance. ❑ I interpret the characters with innovation and creativity
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Term 2 | Exploring Practitioners | Knowledge Organiser

Lin Manuel Miranda

- Lin Manuel Miranda is a Puerto-Rican American.
- He has been a pioneer of Musical theatre,
- He created the Broadway musicals In the Heights (2005) and Hamilton (2015), and the soundtracks for the animated films Moana (2016), Vivo, and Encanto (both 2021).
- He has received numerous accolades including a Pulitzer Prize, three Tony Awards, two Laurence Olivier Awards, two Primetime Emmy Awards, and five Grammy Awards, along with nominations for two Academy Awards.

Week	What will I learn?
1	Musical theatre
2	Hamilton
3	Moana
4	In the Heights
5	Encanto
6	Applying techniques

To explore Miranda, we will be using a range of Musical Theatre techniques.

Half term 2 Finding Max (Devising)	
Action	The development of the plot
Libretto	The script printed with all music
Exposition	an explanation, normally in the dialogue, of events preceding the beginning of a dramatic piece or taking place offstage, and which the audience needs to know
Stagecraft	Producing or participating in the technical aspects of theatre

Term 2 | How can I track my development in Drama? | Knowledge Organiser

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Y9 English | Noughts and Crosses | Knowledge Organiser

1. How does Blackman use a dystopian society to reflect our own?

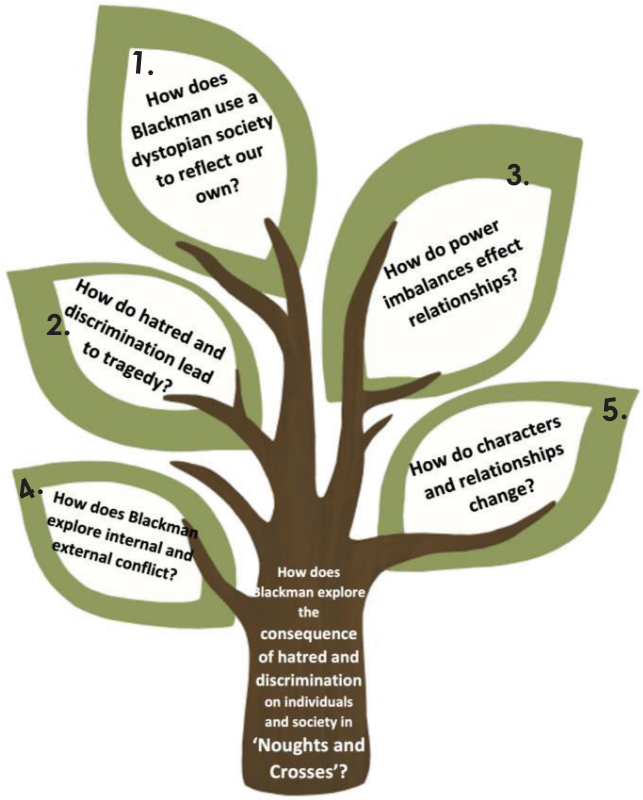
- Blackman flips racism to show how it feels to be oppressed.
- Segregation in the book reflects real-world racism like the South African apartheid, segregated America
- Sephy and Callum's love shows how prejudice hurts lives.
- The story highlights unfair systems and how people resist them.

2. How do hatred and discrimination lead to tragedy?

- **Broken Relationships:** Hatred and discrimination destroy Sephy and Callum's love, tearing them apart and causing deep personal pain.
- **Cycle of Violence:** Prejudice fuels anger and rebellion, leading to tragic consequences like deaths and shattered families.
- **Lost Potential:** Discrimination stops characters like Callum from achieving their dreams, showing how unfair systems ruin lives.
- Forbidden love links to Romeo and Juliet

3. How do power imbalances effect relationships?

Power imbalances strain Sephy and Callum's relationship, as Sephy's privilege as a Cross clashes with Callum's hardships as a Nought. These divides also create tension within their families, with Callum's family turning to rebellion and Sephy's family enforcing the racist system. Friendships are tested or destroyed by prejudice, mistrust, and societal pressures, leading to conflict, heartbreak, and ultimately, tragedy.



4. How does Blackman explore internal and external conflict?

- **Sephy's Internal Conflict:** Sephy struggles with her privileged position as a Cross and her love for Callum, feeling torn between her beliefs and her family's racist views.
- **Callum's Internal Conflict:** Callum grapples with feelings of anger and helplessness as a Nought in an oppressive society, while trying to maintain hope and protect his loved ones.
- **External Conflict in Families:** Callum's family, especially his mother Meggie and brother Jude, experience division over how to resist oppression, with Jude turning to violent rebellion. Meanwhile, Sephy's family enforces Cross dominance, with her father prioritising power over his daughter's happiness.
- **Friendships Tested:** Callum's childhood friendship with Sephy and relationships with others, like his sister Lynette, are strained or destroyed by societal divisions and personal choices.
- **Societal Conflict:** The overarching racial divide between Noughts and Crosses drives protests, violence, and tragic events, impacting every character and revealing the far-reaching effects of prejudice.

5. How do characters and relationships change?

Sephy and Callum grow as they face the harsh realities of prejudice, shifting from innocence to a deeper understanding of the world's injustices.
Characters such as Jude and other members of the LM evolve by becoming fuelled by more hatred.

Y9 English | Nought and Crosses | Topic Dictionary

Image	Word	Definition	In a sentence
	**ambiguous**	Something that is unclear or confusing because it can be understood in more than one way.	Noughts and Crosses ends with a sense of **ambiguity**.
	**equality**	The same status, rights, and responsibilities for all the members of a society, group, or family.	The noughts fight for **equality** as they deserve the same rights as Crosses.
	**justice**	Fairness in the way that people are treated.	Fair and equal treatment towards noughts is the only way they can get **justice**.
	**militia**	A group of people who have been trained as soldiers but are not part of a country's official army.	The Liberation **militia** are a group of people that protest/riot against the discrimination and mistreatment of noughts.
	**prejudice**	An unreasonable dislike of a particular group of people or things, or a preference for one group of people or things over another.	The crowd at the school behave in a **prejudiced** way when they protest against Callum joining their cross school.
	**privilege**	Someone who is privileged has an advantage or opportunity that most other people do not have, often because of their wealth or high social class.	Sephy has a lot more **privilege** than Callum as she is a Cross and part of the superior race in the dystopian world.
	**radicalisation**	The process in which a person or group believes great change should be introduced and uses or condones violence, including acts of terrorism, to reach that purpose.	Jude is a victim of **radicalisation** as he uses violent means in order to fight for the freedom of noughts.
	**rebellion**	A rebellion is an act of armed resistance to a government or leader.	The LM spark a **rebellion** against the government that controls them.
	**relentless**	Something bad that never stops or never becomes less intense.	Both sides of the protest are **relentless** in their arguments.
	**reprieve**	To stop or delay the punishment, especially by death, of a prisoner.	Ryan was given a last minute **reprieve** before his planned execution.
	**segregation**	The official practice of keeping people apart, usually people of different sexes, races, or religions.	The main in this dystopia is **segregation** between races.

Y9 English | Nought and Crosses | Topic Terminology

Word	Definition	In a sentence
aside	A comment that a character in a play makes to the audience, which the other characters are supposed not to be able to hear.	We see Callum do an **aside** when he talks to himself out loud.
characterisation	The way an author, playwright or actor describes or shows what a character is like.	In plays, voice, body language, movement and gesture are considered during **characterisation**.
dual narrative	A story that is told from two different perspectives.	Nought and Crosses is written in the **dual narrative** of Callum and Sephy.
juxtaposition	A type of opposition between two ideas or objects used to highlight the difference between them.	The **juxtaposition** of life for the noughts and crosses is evident throughout the play
proxemics	How close or near to each other the characters are on stage. This is used to communicate meaning	**Proxemics** can be used to show a character is scared of another character by having them stand far away.
soliloquy	A speech in a play in which an actor speaks to himself or herself and to the audience, rather than to another actor.	Noughts and Crosses contains many **soliloquies** so that the audience can understand how characters are feeling.
staging	The staging of the play is the choice of performance space for a play, usually decided by the playwright or director.	The **staging** in the play can include a spotlight on whichever character the audience should focus on.
structure	The structure of a text refers to its shape as a whole. This can man the order of plot events.	The **structure** of a text is made up of It includes the exposition, rising action, climax and resolution.
symbolism	An idea or shape that is used to represent something else. Symbolism is the use of symbols to represent something.	The suffering of noughts **symbolises** the suffering of black people due to racism.
tension	A feeling that is produced in a situation when people are anxious and do not trust each other, and when there is a possibility of sudden violence or conflict.	There is **tension** when Callum joins the school for Crosses.

Y9 English |Nought and Crosses| Act 1 Quote Bank

Use these quotes to revise for your main assessment. Think about the following questions

1. *What is being said in the quote? What tone/emotion is it said in?*
2. *Which method/technique is being used? What is the impact?*
3. *What does this quote tell me about Noughts & Crosses?*
4. *Why might have Malorie Blackman used this? What is her message?*

"You're in now. They accepted you**." –** Sephy	"Maybe we are in different worlds" - Callum	'They were legitimate targets' - Ryan
"Stop it! You're all behaving like animals!...Worse than animals! Like blankers!" - Sephy	"No blankers in our school! No blankers in our school! No blankers in our school!" – Crowd	'My family's private beach' - Sephy
"I started watching people… and there were so many differences they swamped the similarities" - Sephy	"Everyone knows they're all muggers and they hang around in gangs and knife people and listen to crap music"– Lola	'our run down hovel' - Callum
"We should be able to educate our own. Not wait for the Crosses to do it for us" – Meggie	"Callum, it's me. Sephy. I'm not your enemy" – Sephy	'He was with his dagger friend.' – Jude (his first line)
"All our lives criss-crossing but never really touching. A world full of strangers living with all that fear" – Sephy	'It's alright for them to use violence when they please, to keep us in poverty and bleed us dry. But when we fight back, they call us cowardly and barbaric.' - Ryan	'Long live the Liberation Militia!' - Jude

Explore how Malorie Blackman presents hatred in Scene 3.

Act 1 Scene 3

At the school gates.

Sephy: First day of school. I groaned at the thought. At least today would be different from the start of every other new term. Three noughts, including Callum, were starting at my school. I wanted to show him the playing fields and the swimming pool, the gym and music rooms, the dining hall and science labs. And I'd introduce him to all my friends. It was going to be wonderful, But as I approached the corner, shouting like an angry wave, they rolled towards me.

An angry Cross crowd – parents and students.

Crowd: No blankers in our school! No blankers in our school! No blankers in our school!

Mr Corsa: As the Headmaster of this school it is my legal duty to ask that you let the new students enter the school.

The crowd continues.

Crowd: No blankers in our school! No blankers in our school! No blankers in our school!

***Sephy** watches as **Callum**, **Colin** and **Shania**, all noughts, try to push their way through the crowd to get to the school entrance. **Police** try to push the crowd into two separate groups. **Mr Corsa** is in the other side of the crowd looking on. **Shania** is hut by a stone.*

Protestor 1: One of them is hurt.

Protestor 2: A blanker's hurt.

*Other protestors cheer. The struggle continues. **Sephy** gets through.*

Sephy: Mr Corsa, we have to help that girl. She's hurt!

He doesn't move.
***Sephy** addresses the crowd.*

Sephy: Stop it! Just stop it!

Crowd: Blankers out! Blankers out!

Sephy: Stop it! You're all behaving like animals.

The crowd silences.

Sephy: Worse than animals! Like blankers!

Callum: [*Aside*] She didn't say that. She couldn't have. Not Sephy… I'm not a blanker. I may be a nought but I'm worth more than nothing. I'm not a blanker. A waste of time and space. A zero. A nothing.

Step 1: Annotate the question

- Focus on key word – Underline or Circle them.
- Look for the **key theme** that is the focus of the question.

Step 2: Read the extract

- Bullet point your ideas about the **key theme** in the text.

Step 3: Thesis Statement

- Summarise your ideas from your bullet points to detail your opinion of how the question focus is outlined in the text.

Step 5: Paragraph Planning

- Number your bullet points
- Choose which quotes you will use to support each point

Step 6: Writing

- Use your plan to begin writing with a layered analysis of quotes.

You will write your **practice assessment** answering this question.

For your **final assessment**, you will answer a question based on the whole of Act 1. The quote bank will be provided.

Y9 English | Noughts and Crosses | Paragraph Writing Guide

Writing an analytical paragraph:

WHAT?

***Clear topic sentence: What* is the writer presenting or character saying?**

- How could I reuse the words in the question to give myself a topic sentence?
- Have I placed it? Locate which chapter/scene/section the quotation is from.

HOW?

***How does the writer* convey/ present/ develop this?**:

- What **tone** is the quotation spoken in or narrated in? And why?
- **Powerful words**: Which words and phrases convey the most meaning?
- What different **connotations** do these words/ phrases have? What do they make you imagine, think about or feel? Explore layers of meaning and nuanced interpretations.
- **Language:** Are there any other **techniques** the writer is using? What are their impact?
- **Challenge:** How do the meanings of words and techniques work together to create meaning? Explore **layers** of impact.
- **Challenge:** Is it part of a **wider method** used by the writer? Is the writer crafting a build-up or sequence of things e.g. verbs, motifs?

WHY?

***Why* does the writer write it?**

- Consider context and impact: what attitudes are revealed?
- Is the writer trying to create shock or sympathy/ to expose or criticise/, to warn or to promote an attitude or feeling?

Remember to link back to the key words of the question here.

Y9 English | Analytical Writing | Annotated Exemplar

Malorie Blackman presents hatred in Scene 3 through the protesting of the Cross crowd when Callum and two other noughts are entering the Cross school. This is seen through the repetition of 'No blankers in our school!'. Firstly, the use of an exclamation mark here indicates the Crosses are shouting, perhaps in a threatening way, which displays their strong hatred for noughts. The repetition develops the idea they are speaking in a threatening way and attempting to intimidate the noughts into not entering the school. Moreover, the word 'blankers' is a derogatory term for noughts, deriving from the word 'blank'. The use of this word displays hatred as it implies that the Crosses view noughts as nothing, as people not worthy of kindness or respect. The term 'blankers' reflects our real society as it mirrors the use of the 'n' word, which is a slur directed towards black people and dates back to the slave trade. In doing so, Blackman makes it clear that this hatred must be condemned. Ultimately, Blackman presents hatred through vile and degrading language and clear discrimination.

I consistently link back to the question by using the word 'hatred'. This makes my argument clear.

I include a quote and identify which writing technique has been used.

I have layered my analysis by explaining the impact of the techniques/methods the writer has used.

I zoom in to the meaning of words in the quote and how it answers the question.

I link my quote to context and explore how this further creates meaning.

Challenge: I comment on the writers intention and link it back to the question.

Geography | Does the world have enough resources? | Knowledge Organiser

Water is finite meaning we cannot make more but **demand for water is increasing**. Reasons for increase include: **2.**


Increase in manufacturing


Increased domestic use


Increased irrigation


Increased electricity production

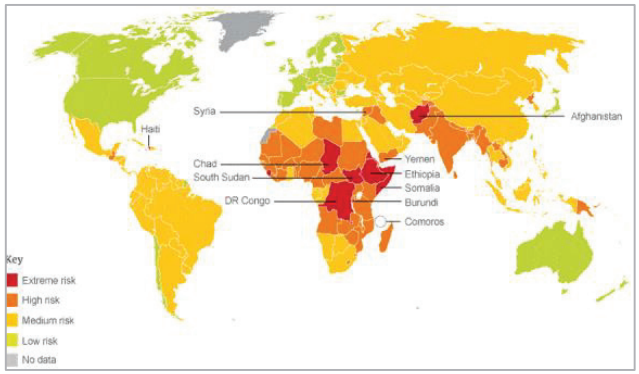

Increased meat production

As a Year 9 Geographer, I know…

1. What a natural resource is and where concentrations of natural resources can be found.	
2. What water is used for globally and reasons why global water usage is increasing	
3. The three problems with water use in India.	
4. Ways to reduce water stress.	
5. Where food security impacts the most.	
6. How we could increase food supply	
7. How are electronics are made.	
8. The issues relating to resource extraction	

Ways to reduce water stress **4.**

Food insecurity usually impacts LICs more than HICs who can afford to import food and keep food prices manageable for their populations. The choropleth map below shows the areas high and low food risk. **5.**



Supply chain for a mobile phone **7.**

- Mining (in LICs)
- Processing of raw materials (in LICs)
- Manufacturing (in NEEs)
- Quality control (in HICs)
- Distribution of products (in HICs)
- Consumer buy the products (in HICs)

India has a growing population currently at over 1.4 billion and now cannot provide the whole population with clean drinking water. **3.**

There are 3 major causes of this problem.


Changing rainfall patterns – areas previously used for farming now receive low rainfall levels.


Overuse of groundwater – leading it to run out in many areas.


Polluted rivers – water no longer available for human use

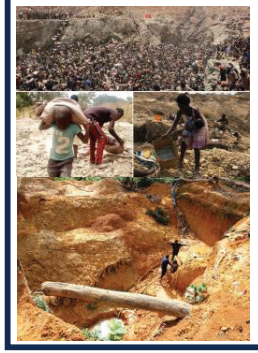
Food supply can be increased using many methods such as: **6.**

Hydroponics- Using nutrient rich water to grow crops in buildings in urban areas.

GM crops- By genetically modifying crops they can withstand droughts or be made more calorific

Irrigation- Watering crops allows more to grow in areas that would otherwise be too dry.

Problems with resource extraction in the Democratic Republic of Congo. **8.**



Many children working in mines

Communities have to move out of areas to make space for mines.

Safety standards are very low in the mines leading to accidents injuries and deaths.

Mining can lead to soil erosion and loss of fertile land.

Miners' exposure to toxins can lead to health problems.

Geography | Does the world have enough resources? | Topic Dictionary

Image	Key word	Definition	In a sentence
	**agricultural use**	Something that is used when farming.	**Agricultural water use** is the largest use of water globally.
	**domestic use**	Something that is used in the home.	Water is **used domestically** for showering, cooking and flushing toilets.
	**finite**	Having an end or limit	Water is **finite** this means that we cannot make new water. There is the same amount of water on Earth as when the dinosaurs walked the Earth.
	**food insecurity**	Not having access to enough food, or food of an adequate quality, to meet one's basic needs.	**Food insecurity** is a serious problem affecting millions of people around the world, particularly in LICs.
	**genetically modified food**	Created by changing the DNA of plants or animals to give them new traits, like resistance to pests or improved nutrition	Some people oppose **genetically modified foods** because they worry about potential health risks and environmental impacts.
	**groundwater**	Water held underground in the soil or within rocks. An underground store of water is called an aquifer.	Historically, populations in India heavily relied on **groundwater r**esources for irrigation
	**hydroponics**	A method of growing plants without soil, using nutrient-rich water solutions.	One benefit of **hydroponics** is that it allows for year-round crop production, regardless of climate or season.
	**industrial use**	Something that is used in businesses, factories or schools.	**Industrial water usage** is greater in HICs than in LICs.
	**irrigation**	The practice of supplying water to crops and plants.	**Irrigation** helps farmers grow crops even in dry climates, ensuring a reliable food supply.
	**natural resource**	Materials from the Earth that are used to support life and meet people's needs.	Chad has valuable **natural resources** like oil and cotton.
	**resource extraction**	Resource extraction is the process of taking out usable materials from the Earth.	One example of **resource extraction** is drilling for oil.
	**supply chain**	A supply chain includes every step that is involved in getting a finished product or service to the customer.	The **supply chain** of a mobile phone involves a complex network of countries, companies, and resources, from mining rare earth minerals to assembling the final product.
	**water stress**	When there is a situation in which the water resources in a region or country are insufficient for its needs.	**Water stress** occurs when increasing populations and climate change put pressure on water resources.

Geography | Does the world have enough resources? | Skills Guide

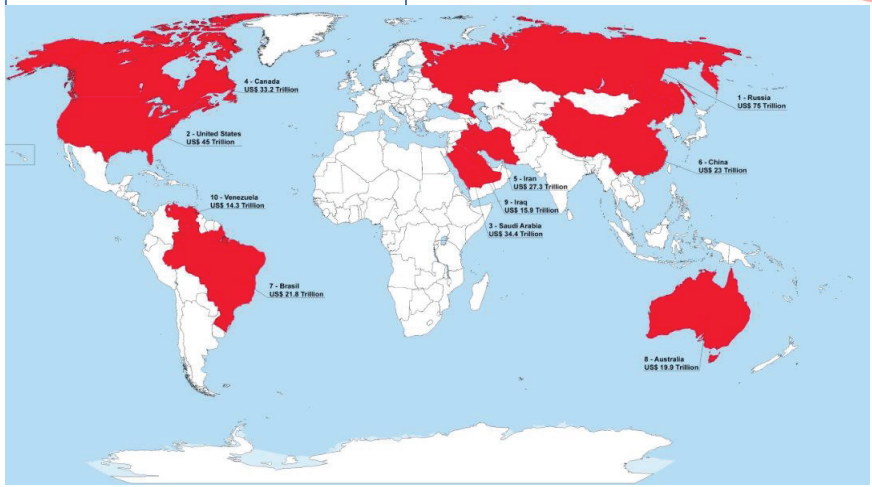
Describing patterns on a map

If you are asked to describe a pattern on a map the following structure will help you. Remember if you are describing a pattern, you do not need to say why it has happened – just what you see.

Trend – what this the overall pattern of the map.
Examples – pick out examples that support the overall pattern
Anomalies – is there any part of the data that doesn't fit the overall trend

TEA in action.

1.

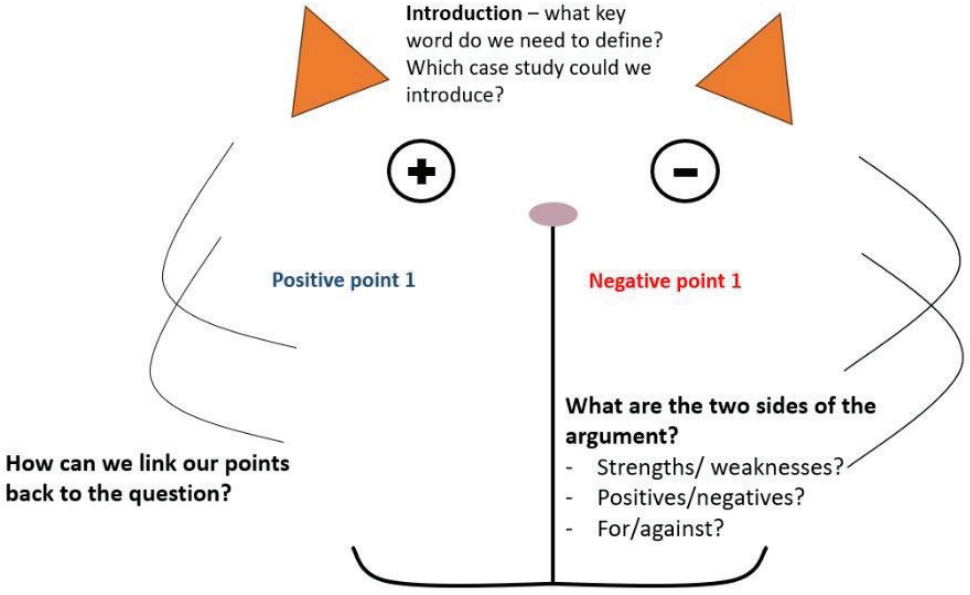


Describe the change in the amount of carbon dioxide in the atmosphere shown in figure 1.

Overall, the map shows that the majority of countries with the most resources are HICs . Russia has the largest amount of natural resources with the total value being . However, a notable exception is Iraq who have the 9th highest value of natural resources despite being an LIC.

How to assess

	Assess	Make an informed judgement. Present both sides of an argument and use evidence to make your judgement.



Consequently
As a result of
Therefore
This means that

Within our responses it is important that we expand our points in order to show our geographical ability to explain our points.
CATT statements will help us do this.

Geography | Is the World Equal? | Knowledge Organiser

What are the barriers to equal education? 1.

Geographic Location - Students in rural areas may have limited access.

Disability – Lack of accommodation for disabilities.

Political instability and conflict – Schools may be damaged or closed.

Language – Students may struggle to learn second languages.

Cultural and religious beliefs – In some cultures girls are discouraged from attending school.

Socio-economic factors – Low-income families can lack access to opportunities.

Why are some countries HIC's and some LIC's ? 2.

Colonisation – Powerful countries stole from smaller countries.

Globalisation- The befits of globalisation are not felt equally.

Corruption – Some governments are not fair to their people.

Conflict – War leads to destruction of property and social disruption.

Discrimination- When one group is discriminated, they are unable to participate fully in society.

The supply Chain of Jeans – 3.

Raw Material is grown; this is then turned into yarn so that It can be manufactured into jeans and sold in shops.

Factors influencing ethnic inequality

– justice system, education, media, and employment patterns.

Factors affecting health inequality. 4.

Ethnicity – Ethnic minorities often face disparities in health care.

Gender- Women and men have different health needs that are not always met equally.

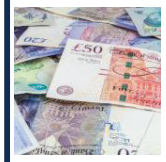
Occupation – Certain occupations expose individuals to significant health risks.

Education – Education plays a crucial role in promoting health and well-being

Socio-economic status - Lower socioeconomic status is a significant driver of health inequality

Factors affecting gender inequality. 5.

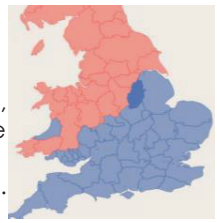
Culture – Cultural norms and traditions can deeply embed gender roles, often limiting opportunities for women



Socio-economic factors In developing countries, women often bear the brunt of poverty, as they are more likely to be engaged in low-paying, informal work. always met equally.

Political factors – Discriminatory laws and policies can limit women's rights and opportunities.

In May 2021, the average house price in the North East was £143,129, while the average price in the South East was £350,016.



Countries impacted by climate change are not always included in climate negotiations. 6.

As a Year 9 Geographer, I know…

1. What the different barriers are for children to access education.	
2. Why some countries are more developed than others.	
3. What a supply chain is and how trade can influence global inequality.	
4. Why not everyone receives the same health care.	
5. Why men and women are not equal.	
6. How the impacts of climate change are not felt equally.	

Geography | Is the World Equal ? | Topic Dictionary

Image	Key word	Definition	In a sentence
	**climate inequality**	The unequal distribution of the impacts of climate change, with marginalized communities often experiencing greater harm.	**Climate inequality** means that some places are more affected by climate change than others, like those that are poor or have fewer resources.
	**colonisation**	The process of one nation establishing control over another, often through settlement and exploitation of resources.	Some countries took over other countries, called **colonisation**, and controlled their people and resources.
	**equality**	The state of being equal, especially in status, rights, and opportunities.	It's important that everyone is treated **equally**, no matter who they are.
	**ethnicity**	A person's identification with or membership in a particular ethnic group, often based on shared cultural traditions or ancestry.	**Ethnicity** is about where your family comes from and the culture they share.
	**GDP per capita**	The total value of goods and services produced within a country, divided by its population. It's a measure of average income per person.	When a country is rich, it has a high **GDP per capita**.
	**gender equality**	The state of equal opportunity for all genders, regardless of their sex or gender identity.	**Gender equality** means that boys and girls should have the same opportunities.
	**health inequality**	Unequal access to healthcare services and resources, often resulting in disparities in health outcomes across different groups of people.	**Health inequality** means that some people don't have the same access to healthcare as others.
	**inequality**	The difference between levels of quality of life, income, health and education.	The world is **unequal:** the world's richest 1% have more than twice as much wealth as 6.9 Billion people.
	**nationality**	Legal membership in a specific country.	Your **nationality** is the country you belong to and where you're a citizen.
	**supply chain**	Network of organizations involved in producing and delivering a product or service, from raw materials to the final consumer.	The **supply chain** is a long journey that things take to get from where they're made to where we buy them.
	**sustainable**	Meeting the needs of current generations without compromising the needs of future generations	Solar energy is **sustainable** because it reduces air pollution.
	**trade**	The exchange of goods and services, often between countries.	**Trade** is when countries buy and sell things with each other.

Geography | Is the World Equal ? | Skills Guide

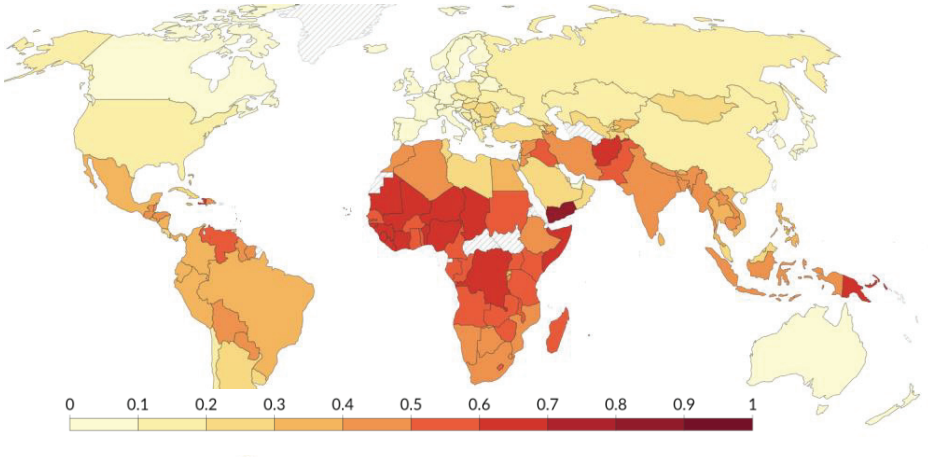
Interpreting maps

If you are asked to explain a pattern on a map the following structure will help you.

Trend – what this the overall pattern of the map.
Examples – pick out examples that support the overall pattern
Anomalies – is there any part of the data that doesn't fit the overall trend

TEA in action.

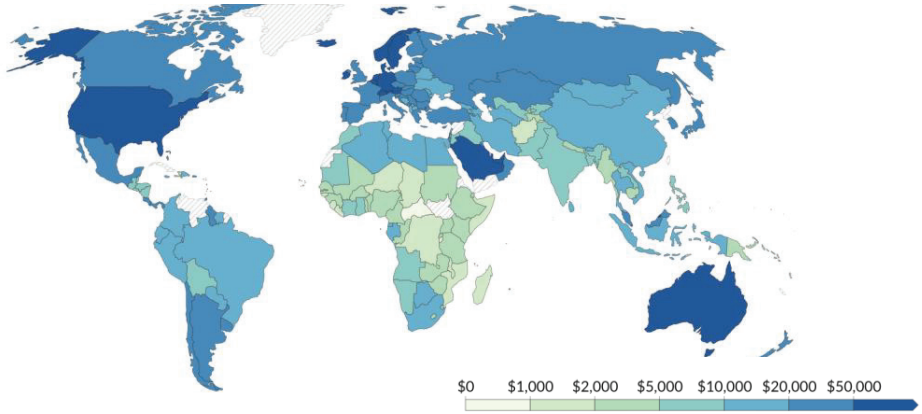
Gender inequality index 2022



Describe the map showing the difference in gender equality around the globe. (3)

Overall, the map shows that in the global south there is a greater inequality between men and women. The continent of Europe and North America both have a GII between 0.1 and 0.3 where as Africa and South America have a GII between 0.3 and 1. However, Australia which is in the global south has a GII between 0 and 0.1.

GDP per capita 2023



Describe the map showing the difference in GDP per capita around the globe. (3)

Overall, the map shows that countries that do not have access to a coastline have a lower GDP per capita than those that do. For example, Countries in central Africa have a GDP per capita between $0 and $2000.However, There are some countries in central Europe that have a high GDP per capita such as Switzerland.

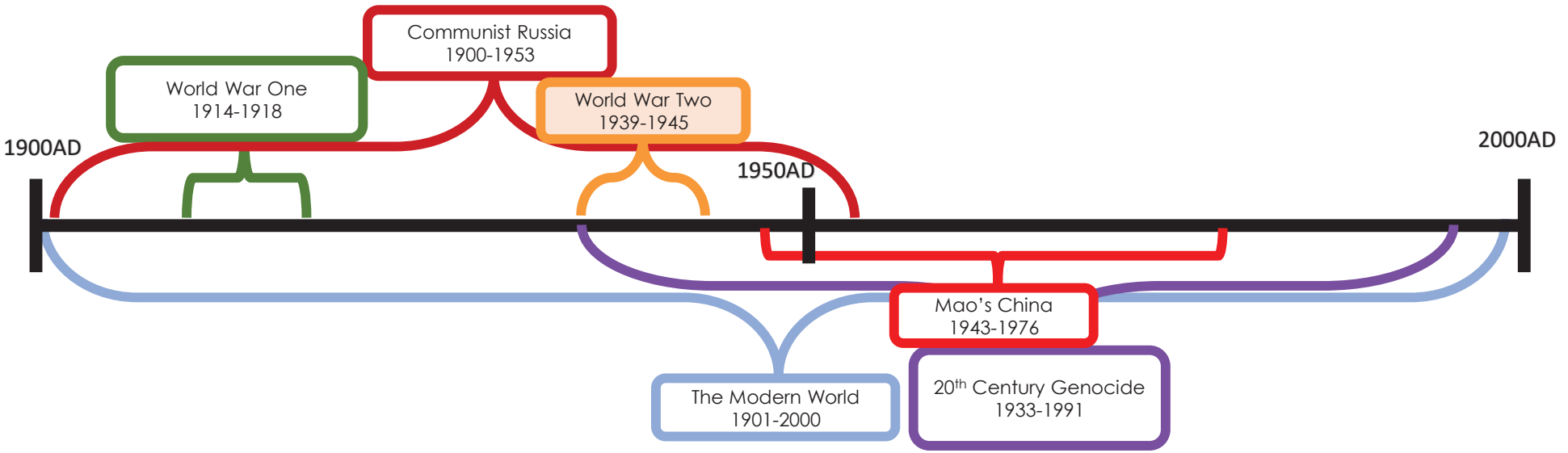
Understanding Scale.

When writing about inequality it is important to consider geographical scale – local, regional and global.

Within London there is economic inequality with the top 10% of people earning more than 60% of income. In the Uk there is economic inequality between the North and South with people in the North earning 10% less than those doing the same job in the South. Global there is economic inequality with the richest 10% of people earning 50% of global income.

History | What was the turning point of World War Two? | Topic Dictionary

Image	Key Word	Definition	In a sentence…
	**Appeasement**	The policy employed by Neville Chamberlain and Britain to give Hitler what he wanted to keep peace.	Britain deployed a Policy of **Appeasement** to keep peace
	**allies**	The term referring to Britain, France, Italy and Russia as a united force during WW2	The **Allies** declared victory in Europe on the 8th of May 1945
	**atomic**	Weapons of mass destruction that involve	The bomb dropped on Hiroshima and Nagasaki was an **atomic** bomb
	**Axis**	The term referring to Germany, Italy and Japan as a united force during WW2	The **Axis** powers were defeated at the Battle of Stalingrad
	**evacuation**	The process of moving people from a dangerous place, to somewhere safe.	We were forced to **evacuate** London because of the war
	**invasion**	When one country attempts to take over another country by using its armed forces.	In 1939, Germany carried out an **invasion** of Poland



History | What was the turning point of World War Two? | Topic Overview

Appeasement 1
Hitler was gradually allowed to take more and more land. British Prime Minister **Neville Chamberlain** was afraid of **Hitler** and therefore, let him take. Starting with the Rhineland (which was supposed to be free of German military) Hitler then invades Austria in 1938, Czechoslovakia and the Sudetenland in 1939
1st September 1939: Germany sends 1.25 million troops into Poland. This is the last straw. Britain declares war on the 3rd of September

WW2 and Britain 2
Dunkirk (operation Dynamo), 29th May-3rd June 1941: The British expeditionary force (338,000 men) is evacuated from the small beach of Dunkirk in northern France. **Winston Churchill** calls it Britain's "finest hour". Around 900 civilian ships were involved. However, some argue that Dunkirk was a full-scale retreat and therefore a disaster. 100,000 Britons were left behind and became prisoners of war

Pearl Harbour, 7th December 1941:
The bombing of Pearl Harbour, a small US naval base in the pacific, killing 1,500 US sailors and soldiers. Japan did this so that the USA would no longer be able to stop Japan from having total control in the pacific. Additionally, the US also imposed a trade embargo on Japan. However, this backfires as **President Roosevelt**, would decide to join WW2 following Pearl harbour, a key turning point in the Axis powers' eventual defeat 4

Battle of Britain: France surrenders, leaving Britain to defend against Hitler's planned invasion (operation Sealion). Hitler's plan was to use his Luftwaffe to bomb Britain until they surrendered(Airforce) British Airforce of Hurricanes and Spitfires fight against the Luftwaffe in the skies over Britain. Britain had the advantage of radar and were building planes (hurricanes and spitfires) faster than Germany could shoot them down. Victory was achieved in September 1940 3

How did D-Day begin to end the war in Europe, 6th June 1944:
Having been planned since 1943, the allies launch a full invasion of French occupied Germany., called operation Overlord. 11,000 planes, 6,000 ships and 156,000 troops bombard the Normandy beaches to start to take back control of France. 4,000 allied troops lost their lives. From here, the allies would push on into France and eventually, into Germany itself 6

How did Hiroshima and Nagasaki end the war in the Pacific?
Although nearing defeat, Japan proved to be incredibly resilient. President Truman, believing that the Japanese would never surrender, decided to deploy the Atomic bomb, developed by Robert J Oppenheimer, on Japan to force them to surrender. Within a minute of the Nagasaki explosion 70,000 people were dead. Japan was forced to surrender on the 12th August 1945. 6

As a Year 9 Historian I know …

1. The policy of appeasement.	
3. Whether Dunkirk was a success or a failure.	
3. Why Britain won the Battle of Britain.	
4. How why the USA was joined in WW2.	
5. Whether Stalingrad was a turning points.	
6. How WW2 came to an end.	
7. What life was like for civilians.	

Stalingrad, August 1942-February 1943:
In June 1941, having failed to invade Britain, Hitler, invades Russia. Although initially successful, Stalin launches operation Uranus, a counterattack against the German invaders. Germany had overreached however, its men start to run out of food, warm clothes and weapons. Stalingrad was Germany's last stand in Russia. Russian forces held firm and eventually, German general Von Paulus surrendered. Russian sacrifices in the war were catastrophic. An estimated 20 million Russians died fighting in WW2. This is the start of the end for Germany… 5

The Nuremberg trials: In 1945 and 1946, the leading Nazis were put on trial for their crimes. Most famously, Hermann Goring, Hitler's right-hand man, committed suicide before he was executed. Albert Sper, who had overseen war production was sentenced to 20 years and Rudolph Hess, Hitler's deputy, served a life sentence. 6

The Home front: this refers to the people back home in Britain. Defence of the Realm Act, (August 1914) gave the government more control over people's lives. For example, the government was able to take control of any factory to help produce ammunition and weapons. The Blitz from September 1940 to May 1940 meant that civilians were forced to seek shelter as bombs reigned down. A third of London was destroyed. Women, as they did in WW1, stepped up and helped run factories, ensuring the war effort did not fail. 7

History Interpretations Skills Guide

An interpretation is **anything written after an event happened**. This could be a book published by a historian, a film, a painting, podcast, the list goes on. Two examples are below…

How and why do historians' interpretations of Dunkirk differ?

Interpretation A: *What you Need to Know about the Dunkirk Evacuations*, Imperial war museum website (2024)

"Churchill and his advisers had expected that it would be possible to rescue only 20,000 to 30,000 men, but in all 338,000 troops were rescued from Dunkirk…The successful evacuation was a great boost to civilian morale and created the 'Dunkirk spirit' which helped Britain to fight on in the summer of 1940."

Interpretation B: *Dunkirk's 60th anniversary broadcast*, BBC news report (2000)

"Dunkirk was a military disaster-and took the British public by surprise… but almost at once, victory was being plucked from defeat and the newspapers began to create the Dunkirk myth…the government encouraged this myth to flourish-and allowed nothing to be published which might damage morale…Dunkirk was a military defeat but a propaganda victory"

1) How do their views differ? This requires us to look at the content and understand the tone

Interpretation A views Dunkirk as a success, whilst B believes that it was a disaster and that it only appears to be a success because of the way newspapers at the time made it appear.

2) How do we know this? We need to find quotes from the source that show the difference

Interpretation A states that "338,000 troops were from Dunkirk" when it was believed at most 30,000 would be. It also states that it boosted morale back home, suggesting Dunkirk was a success. Interpretation B however states that it only appears to be a victory because of the "Dunkirk myth" created by the newspapers and in reality, was a "military disaster".

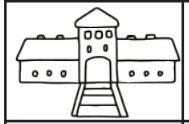
3) Why do their views differ? Here, we need to think about purpose of the interpretation

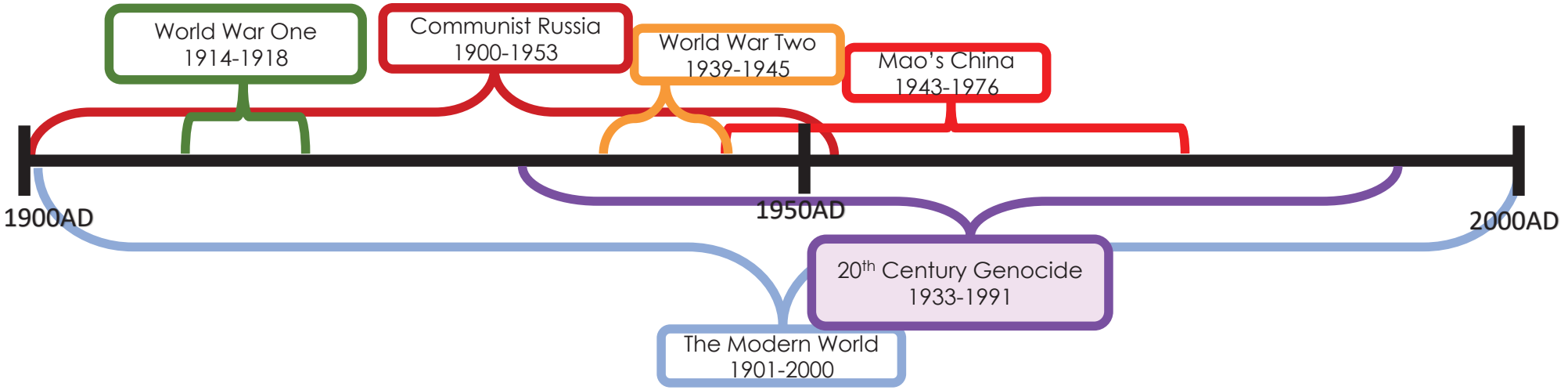
They differ because they have researched different elements of Dunkirk. Interpretation A has researched the whole of Dunkirk and may have looked at more positive sources. Whereas interpretation B researched the role of the media at Dunkirk and how Dunkirk was portrayed and would therefore have looked into more negative sources.

4) Which one do YOU agree with more and why? There is not right or wrong answer here, it's all about how you back your points up with your own knowledge

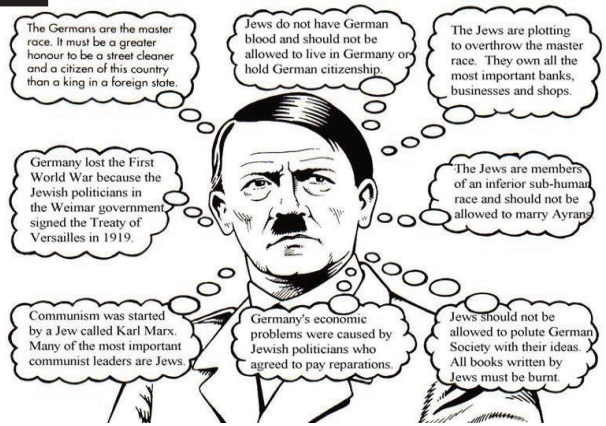
Overall, I agree more with interpretation A as following Dunkirk, the allies' spirits were lifted. This can be seen in their defence against Hitler's Luftwaffe in the Battle of Britain and their eventual rallying to defeat the Nazis following operation Overlord in June 1944. Were it not for Dunkirk, Britain and the allies might have lost the war.

History | The Holocaust | Topic Dictionary

Image	Key Word	Definition	In a sentence…
	**Antisemitism**	The prejudice, discrimination and racism towards Jewish People.	"Antisemitism has been a constant problem in Europe since the middle ages."
	**genocide**	Genocide is the intentional mass killing of a specific group of people because of a specific characteristic or feature of their identity.	"The murder of 6 million Jewish people and millions of others in World War 2 was a genocide."
	**Ghetto**	A specific, separate, area within a city of particularly low quality used to separate Jewish people from society under the Nazis.	"The Warsaw Ghetto was one of the worst Ghettos in the Third Reich."
	**Holocaust**	The genocide of over 6 million Jewish people between 1933-1945 as part of the Nazi Party's 'Final Solution'.	"The genocide of 6 million Jewish people during World War 2 is called the Holocaust."
	**Liberation**	The action of setting someone free from imprisonment, slavery, or oppression; release.	"There was a liberation of many people from their chains."
	**Resistance**	The refusal to accept, comply or 'go-along' with something.	"There were many instances of Jewish Resistance against the Holocaust."



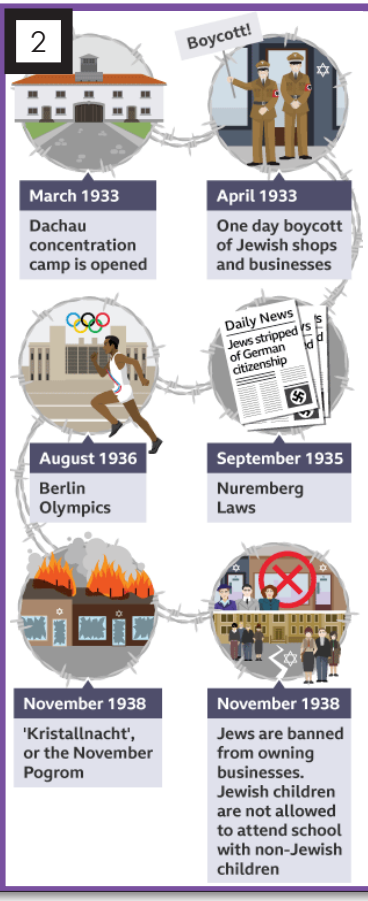
1



As a Year 9 Historian I know …

1. Why Jewish people have been persecuted.	
2. How the Nazis persecuted Jewish people in Germany.	
3. What the 'early solutions' were to the 'Jewish Problem'.	
4. What the Final Solution was and the experience in Auschwitz-Birkenau.	
5. How Jewish People resisted the Holocaust.	
6. What happened in the aftermath of the Holocaust.	

2



The Ghettos: Conditions inside the ghettos were terrible. There was no light, heat or running water. Food was almost impossible to buy. Hundreds of thousands of people died of disease and malnutrition. If people tried to leave the ghettos they were shot by the German guards.

Madagascar Plan: The German Foreign Office suggested sending the Jews to the French island colony of Madagascar. Hitler initially gave his approval to the plan which was to send a million Jews each year to Madagascar for four years. The island would be run by the SS. The Nazis hoped that once the Jews arrived in Madagascar, they would die due to the harsh living conditions. The 'Madagascar Plan' was therefore aimed at killing the Jews. This plan was abandoned.

3

Einsatzgruppen: The Einsatzgruppen were death squads were sent into Eastern Europe and Russia to kill Jews, gypsies and other enemies of the Nazi regime. The Einsatzgruppen would round up those who were to be shot. Take them to a secluded spot where they would dig a trench. They would then be lined up in front of the trench or in it and shot by German soldiers.

4

1942, the Nazis began moving the Jews from all over Europe to concentration camps or death camps.

Concentration camps were places where the Jews had to work, even though many died of starvation they were not built to mass murder the Jews. **Death camps** were only constructed with one purpose: to mass murder Jews.

Auschwitz was the largest camp established by the Germans. Around 1 million Jews died there. Escape from Auschwitz was almost impossible. Electrically charged barbed-wire fences surrounded the concentration camp and the killing centre. People were set to hard and punishing work. They were fed very little and kept in poor conditions. People were packed into wooden buildings which were freezing in winter and hot in the summer. Disease spread in these conditions.

The Warsaw Ghetto Uprising: On April 18th 1943 the Nazis made their final attempt to clear the ghetto, they were met by determined and ferocious armed resistance – this became known as the Warsaw Ghetto uprising. Resistance fighters barricaded themselves inside houses and attacked German soldiers. The Nazis used experienced German troops armed with flamethrowers to clear the buildings, which they burned to force the resistance fighters out. The Jewish fighters managed to hold out for an entire month, until they were killed or forced to surrender. 7,000 Jews were killed including the leader Anielewicz. The remainder were sent to extermination camps.

Jewish Partisans: One group near Vilna in Lithuania derailed hundreds of trains and killed 3,000 German soldiers. In Belarus there was a Jewish resistance group led by the Bielski brothers; they managed to form a group of 1200 partisans. They would attempt to sabotage Nazi activity as well as helping other Jews who escaped from camps. However, life as a partisan was incredibly dangerous, those who were captured faced execution and many were tortured for information.

5

Jews were looked after at the end of the Holocaust.	Jews were not looked after at the end of the Holocaust.
• DP camps were set up by the Allies across Austria, Italy and Germany. • Jewish DPs were recognised as a special group. • Jewish DPs took care of sanitation, hygiene, cultural activities, education, and religious life. • DP camp committees established children's homes and educational facilities. • The Red Cross and other relief organisations did all they could to help return victims home. • The announcement of the state Israel opened the door for Holocaust survivors from DP camps in Europe and from detention camps on Cyprus to enter the country.	• Survivors were in the same camps as German prisoners. • Many survivors suffered severe psychological problems. • Many Jews did not have homes, families or communities to go back to. • When the war ended Jewish survivors had no papers and no passport. • Survivors were often treated with hostility from the non-Jewish population. • A lot of Jewish property had been taken by the local people. • In Poland from the end of the war to the summer of 1946, Poles murdered approximately 1,500 Jewish survivors. • The British government refused to allow mass immigration of Jewish refugees.

6

History Source Skills Guide

In History you may get shown several sources and be asked 'how useful' they are for an enquiry into a specific environment. The following steps help us to judge this:

Content: What does the source say – or show? What does it tell you about the event or person?
Caption: Where does the source come from (provenance)?
Context: Is the source accurate? Does it match what you already know?
Conclude: Reach a judgement on how useful the sources are.

The content of the source suggests that in Auschwitz-Birkenau 'every last remnant of respect' was taken from the inmates. This is useful as it shows us how the inmates were treated by the Nazis.

This quote from the extract is useful because it is accurate. I know that when people arrived at the camps they were tattooed with a number which would be used instead of their name – taking away people's identities.

The content of the source shows that the inmates at Auschwitz-Birkenau were 'dehumanised'. This is useful as it highlights how severe the treatment of the inmates was.

This quote from the extract is useful because it is accurate. I know that inmates weren't allowed to have showers or even use the toilet. The inmates were also not given appropriate clothing for the harsh winters in Poland.

This makes the source useful as it was written by a survivor who experienced the conditions at Auschwitz-Birkenau firsthand. The source is also useful as it is an autobiography written to inform people about Greta Turgel's experience during the Holocaust. This is useful as it means that the source is likely to accurate as the author would want the audience to understand the true horrors of the Holocaust.

Overall, this source is useful as provides an insight into the experiences of inmates at concentration camps during the Holocaust.

This comes from the autobiographical book '*I Light a Candle*' written by Gena Turgel, a Polish woman who survived Auschwitz-Birkenau. During the Holocaust, her three brothers and two sisters were killed.

At Auschwitz-Birkenau, every last remnant of respect and dignity was squeezed out of us. In our loose, insect-ridden clothing and with our hair cropped or shaved, we felt completely dehumanised.

IT | Python | Topic Dictionary

Keyword	Definition	In a sentence
Algorithms	A set of commands used to perform a particular task	I use an **algorithm** to bake a cake.
Arguments	An argument is a value that goes between the brackets after the name of a function.	In print("Hello world"), the **argument** is "Hello world", because that is the value inside the brackets.
Bugs	Bugs are errors in the code.	When a program has **bugs**, it may not be able to run and instead give an error.
Camel case	A naming convention where the first word starts with a lowercase, and all words after start with a capital letter.	Examples of **camel case** are camelCase, timeToTeleport, aLongerCamelCaseName.
Command	An instruction that tells the computer to perform a certain action.	print("Hello") is a **command**.
Comments	A comment is a text annotation in the code that helps make code more readable. Comments are ignored by the computer.	In Python you can start a **comment** using the # symbol.
Computer Program	A set of instructions that tell the computer what to do. Normally read and performed from top to bottom.	You will be writing **computer programs** in Python.
Console	A console is an interface used for text input and output.	A **console** is where the user will type their response to a prompt.
Debugging	Debugging is the process of looking for bugs and getting rid of them	Programmers spend a lot of time **debugging** to ensure their code works as expected.
Error messages	An error message is a message that indicates there is an error in your code.	Python will often send **error messages** to the **console** when there is a bug.
For loop	An instruction that allows code to be repeated	Programmers use a **for loop** to repeat actions.

IT | Python | Topic Dictionary

Keyword	Definition	In a sentence
Functions	A **function** is a command that performs a specific action when called.	**print**(), and **input**() are both functions.
Indentation errors	An indent is leaving space at the start of the line, and this error happens when this has been done incorrectly.	If you forget to indent code beneath an if statement, you will get an **indentation error**.
Iteration	Repeating instructions using loops.	**Iterations** allows algorithms to be written with fewer lines of code.
Keyword	A word that has already been reserved in Python to be used for something.	In Python, you cannot name a variable "and" because this is a Python **keyword**.
Logic errors	An error that will allow the program to run, but it won't do what the programmer expects it to do.	A **logic error** will happen if the program doesn't quite do what it should do but still runs.
Maintainability	How easy something is to look after and keep using over time.	The purpose of **maintainability** is to ensure that, over time, a program can be easily maintained.
Name errors	Misspelling a name including forgetting to use a capital letter.	Typing 'pront' instead of 'print' is a **name error**.
Python	A programming language used to develop software	**Python** language is used by professional developers to create games.
Strings	A string is a series of characters held between quotation marks " " or ' '	"hello" is a **string**.
Syntax	The set of rules that define the correct combination of symbols and characters in a programming language.	In Python, one **syntax** rule is to use () after print.
Syntax Errors	A syntax error is when the program doesn't work because of an error with the rules of the code.	Missing quote marks can cause a **syntax error**.
Whitespace	The spaces/indents that need to be left at the start of certain lines of code.	Code that is being repeated inside a loop, will need to use **whitespace**.

IT | Python | Knowledge Organiser

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Username	
Email	
Password	

Turinglab
https://www.turinglab.co.uk

My Content

Farmbot Course

In Progress Continue

Core Strings

A string is a sequence of characters - such as a, b, c etc - which are surrounded either by single `'` or double `"` quotation marks.

`"hello world"` is exactly the same as `'hello world'`. However we can't mix them - this would not be considered as a string `"hello world'`.

move_forward()

`move_forward()` will move the Farmbot forward by one square in the direction it is currently pointing in.

harvest_crop()

`harvest_crop()` will harvest whichever crop is in front of the Farmbot and store it in the Farmbot inventory.

return_home()

'return_home()` will instruct the Farmbot to find the fastest path back to it's homeplate.

ship_crops()

`ship_crops()` will instruct the Farmbot to navigate to the shipping target and inform us of the inventory it has collected.

prepare_soil()

`prepare_soil()` will prepare the soil from planting, converting grass into farmland.

plant()

`plant("tomato")` will plant the crop passed in as an argument onto soil ready for planting.

Plants include: aubergine, tomato, potato, turnip and pumpkin.

turn()

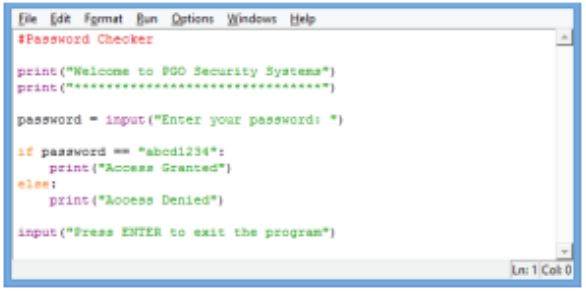
`turn("left")` will allow the farmbot to change direction. The argument "left" or "right" will determine which direction it turns.

For Loops

A `for` loop is used for iterating over a sequence such as a list, a string, a dictionary etc.

IT | Python | Knowledge Organiser

Programming with Python



Python's Development Environment

Called IDLE – Integrated Development Environment

Two Modes:

Interactive Mode lets you see your results as you type them.

Script Mode lets you save your program and run it again later.

Writing error-free code

When writing **programs**, **code** should be as legible and error free as possible. **Debugging** helps keep **code** free of **errors** and documenting helps keep **code** clear enough to read.

Syntax errors

Syntax is the spelling and grammar of a **programming language**. In **programming**, a **syntax error** occurs when:

- there is a **spelling mistake.**
- there is a **grammatical mistake.**

Data Types

String - holds alphanumeric data as text
Integer - holds whole numbers
Float - holds numbers with a decimal point
Boolean - holds either 'True' or 'False'

Defining Variable Data Types

Python automatically assigns a data type to a variable. You can override this to manually define or change the data type using:

str() , **int()** or **float()**

Selection

When designing **programs**, there are often points where a **decision** must be made. This **decision** is known as **selection** and is implemented in **programming** using **IF statements**.

Operator	Meaning	Example	Evaluates to
==	equal to	7==7	True
!=	not equal to	6!=7	True
>	Greater than	7>6	True
<	Less than	5<8	True
>=	Greater than or equal to	6>=8	False
<=	Less than or equal to	7<=7	True

Iteration

Algorithms consist of steps that are carried out (performed) one after another. Sometimes an **algorithm** needs to **repeat** certain steps until told to stop or until a particular condition has been met.

Iteration is the process of repeating steps.

Variables

A **variable** is a location in **memory** in which you can temporarily store text or numbers. It is used like an empty box or the Memory function on a calculator. You can choose a name for the box (the "**variable name**") and change its contents in your **program.**

Using a Variable (firstname)

print ("What is your name?")
firstname = input()
print ("Hello,",**firstname**)

Functions

Functions are special keywords that do a specific job. **Functions** appear in purple.

print() and **input()** are examples of functions

```
print ("What is your name?")
firstname = input()
print ("Hello,",firstname)
```

Adding Comments

Comments are useful to help understand your **code.** They will not affect the way a **program** runs. **Comments** appear in red and have a preceding # symbol.

```
#firstname is a variable
print ("What is your name?")
firstname = input()
print ("Hello,",firstname)
```

IT | Python | Skills Guide

Click on this to get further **help** with the task

Help

Green means completed, orange means partially completed, grey means not attempted.

Move forward

The Farmbot can be controlled using the command: `move_forward()`. This will move the Farmbot forward by one square.

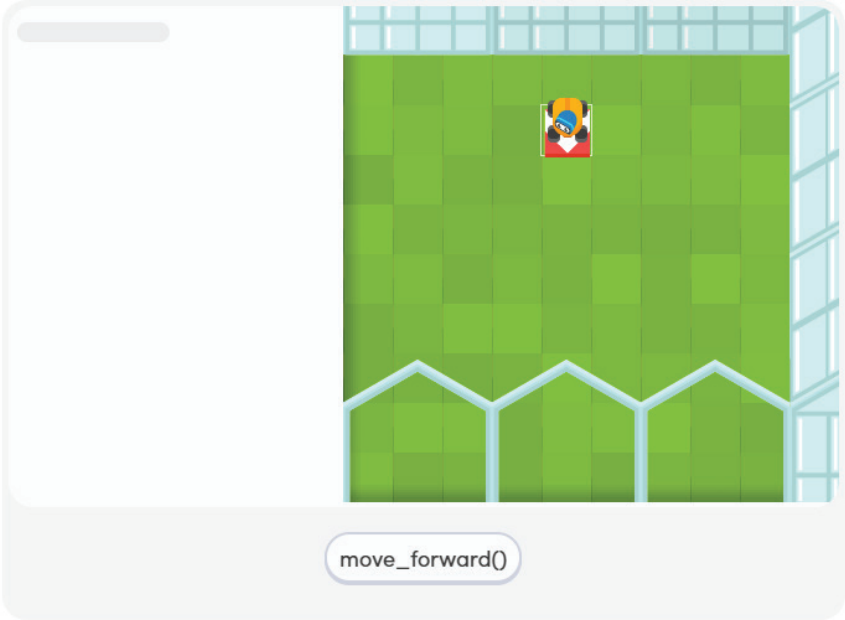
Defines the relevant **key word**

Command: An instruction that tells the computer to perform a certain action.

1. Click on the block below to add the `move_forward()` command to your code.
2. Press the 'Run' button to run the code. Check that the Farmbot follows your instructions.

Lists the **steps** you need to follow.

This is where your **code** goes. This may be code you type yourself, or it may be code you select from the bottom. Read your task carefully to understand which you are being asked to do.



Watch your **farmbot** to see if your instructions work.

Click **run** to test your program and see if it works.

Click **solution** to see what the correct answer is.

Solution

ctrl + enter to run

Run

Click **next** to move to the next task.

Next

Respectful Relationships: What is Abuse?

Year 9 Spring 1

Big Idea: Care
How do I keep myself safe?

What is Appropriate Online Conduct?	What are the Types of Abuse?	What are the Signs of Abuse?	What is Consent?	How do we Stop Abuse?	What is Abuse?
Key learning points - Online conduct should be safe and respectful - Being anonymous means to conceal your identity in order to stay safe - Some people behave negatively while being anonymous to get away with it	**Key learning points** - The five key types of abuse are physical, sexual, economic, emotional and psychological - Abuse can fall into more than one category	**Key learning points** - Physical signs of abuse include cuts and bruises - Emotional signs of abuse include mood swings and sadness - Social signs of abuse include spending less time with friends and more with the abuser	**Key learning points** - Consent is permission or agreement to do something - It can be given and withdrawn - In relationships, it should be free, reciprocal, informed, enthusiastic and specific	**Key learning points** - Gaslighting is a common method of abuse where the abuser tries to undermine the victim's sense of what's real - Abuse should always be challenged and abusers should suffer the consequences	**Key learning points** - Abuse is more common than people realise and takes many different forms - We should be on the lookout for the signs of each type of abuse and get help if we believe it is happening
conduct	**abusive**	coercion	**consent**	gaslighting	trauma

Lifeology

Lifeology | Respectful Relationships: What is Abuse? | Topic Dictionary

Image	Word*	Definition	In a sentence . . .
	conduct	The way someone behaves.	St Mark's Academy expects you to have excellent **conduct** at all times.
	**abusive**	Behaving in a cruel or violent way towards other people.	The footballer was suspended from his team for leaving the pitch early and shouting **abusive** language at the referee.
	coercion	Persuading someone forcefully to do something they do not want to do.	Bullies often use **coercion** to get their way by threatening people with physical violence.
	**consent**	To give permission for something to happen.	I gave **consent** to the student leaving the classroom when they showed me their medical pass.
	gaslighting	Trying to undermine someone's ability to determine what's real or true.	If it works, **gaslighting** can be extremely damaging for the victim because they don't know what's real anymore.
	trauma	A physical or mental wound that takes a long time to heal, and sometimes never does.	People can suffer **trauma** in their childhood and carry it with them for the rest of their lives.

Key Lifeology words are in **bold*

Skills Guide: Lifeology Assessments

This is your chance to show off **as much of your knowledge as possible** from the **last five lessons**.

1. When the teacher instructs you, use **10 minutes** to **fill in the planning worksheet**. This is your chance to **look back through your book** and gather all the right answers. The sheet is for you to refer to during your assessment, so you don't need to use full sentences. The work only has to make sense to you! Look back at your **last assessment** and check the feedback here!

1. Complete the **assessment**. You will have **15 minutes** to produce a **piece of writing** to answer the question you've been studying for the last five weeks. Write like you're in an English lesson - **full sentences, proper spelling and grammar**, and **paragraphs**. Make sure to mention **as much as you can** from your **planning sheet**. The order you mention it in doesn't matter, **so long as it's all there**.

1. Use a **green pen** to **self-assess** your work. Compare the **assessment** you just did with the **success criteria** on the **feedback sheet**. Remember to **tick your work** wherever you're awarding a mark!

As a Year 9 Lifeology Student, I know...

By the end of Spring 1

1. To stay safe online, we should avoid putting our personal information out in a public forum. ☐

2. Abuse can fall into any number of categories, including physical, sexual, economic, emotional and psychological. ☐

3. There are many different signs of abuse to be aware of, which can vary between the different types of abuse. ☐

4. Consent is permission or agreement to do something, and can be given or withdrawn at any time. ☐

5. Gaslighting is a form of abuse in which the abuser tries to undermine the victim's sense of what is real. ☐

6. Abuse is far more common than we may realise, so it's important to be aware of the signs and how we can help. ☐

Growing up in Merton: What Risks are there in the Community?

Year 9 Spring 2

Big Idea: Character
How do I grow as a person?

What Risks do we Face?	What are the Risks of Gang Violence?	What are County Lines?	What is Grooming?	What is FGM?	What Risks are there in the Community?
Key learning points - A risk is a chance that something can go wrong - When you take a risk, you know what might happen, but when you are at risk you do not have control - Risk is natural but can have dangerous consequences	**Key learning points** - People join gangs for a sense of belonging and security - But people in gangs are at a higher risk of spending time in prison or being physically harmed - Gangs take advantage of young people to recruit them	**Key learning points** - County lines refers to when gangs expand into smaller communities so they can sell drugs for more money - They often use vulnerable younger people as drug carriers when they do this	**Key learning points** - Grooming is when someone gets another person to trust them so they can take advantage of them - Gangs use grooming methods, and so do sexual predators - Common signs of grooming are money, compliments and gifts	**Key learning points** - Female genital mutilation is the removal of all or some of the external female genitals for no medical reason - In the UK it is a crime to carry it out, or to help it be carried out - You must call the police if you suspect it	**Key learning points** - Key risks in our community are gang violence, county lines, grooming and FGM - If you suspect you or anyone you know is at risk of any of these, you must inform the appropriate authorities, including the police
risk 	belonging 	vulnerable 	**grooming** 	FGM 	manipulate 

Lifeology | Growing up in Merton: What Risks are there in the Community? | Topic Dictionary

Image	Word*	Definition	In a sentence . . .
	**risk**	Something that can go wrong.	Not completing your homework on time means taking a **risk** that you'll get a detention!
	belonging	A feeling that you are a part of something that's bigger than just you.	Supporting a football team is a common way for people to get a feeling of **belonging** in their lives.
	vulnerable	More easy to harm or control than the average person.	Every time you tell someone a secret, you become more **vulnerable** to that secret getting out.
	**grooming**	The process of getting someone to trust you, so you can take advantage of them.	The problem is that people can be tricked or manipulated into doing bad things through **grooming**.
	FGM	An operation where the external female genitals are deliberately cut, injured or changed with no medical reason.	We should all be aware of the warning signs that someone we know is at risk of **FGM**, or has had it done to them already.
	manipulate	To control someone's actions or emotions for your own gain.	Abusers will often try to **manipulate** young people to get them to take part in illegal activity.

Key Lifeology words are in **bold*

Skills Guide: Lifeology Assessments

This is your chance to show off **as much of your knowledge as possible** from the **last five lessons**.

1. When the teacher instructs you, use **10 minutes** to **fill in the planning worksheet**. This is your chance to **look back through your book** and gather all the right answers. The sheet is for you to refer to during your assessment, so you don't need to use full sentences. The work only has to make sense to you! Look back at your **last assessment** and check the feedback here!

1. Complete the **assessment**. You will have **15 minutes** to produce a **piece of writing** to answer the question you've been studying for the last five weeks. Write like you're in an English lesson - **full sentences, proper spelling and grammar**, and **paragraphs**. Make sure to mention **as much as you can** from your **planning sheet**. The order you mention it in doesn't matter, **so long as it's all there**.

1. Use a **green pen** to **self-assess** your work. Compare the **assessment** you just did with the **success criteria** on the **feedback sheet**. Remember to **tick your work** wherever you're awarding a mark!

As a Year 9 Lifeology Student, I know...

By the end of Spring 2

1. A risk is a chance that something might go wrong, and although risk is natural, it can have dangerous consequences. ☐

2. People join gangs to feel a sense of belonging, but face a higher risk of physical harm and time in prison. ☐

3. County Lines refers to when gangs expand into smaller communities, often exploiting young people to do so. ☐

4. Grooming is when someone gets another person to trust them so they can take advantage of them. ☐

5. Female genital mutilation is illegal, and we should call the police if we suspect that someone has been a victim of it. ☐

6. We need to understand what the key risks in our community are, so that we can work together in order to combat them. ☐

Y9 Spring Term 1: Block 1 – Numbers

Previous Block: Construction and Congruency

Next Block: Percentages

(1)I can recognise integers, real and rational numbers.

Integers, real and rational numbers

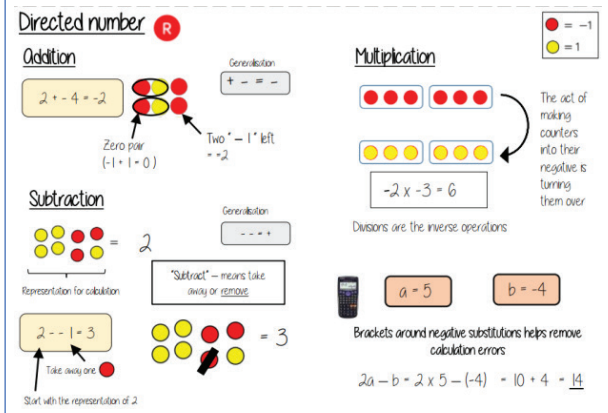
Rational – root word: ratio

Real numbers: $\frac{2}{3}$ stems from 2:1 ($\frac{2}{3}$ of the whole)

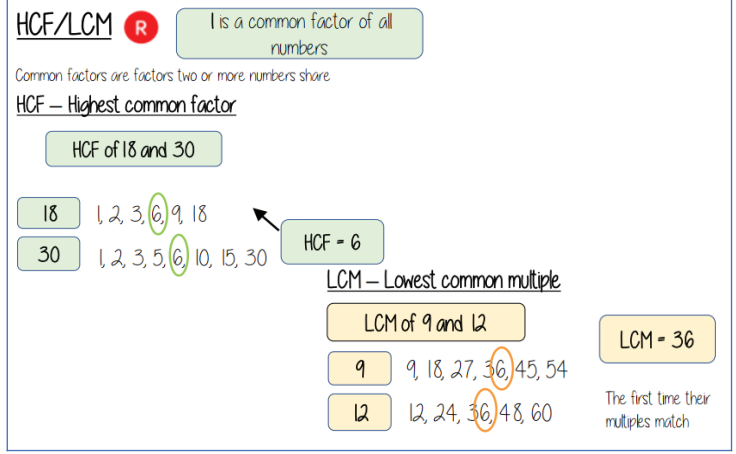
Irrational numbers: $\sqrt{2}$ the solution is a decimal that never ends and does not repeat.

The square root of a negative is not a real number and cannot be found.

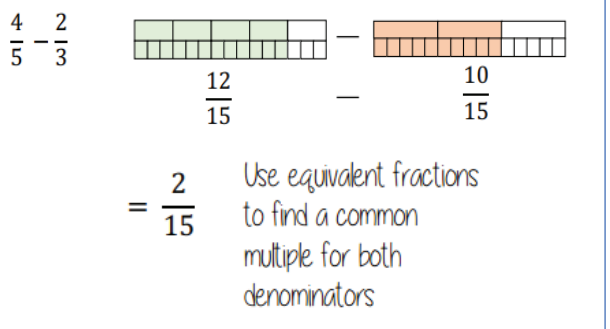
(2) I can use directed numbers.



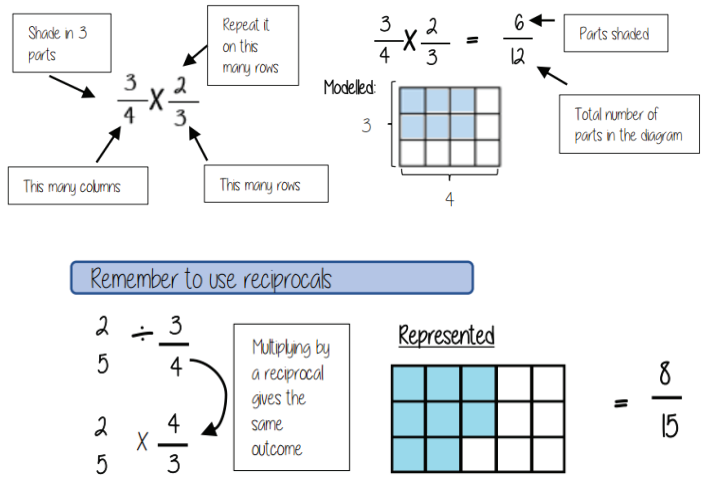
(3) I can find HCF and LCM



(4) I can use add and subtract fractions.



(5) I can multiply and divide fractions



(6) I can use standard form.

Any number between 1 and less than 10 → $A \times 10^n$ ← Any integer

$6 \times 10^5 + 8 \times 10^5$

$= 600000 + 800000$

$= 1400000$

$= 1.4 \times 10^5$

$(1.5 \times 10^5) \div (0.3 \times 10^3)$

$1.5 \div 0.3 \times 10^5 \div 10^3$

$= 5 \times 10^2$

Maths | Numbers | Topic Dictionary

Key Word	Definition	In a sentence
factor	A positive integer that divides exactly into another positive integer.	The number 3 is a **factor** of 15 because it divides evenly into 15.
integer	A whole number.	An **integer** can be a positive number, a negative number, or zero, but it cannot be a fraction or decimal.
irrational number	A number that cannot be made by dividing two integers.	The square root of 2 is an **irrational number** because it cannot be expressed as a simple fraction.
multiple	The result of multiplying a number by a positive integer.	The number 24 is a **multiple** of 6 because it can be obtained by multiplying 6 by 4.
surd	A root that cannot be written as an integer.	The cube root of 7 is a **surd** because it cannot be simplified into a rational number.
rational number	A number that can be made by dividing two integers.	The number 8 is a **rational number** because it can be expressed as a ratio of two integers.
real number	All positive numbers including decimals and fractions.	Every point on the number line represents a **real number**, whether it is positive, negative or zero.

Maths | Numbers | Skills Guide

Work out 196 × 5

$$\begin{array}{r} 196 \\ \times \quad 5 \\ \hline 980 \\ \hline 4 \quad 3 \end{array}$$

Calculate $\frac{5}{9} + \frac{1}{3}$

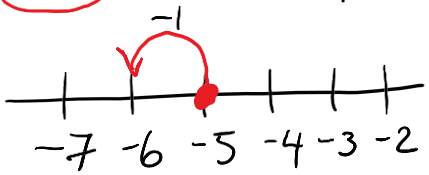
$\frac{5}{9} + \frac{1}{3}$ ($\times 3$ on $\frac{1}{3}$) ← convert to common denominator

$$\frac{5}{9} + \frac{3}{9} = \frac{5+3}{9} = \frac{8}{9}$$

↑ Now they are equivalent, we can add

Work out the following.

$-5 + -1 = -5 - 1 = -6$



$2 - -7 = 2 + 7 = 9$

++ = +
−− = +
+− = −
−+ = −

Eva has 4 m of ribbon for wrapping gifts.
She needs $\frac{2}{3}$ m for each gift.
How many gifts can Eva wrap?

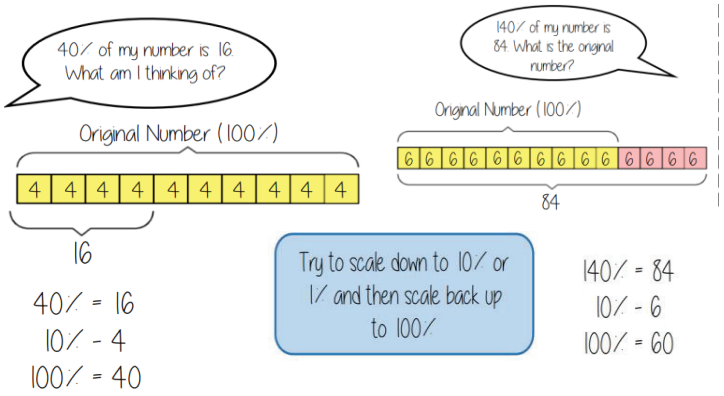
$4 \div \frac{2}{3} = 4 \times \frac{3}{2} = \frac{12}{2} = 6$

K C F
Keep Change Flip

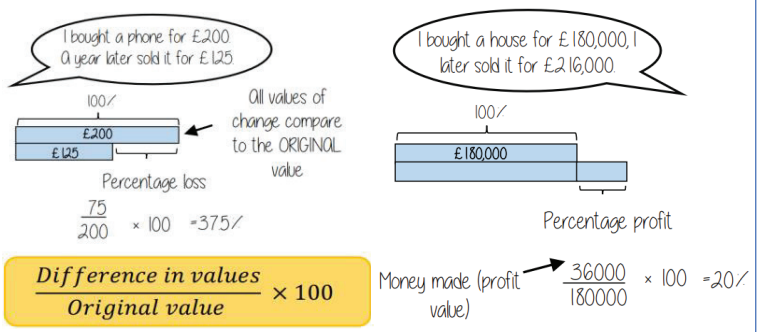
Y9 Spring Term 1: Block 2 – Percentages

Previous Block: Numbers

(5) I understand reverse percentage

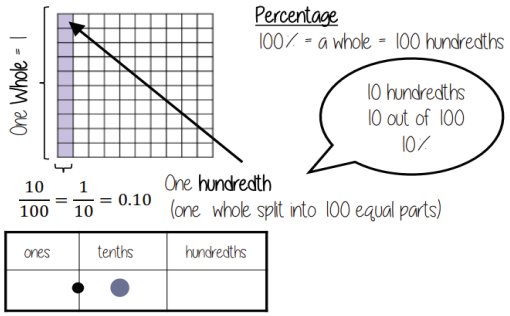


(4) I understand percentage change.

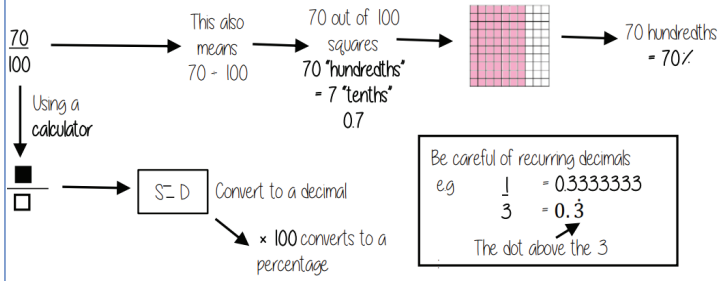


Next Block: Maths and Money

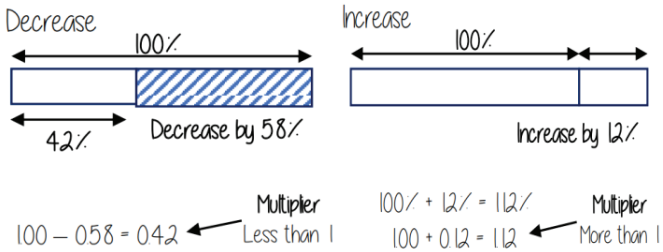
(1) I can use FDP equivalence



(2) I can convert FDP



(3) I understand percentage increase and decrease



Maths | Percentages | Topic Dictionary

Key Word	Definition	In a sentence
equivalent	Numbers or expressions that are written differently but are always equal in value.	The expressions 6(x+2) and 6x+12 are **equivalent**, as they simplify to the same result.
growth	To increase or to grow.	The population of the city experienced rapid **growth**, increasing from 50,000 to 75,000 inhabitants in just five years.
invest	To use money with the goal of it increasing in value over time (usually in a bank).	She decided to invest £500 in **stocks** to grow her savings.
loss	If a product is sold at a price less than its cost price, then the seller makes a loss.	The business suffered a **loss** of £2000 due to unexpected expenses.
multiplier	The number you are multiplying by.	The **multiplier** of 3 increased the original number,4, to 12.
percent	Parts per 100.	The shirt was on sale for 20 **percent** off the original price, making it a bargain.
profit	Profit is the money earned when selling something for more than it cost.	The company reported a **profit** of £150,000 last quarter, exceeding their expectations and boosting investor confidence.

Maths | Percentages | Skills Guide

Write $\frac{3}{4}$ as a percentage.

per 100

$\frac{3}{4} \xrightarrow{\times 25} \frac{75}{100}$

$\frac{75}{100} = 75\%$

Huan's wage is £10.40 per hour
He receives a 10% pay rise.
What is his new hourly wage?

10% of £10.40 :

10.4 ÷ 10 = 1.04

£10.40 + £1.04 = £11.44

Rosie jumps 32 cm in the air.
Annie jumps 8% higher than Rosie.
How high does Annie jump?

8% higher — multiplier — 100% + 8% = 108%

108 ÷ 100 = 1.08

32 × 1.08 = 34.56 cm

The cost of a laptop increased by 25% between 2015 and 2019
In 2019, the laptop cost £1000
How much did the laptop cost in 2015?

100% + 25% = 125%

125 ÷ 100 = 1.25

original × multiplier = new

original × 1.25 = 1000 ← rearrange

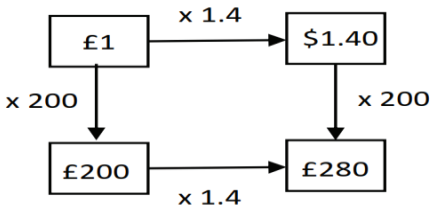
original = $\frac{1000}{1.25}$ = 800

inverse of multiply is divide

Y9 Spring Term 1: Block 3 – Maths and Money

Previous Block: Percentages

(7) I can use exchange rates.



When making estimates it is also useful to use estimates to check if our solution is reasonable.

Use inverse operations to reverse the exchange process

Common Currencies		
United Kingdom	£	Pounds
United States of America	$	Dollars
Europe	€	Euros

Next Block: Deduction

(6) I understand unit pricing.

4 Oranges	5 cupcakes
£1	£1.20

$4 = £1.00 \div 2$
$2 = £0.50 \div 2$
$1 = £0.25$ — Cost per Unit

$5 = £1.20 \div 5$
$1 = £0.20$

To calculate unit per cost you divide by the cost.

Cupcakes are the best value as one item has the cheapest value

There is a directly proportional relationship between the cost and number of units.

(5) I understand wages and taxes

Wages and Taxes

Salaries fall into tax brackets – which means they pay this much each month from their salary.

Taxable Income	Tax Rate
£12 501 to £50 000	20%
£50 001 to £150 000	40%
over £150 000	45%

Over time:
Time and a half – means 1.5 times their hourly rate
Double – 2 times their hourly rate

(4) I understand Value Added Tax (VAT).

VAT is payable to the government by a business. In the UK VAT is 20% and added to items that are bought.

Essential items such as food do not include VAT.

(1) I understand bills and bank statements

Bills – tell you the amount items cost and can show how much money you need to pay.
Some can include a total
Look for different units (Is it in pence or pounds)

Menu	Price
Milk	89p
Tea	£1.50

Bank Statements

Bank statement can have negative balances if the money spent is higher than the money coming into the account

Date	Description	Credit	Debit	Balance
1st Sept	Salary	£1500		£1500
8th Sept	Mortgage		£600	£900
25th Sept	Baby Money	£15		£915

(2) I understand simple interest

For each year of investment the interest remains the same

$$\frac{\text{Principal amount} \times \text{Interest Rate} \times \text{Years}}{100}$$

Principal amount is the amount invested in the account

e.g. Invest £100 at 30% simple interest for 4 years

$\frac{100 \times 30 \times 4}{100} = £120$

This account earned **£120** interest.
At the end of year 4 they have **£220**

(3) I understand compound interest

Interest is added to the current value of investment at the end of each year so the next year's interest is greater.

$$\text{Principal amount} \times \text{Multiplier}^{\text{Years}}$$

e.g. Invest £100 at 30% compound interest for 4 years

$100 \times 1.3^4 = £285.61$

This account has **£285.61** in total at the end of the 4 years.

Maths | Topic Dictionary | Maths and Money

Key Word	Definition	In a sentence
balance	An amount of money in an account.	She checked her acount **balance** and was relieved to see a balance of £1000, enough to cover her rent for the month.
bills	Shows how much money is owed for goods or services.	She paid her **bills** online, covering her electricity, water, and credit card dues with just a few clicks.
credit	An amount of money paid into an account.	The bank statement showed a **credit** of £500, which was the deposit she had made the previous day.
currency	The type of money a country uses.	The traveler exchanged her money for the local **currency** at the airport, swapping dollars for euros.
debit	An amount of money taken out of an account.	The bank statement showed a **debit** of $200, which was the withdrawal he had made at the ATM last week.
deposit	An initial payment (often away of securing an item you will later pay for).	She made a **deposit** of £500 into her account.
expense	A cost or outgoing.	The new computer was a big **expense** for her small business.
per annum	Each year.	The investment earned 5% interest **per annum**.

Maths | Maths and Money | Skills Guide

In the UK, the rate of VAT is 20%
The price of a camera excluding VAT is £96
Calculate the price of the camera including VAT.

20% of £96:

10% = 96 ÷ 10 = 9.6
20% = 9.6 × 2 = 19.2

£96 + £19.2 = £115.20

Remember money is always in 2 decimal places

Scott earns £7.50 per hour.
He works 8 hours per day, 4 days per week.
How much does Scott earn in a week?

£7.50 × 8 = £60 per day

£60 × 4 = £240 per week

Scott earns £240 in a week.

Two shops sell the same pens.

Tip Top Pens	On Point Pens
£1.68 for 10	£1.98 for 12

Which shop offers better value for money?
Show working to support your answer.

Tip Top Pens:
£1.68 ÷ 10 = 0.168

On Point Pens:
£1.98 ÷ 12 = 0.165

0.165 < 0.168

Therefore, On Point Pens offer better value for money.

An account pays 4% compound interest per year.
Eric invests £1500 into the account for 2 years.
How much interest will he earn?

$A = P \times m^t$

A: Amount after interest
P: Principal amount
m: multiplier
t: time (years)

$A = 1500 \times 1.04^2 = 1622.40$

1622.40 − 1500 = £122.40

Y9 Spring Term: Block 4 – Deduction

Previous Block: Maths and Money

(6) I can make conjectures with shapes.

Keywords and facts to recall with shape

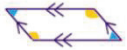
Area: the amount of space inside a shape
Perimeter: the length around a shape
Regular Polygons: All sides and angles are equal

Quadrilateral Facts

Square
All sides equal size
All angles 90°
Opposite sides are parallel

Rectangle
All angles 90°
Opposite sides are parallel

Rhombus
All sides equal size
Opposite angles are equal

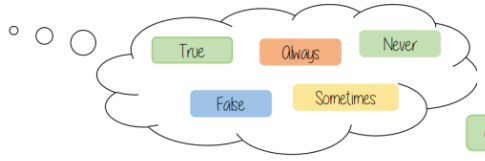


Parallelogram
Opposite sides are parallel
Opposite angles are equal
Co-interior angles

Kite
No parallel lines
Equal lengths on top sides
Equal lengths on bottom sides
One pair of equal angles

Next Block: Translations and Rotations

(5) I can make conjectures with angles



Proving a conjecture
A pattern is noticed for many cases

Disproving a conjecture
Only one counterexample is needed t disprove a conjecture

Apply the angle rules

The sum of angles in a triangle is 180°

Test the theory

$180 - 70 - 20 = 90$
$180 - 85 - 5 = 90$
$180 - 45 - 45 = 90$

Make conjecture

The angle that meets the circumference in a semi circle is 90°

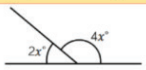
(4) I can solve angle problems

Angles on a straight Line
180°

Vertically opposite angles
Equal

Angles around a point
360 °

Link angle facts to algebra

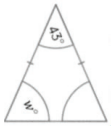


Form an equation

$2x + 4x = 180°$

State the reason

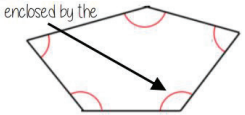
The sum of angles on a straight line is 180 °



Triangles
Sum of angles is 180 °

Isosceles have the same base angles

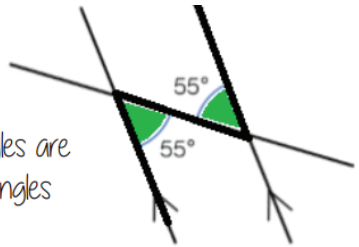
Interior Angles
The angles enclosed by the polygon



(number of sides – 2) x 180

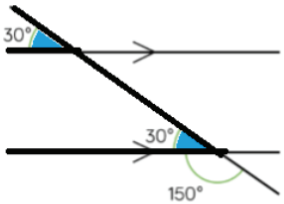
(1) I can recognise alternate angles.

Because alternate angles are equal the highlighted angles are the same size

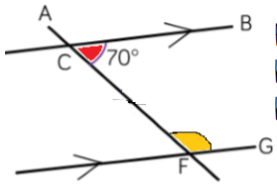


(2) I can recognise corresponding angles.

Because corresponding angles are equal the highlighted angles are the same size



(3) I can recognise co-interior angles.



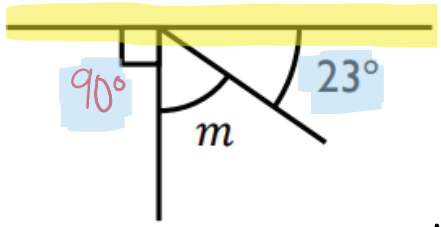
Because co-interior angles have a sum of 180° the highlighted angle is 110°

As angles on a line add up to 180° co-interior angles can also be calculated from applying alternate/ corresponding rules first

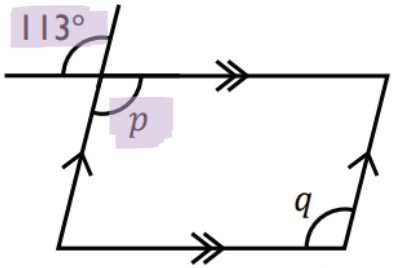
Maths | Deduction | Topic Dictionary

Key Word	Definition	In a sentence
alternate angles	A pair of angles between a pair of parallel lines on opposite sides of the transversal.	The student applied the concept of **alternate angles** to solve the geometry problem.
co-interior angles	A pair of angles between a pair of parallel lines on the same side of the transversal.	The geometry teacher explained that **co-interior angles** are supplementary, meaning they add up to 180 degrees.
conjecture	A statement that might be true but is not proven.	The mathematician **conjectured** that the number 36 could be expressed as the sum of two prime numbers.
corresponding angles	A pair of angles in matching positions compared with a transversal.	The math textbook illustrated **corresponding angles** with a diagram, highlighting their identical measures.
counterexample	An example that disproves a statement.	The student found a **counterexample** to the conjecture that all odd numbers are prime, disproving the theory with the number 9.
parallel	Two straight lines that never meet with the same gradient.	The architect designed the two roads to run **parallel** to each other.
perpendicular	Two straight lines that meet at 90 degrees.	The architect designed the building's walls to be **perpendicular** to the floor, ensuring a sturdy and stable structure.
transversal	A line that crosses at least two other lines.	The teacher drew a **transversal** line across the two parallel lines, creating eight angles in the process.

Maths | Deduction | Skills Guide



Work out the size of the angles marked with letters.
Give a reason for each answer.



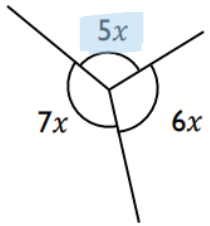
Angles on a straight line adds up to 180°.

90 + 23 = 113°

180 − 113 = 67° M = 67°

p = 113° because vertically opposite angles are equal.

q = 113° because opposite angles in a parallelogram are equal.



Explain why $18x = 360°$

Angles around a point is 360°

So, 5x + 7x + 6x = 18x = 360°

Find the size of the smallest of the 3 angles.

18x = 360

÷18 ÷18

x = 20°

5x = 5 × 20

= 100°

The angles in a triangle are $(5x - 3)°$, $(9x)°$ and $(3x + 13)°$. Show that the triangle is right-angled.

Angles in a triangle add up to 180°

5x − 3 + 9x + 3x + 13 = 180 ← collect like terms

17x + 10 = 180

−10 −10

17x = 170

÷17 ÷17

x = 10

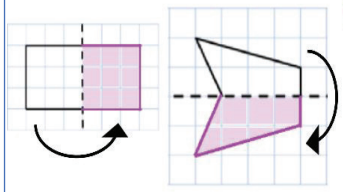
9x = 9 × 10 = 90° ⟶ right angle

Y9 Spring Term 1: Block 5 – Translations and Rotations

Previous Block: Deduction

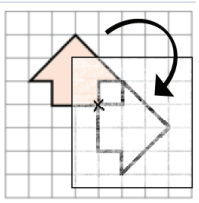
Next Block: Pythagoras' Theorem

(5) I can compare rotations and reflections.



R Reflections are a mirror image of the original shape.

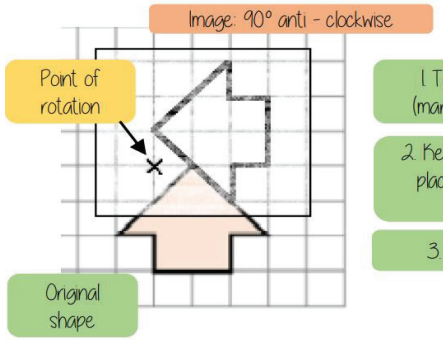
Information needed to perform a reflection:
- Line of reflection (Mirror line)



Rotations are the movement of a shape in a circular motion

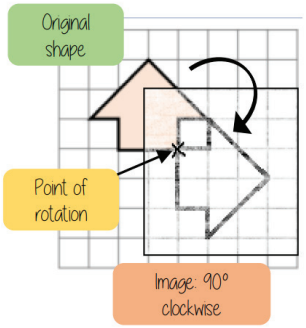
Information needed to perform a rotation:
- Point of rotation
- Direction of rotation
- Degrees of rotation

(4) I can rotate from a point outside a shape.



1. Trace the original shape (mark the point of rotation)
2. Keep the point in the same place and turn the tracing paper
3. Draw the new shape

(3) I can rotate from a point in a shape.

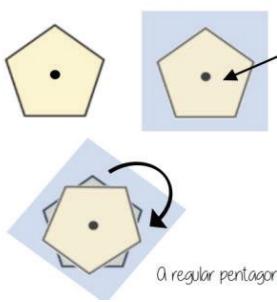


1. Trace the original shape (mark the point of rotation)
2. Keep the point in the same place and turn the tracing paper
3. Draw the new shape

(1) I understand rotational symmetry.

Rotational Symmetry

Tracing paper helps check rotational symmetry



1. Trace your shape (mark the centre point)
2. Rotate your tracing paper on top of the original through 360°
3. Count the times it fits back into itself

A regular pentagon has rotational symmetry of order 5

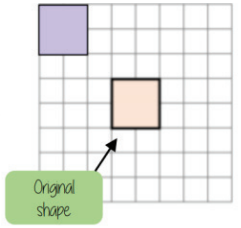
(2) I can use translation and vector notation.

Vector Notation → $\begin{pmatrix} 1 \\ -2 \end{pmatrix}$

How far left or right to move
Negative value (left)
Positive value (right)

How far up or down to move
Negative value (down)
Positive value (up)

Translation $\begin{pmatrix} -3 \\ 3 \end{pmatrix}$



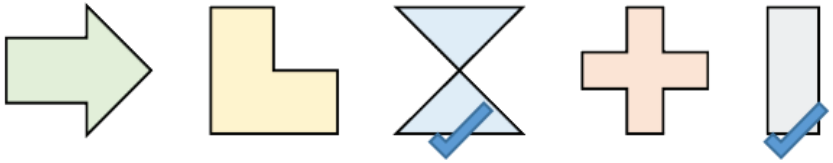
Every vertex has been translated by the same amount

Maths | Rotations and Translations | Topic Dictionary

Key Word	Definition	In a sentence
horizontal	A horizontal line runs from left to right and has a slope of zero, meaning it does not rise or fall.	The windowsill was a **horizontal** surface, perfect for placing plants.
invariant	A point that does not move after a transformation.	The scientist found that the **invariant** constant appeared in every experiment, no matter the conditions.
irregular	A shape that has unequal sides and unequal angles.	The graph showed an **irregular** curve, with sudden spikes and dips that did not fit a predictable pattern.
line of symmetry	A line that cuts a shape exactly in half.	The butterfly's wings are identical on both sides, forming a perfect **line of symmetry** down the middle.
regular	A shape that has equal sides and equal angles.	A **square** is a regular polygon because all its sides are equal.
rotational symmetry	Rotational symmetry refers to a property of a shape that looks the same after being rotated by a certain angle around a central point.	The starfish exhibits **rotational symmetry** because it looks the same after being rotated by certain angles.
vertex	A point where two or more edges meet.	The cube has eight **vertices**, each formed where three edges meet.
vertical	A vertical line runs up and down and has an undefined slope because it does not change in the horizontal direction.	The y-axis on a graph is a **vertical** line that runs from top to bottom.

Maths | Rotations and Translations | Skills Guide

Which shapes have rotational symmetry of order 2?
Tick your answers.



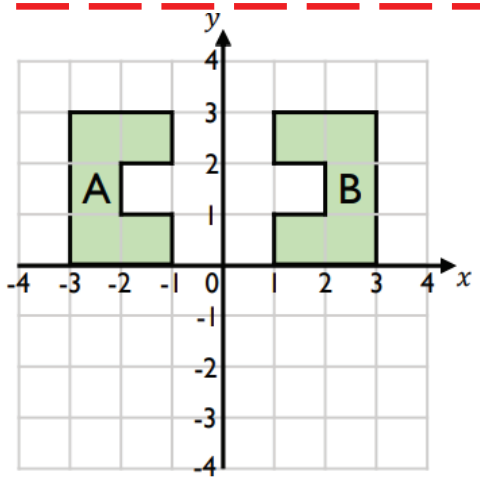
Rotational symmetry – amount of times it looks the same around a full 360° turn.

The order of rotational symmetry of a shape is equal to the number of lines of symmetry.

Draw one example that supports this conjecture, and one example to disprove this conjecture.

Support	Disprove
e.g. 	e.g. 

Describe the transformation that maps shape A onto shape B.



Reflection on the line $x = 0$ or y-axis

Reflection – shape being flipped.

The coordinates of point F after a translation by the vector $\begin{pmatrix} -4 \\ 3 \end{pmatrix}$ are (5, 8)

Find the coordinates of point F before the translation.

Vector: $\begin{pmatrix} x \\ y \end{pmatrix}$ ← positive moves right, negative moves left; ← positive moves up, negative moves down

Inverse of $\begin{pmatrix} -4 \\ 3 \end{pmatrix} = \begin{pmatrix} 4 \\ -3 \end{pmatrix}$

$5 + 4 = 9 \quad 8 - 3 = 5$

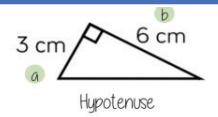
(9, 5)

Y9 Spring Term 1: Block 6 – Pythagoras' Theorem

Previous Block: Rotations & translations

Next Block: Enlargement & Similarity

(4) I can determine the value of the hypotenuse



Either of the short sides can be labelled a or b

$a^2 + b^2 =$ hypotenuse^2

1 Substitute in the values for a and b

$3^2+6^2 =$ hypotenuse^2

$9 + 36 =$ hypotenuse^2

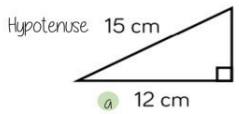
$45 =$ hypotenuse^2

2 To find the hypotenuse square root the sum of the squares of the shorter sides

$\sqrt{45} =$ hypotenuse

$6.71cm =$ hypotenuse

(5) I can determine other lengths of the right triangle



Either of the short sides can be labelled a or b

$a^2 + b^2 =$ hypotenuse^2

$12^2+b^2 = 15^2$

1 Substitute in the values you are given

$144 + b^2 = 225$

$-144 \quad -144$

Rearrange the equation by subtracting the shorter square from the hypotenuse squared

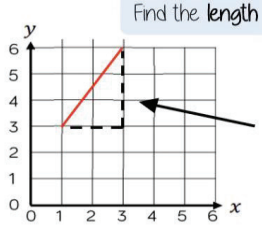
Square root to find the length of the side

$b^2 = 111$

$b = \sqrt{111} = 10.54\ cm$

(6) I can apply Pythagoras' theorem on a coordinate axis

Find the **length** of the line segment



The segment can be made into a right-angled triangle by adding the sides on the diagram

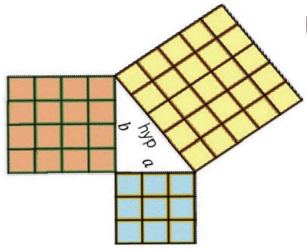
The line segment is the **hypotenuse**

$a^2 + b^2 =$ hypotenuse^2

The lengths of a and b are the sides of the triangle

Be careful to check the scale on the axes

(3) I can determine of a triangle is right angled



a = 3 b = 4 c = 5

If a triangle is right-angled, the sum of the squares of the shorter sides will equal the square of the hypotenuse.

$a^2 + b^2 =$ hypotenuse^2

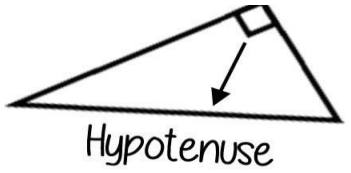
eg $a^2+b^2 =$ hypotenuse^2

$3^2 + 4^2 = 5^2$

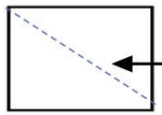
$9 + 16 = 25$

Substituting the numbers into the theorem shows that this is a right-angled triangle

(2) I can identify the hypotenuse of a right triangle



The hypotenuse is always the longest side on a triangle because it is opposite the biggest angle.



Polygons can still have a hypotenuse if it is split up into triangles and opposite a right angle

(1) I can square and square root

Squares and square roots R

This can also be written as 6^2

$\sqrt{\ }$ is the square root symbol

eg $\sqrt{64} = 8$

Because 8 × 8 = 64

1 × 1	2 × 2	3 × 3	4 × 4	5 × 5	6 × 6	7 × 7	8 × 8	9 × 9	10 × 10
1	4	9	16	25	36	49	64	81	100

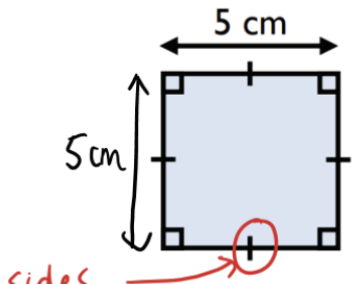
Square numbers

Maths | Pythagoras' Theorem | Topic Dictionary

Key Word	Definition	In a sentence
square Number	The result of multiplying a number by itself.	The number 16 is a **square number** because it equals 4×4
square Root	A number that, when multiplied by itself, gives the original value.	The **square root** of 25 is 5 because $5 \times 5 = 25$.
hypotenuse	The longest side of a right-angled triangle, opposite the right angle.	In a right triangle with sides 3 and 4, the **hypotenuse** is 5 according to the Pythagorean theorem.
opposite	The side of a triangle directly across from the angle being measured.	In a triangle, if the angle of interest is 30°, the side **opposite** that angle is the shortest one.
adjacent	The side of a triangle that is next to the angle being measured, excluding the hypotenuse.	To find the cosine of 45°, divide the length of the **adjacent** side by the length of the hypotenuse.
right Triangle	A triangle that has one angle exactly equal to 90 degrees.	In a **right triangle**, the sum of the squares of the two shorter sides equals the square of the hypotenuse.
Pythagorean theorem	A mathematical formula stating that in a right triangle $a^2+b^2 = c^2$ where c is the hypotenuse.	Using the **Pythagorean theorem**, if one side is 3 and the other is 4, the hypotenuse is 5 because $3^2 + 4 = 5^2$.
acute Angle	An angle smaller than 90 degrees.	In a right triangle, both non-right angles are **acute angles.**

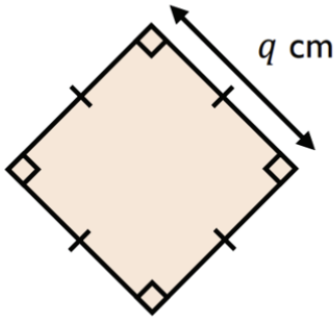
Maths | Pythagoras' Theorem | Skills Guide

Work out the values of p and q.



sides are equal

Area = p cm²

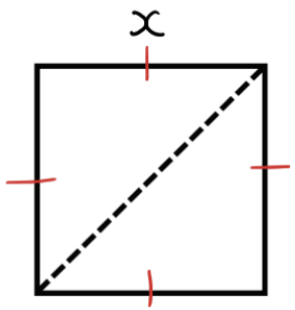


Area = 64 cm²

$p = 5 \times 5$
$= 25\text{cm}^2$

$q = \sqrt{64}$
$= 8\text{ cm}$

The perimeter of the square is 36 m.
Work out the length of its diagonal.



Perimeter $= x+x+x+x$
$36 = 4x$
$\div 4 \quad \div 4$
$9 = x$

$a^2+b^2=c^2$
$9^2+9^2=c^2$
$81+81=c^2$
$\sqrt{162}=c$
$c = 12.72792206 \approx 12.7\text{cm}$

A triangle has sides of length 48 mm, 5 cm and 1.4 cm.
Is the triangle right-angled?
Show working to justify your answer.

↳ convert to cm

$48\text{mm} = 4.8\text{cm}$
$a^2+b^2=c^2$ works for right-angled triangles
$1.4^2+4.8^2=5^2$
$25 = 25$ they are equal so it is a right angle triangle.

The point P has coordinates (5, 7)
The point Q has coordinates (−1, −1)
Find the length of the line segment PQ.

Rough sketch:

Base: Compare x co-ordinates
$5 - -1 = 6$

Height: Compare y co-ordinates
$7 - -1 = 8$

$a^2+b^2=c^2$
$6^2+8^2 = 36+64 = 100$
$\sqrt{100} = 10$ Length PQ = 10

PE | Physical training | Topic Dictionary

Key word	Definition	Question
obesity	A person with a large amount of body fat	What type of athlete would need a high amount of **strength** to compete?
cardiovascular endurance	The ability of the heart, lungs and blood to transport oxygen during sustained exercise	What type of athlete would need good **cardiovascular endurance** to compete?
flexibility	The range of movement possible at a joint	What type of athlete would need good **flexibility** to compete?
coordination	The ability to use 2 or more body parts at the same time whilst maintaining control	What type of athlete would need good **coordination** to compete?
balance	The ability to maintain your centre of mass over a base of support	What type of athlete would need good **balance** to compete?
agility	The ability to change direction quicky whilst maintaining control	What type of athlete would need good **agility** to compete?
speed	The time taken to overcome a distance	What type of athlete would need good **speed** to compete?

Physical training Knowledge Organiser

Phases of a warmup:
1. Pulse raiser
2. Dynamic stretches
3. Sport specific/game related activity

Phases of a cooldown:
1. Gradual reduction in intensity
2. Stretching

As a year 9 sports person, I should….

1. Know the different components of fitness	
2. Understand the importance certain components of fitness for different positions	
3. Know the difference muscular endurance and muscular strength	
4. Know the name of the fitness tests that test the components	

Key Word	Definition	Example
Cardiovascular endurance	The ability of the heart, lungs and blood to transport oxygen	Completing a full game of basketball or football
Flexibility	The range of motion at a joint	A football player and basketball player would use this to increase their stride length
Muscular endurance	The ability to use voluntary muscles repeatedly without tiring	Basketball player and footballer would repeatedly use their legs to run, shoot and jump
Muscular strength	The amount of force a muscle can exert against a resistance	A footballer kicking a football into the goal, they would need to use muscles to get enough power to beat the goalkeeper
Agility	The ability to change direction quickly whilst maintaining control	Basketballer will need agility to change directions quickly when getting past his opponents
Balance	The ability to maintain the body's centre of mass above the base of support	Footballers will be pushed off the ball while trying to dribble past their opponents. They will need balance to stay on the ball using their body's centre of mass
Coordination	The ability to use two or more body parts together	Basketballers will need to use their eyes and hand to keep the ball In their possession while dribbling

Football Knowledge Organiser

Infringement	Description	Linesman signal
Thrown ins	When the ball goes out of play on the touch line, the team who didn't touch it last are awarded the ball and restart play with a throw in	
subs	When one player is swapped for another, usually because of an injury or tactical reasons	
Offside	A player is in an offside position if they are nearer to their opponents' goal line than both the ball and the second last opponent when the ball is played towards them	

As a year 9 sports person, I should....

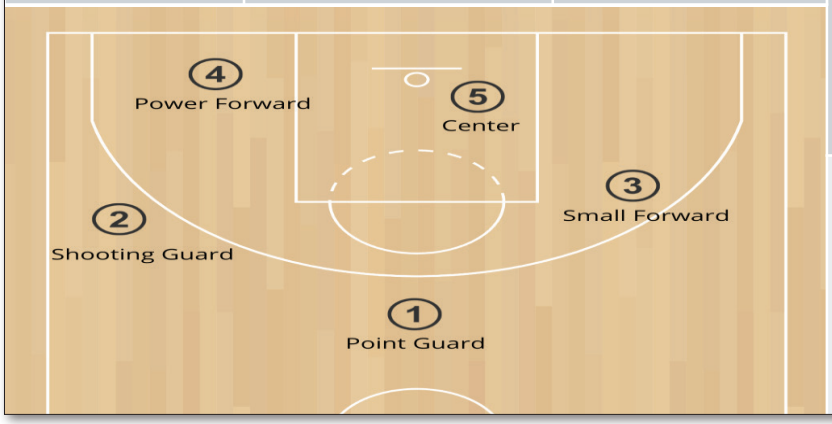
1. Know all the different positions used in the game of football	
2. Understand the responsibility of each role in football	
3. Know the rules of the game	
4. Be able to explain different skills used in the game and show it in competitive situations	

Positions

goalkeeper	**Main role is to stop the opposition from scoring goals. They are the only players who are allowed to use their hands on the pitch**
Defender	Main responsibility is to stop the opposition attacking their goal. Can be useful at set pieces as they are usually the tallest players on the pitch
Midfielder	Needs to be good at all areas of the game as they are involved in attacking and defensive situations
Forward	Main role is attacking the opposition's goal and scoring goals

basketball Knowledge Organiser

infringement	Description	Hand signals
Back court violation	Once the basketball crosses the centre line and into the offensive zone, it's a violation for the offense to dribble or pass it into the backcourt	
Point scored	The referee fingers to indicate how many points have been scored (1, 2 or 3)	
3 second violation	a player shall not remain in the opponents' key for more than three consecutive seconds while their team is in control the ball	



As a year 9 sports person, I should....

1. Know all the different positions used in a basketball game	
2. Understand the difference between a half court and full court press	
3. Know the different hand signals for infringements in the game	
4. Be able to use different type of dribbling skills in a competitive game	

Positions

Guard	**Point guards have strong ball handling and passing skills and are typically used to run the offense. Shooting guards, as the name implies, are generally the team's best shooters**
Centre	**The centre (C), usually plays near the baseline, close to the basket (the "low post"). They are usually the tallest players on the floor. They are typically skilled at gathering rebounds, contesting shots and setting screens on plays**
Forward	**Forwards are primarily responsible for scoring and rebounding**

Skills Guide

DEFINE	**I am able to**: • Define 4 key words from my dictionary, such as: • Speed • Agility • Balance • Co-ordination
APPLY	**I am able to**: • Give examples of which position in football and basketball needs a specific fitness component to benefit their game • Describe how you would test for different components of fitness • Describe how some athletes would not need to focus on training some components of fitness
EVALUATE	• **I am able to**: • Explain why a footballer or basketballer would need certain fitness components more than other fitness components . • Explain how footballers and basketballers would be able to improve certain components of fitness by using certain training methods

RE| St Mark's Gospel|Topic Dictionary

Image	Key Word	Definition	In a sentence
	**Baptism**	A Christian ceremony, used to wash sins away and the beginning of a person's relationship with God	The baby cried as the priest performed the **baptism**, pouring water over her head.
	**Conviction**	Decision of a jury a judge in a court of law that someone is guilty of a criminal offence	Jesus was wrongfully **convicted** of starting a rebellion against the Romans.
	**Crucifixion**	The event where Jesus was put to death by being nailed to a cross.	The **crucifixion** of Jesus is celebrated by Christians on Good Friday during Holy Week.
	**Discipleship**	Being a follower or a student of someone. Jesus had 12 disciples during his ministry, today all Christians are disciples.	Modern day **discipleship** includes being a role model for other Christians and evangelising about the faith.
	**Evangelism**	Spreading the word of God through action or speech	There are many forms of **evangelism** but being a street preacher has always been a popular one.
	**Interpretation**	A way of reading. Looking for specific types of knowledge in a piece of writing.	**Interpretation** of scripture can vary greatly as some are fundamentalists and some are liberal.
	**Gospel**	Greek for 'Good News'. The story of Jesus' life.	The **gospel** shares the life of Jesus from his birth to ascension.
	**Literal Meaning**	A word-for-word way of reading. Believing that the Bible contains historical, scientific and spiritual truths.	A fundamentalist reads the Bible **literally** and believes God created the world in 6 days.
	**Ministry**	The name given to the three years that Jesus spent preaching and performing miracles, including his teachings and parables	Jesus' **ministry** began when he was baptised at the age of 30.
	**Miracle**	An extraordinary event taken as a sign of the power of God	Everyone thought it was a **miracle** when it snowed in the desert.
	**Outcast**	People who are not accepted by society; a person who has been rejected	Jesus chose to spend his time with **outcasts** like those with leprosy to show that God is truly all-loving.
	**Parable**	A simple story used to illustrate a moral or spiritual lesson, as told by Jesus in the Gospels.	Jesus often taught his followers through parables **such as the Parable of the Prodigal Son.**
	**Sanhedrin**	Jewish Council at the time of Jesus: It consisted of 71 members, met in Jerusalem and was led by the High Priest	The **Sanhedrin** held a lot of authority in Jerusalem at the time of Jesus.
	**Spiritual Meaning**	A way of reading that believes some stories in the Bible are metaphors. Believing that a text contains spiritual truths but may not be completely accurate.	A liberal approach seeks **spiritual meanings** and believes God created the world by causing the Big Bang.

As a Year 8 theologian I can interpret St Mark's Gospel

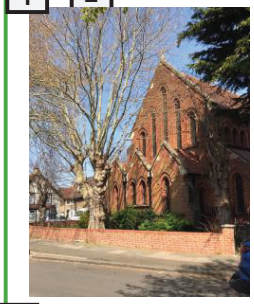
As a Year 8 RE student I know …	
Why we study St Mark's Gospel	1
The influence of St Mark on our local community	2
The history of the Gospel	3
The chronology of the gospel	4

1

Who was St Mark?

Referred to as John Mark, he was first introduced in Acts 12 as the companion of Paul and Barnabas on their apostolic missions. He worked alongside these two faithful Christians to spread the Gospel across the nations.
Martyred for the Christian faith Mark is represented as a lion in our school logo because of his commitment to evangelism (spreading the Christian faith).

1 2



St Mark Church, Mitcham

Our school's local church also named after St Mark is a diverse and welcoming Church of England church, in the diocese of Southwark.

3

History of St Mark's Gospel

The Gospel of Mark is the shortest of the four Gospels. Ninety-percent of its stories are found in either Matthew or Luke. The early church father, Augustine, considered Mark to be a mere abbreviation of Matthew and Luke.
However, in recent years the Gospel of Mark has become more widely studied due to the belief it was the first of the gospels to be written down (it was written in approx. 70AD).

The first half of the Gospel concerns the identity of Jesus as the mighty Messiah and Son of God (Mark 1:1–8:30). The second half concerns the mission of Jesus (Mark 8:31–16:8). According to the Gospel Jesus incarnated to suffer and die as an atoning sacrifice for sins.

Strictly speaking, though all four Gospels are anonymous, early church tradition identified the author of the second Gospel as John Mark, cousin of Barnabas (Col 4:10) and son of Mary, a prominent woman in the church in Jerusalem (Acts 12:12).

4

Key Events in St Mark's Gospel

Jesus' Baptism – Mark 1:9-11
Jesus is baptized by John in the Jordan River, and the Holy Spirit descends on Him like a dove.

Jesus and the Four Fishermen – Mark 1:16-20
Jesus calls Simon (Peter), Andrew, James, and John to follow Him and become "fishers of men."

Crowd by the Lake – Mark 2:13-17
Jesus teaches by the lake and calls Levi (Matthew) to follow Him, leading to criticism from the Pharisees.

Parable of the Sower – Mark 4:1-9
Jesus teaches the crowds a parable about a sower scattering seeds, explaining how different people respond to the word of God.

Death of John the Baptist – Mark 6:17-29
John the Baptist is imprisoned and beheaded by King Herod, following the request of Herodias' daughter.

Parable of the Tenants – Mark 12:1-12
Jesus tells a parable about a landowner and his tenants, symbolizing Israel's rejection of God's messengers.

Jesus Predicts Peter's Denial – Mark 14:27-31
Jesus predicts that Peter will deny Him three times before the rooster crows.)Peter's Denial – Mark 14:66-72(Peter denies knowing Jesus three times, just as Jesus predicted, and the rooster crows.

Jesus' Crucifixion – Mark 15:21-41
Jesus is sentenced to death, crucified, and dies on the cross.

Resurrection and Appearance to Mary Magdalene – Mark 16:9-11
Jesus appears first to Mary Magdalene after His resurrection and she tells His disciples, but they don't believe her.

Skills – Biblical Literacy

What are we looking for?	When reading, ask yourself:
Literary Form	*How is this story written?* *Does the story have a specific genre?* *What meaning can we get from this story?*
Author and Audience	*Who was the text written by?* *Why did the author write this story?* *Who was it written for?*
Setting	*What is the world this story is set in?* *What places, roles, people and customs are mentioned?*
Meaning	*What do you think the author is trying to say with this story?* *What is this story about: morals, humanity, religion, God?*
Our World Today	*What can this story teach us about our world today?*

John the Baptist prepares people for Jesus.

1 The beginning of the good news about Jesus the Messiah,[a] the
Son of God,[b] 2 as it is written in Isaiah the prophet:

"I will send my messenger ahead of you,
who will prepare your way"[c]—
3 "a voice of one calling in the wilderness,
'Prepare the way for the Lord,
make straight paths for him.'"[d]

4 And so John the Baptist appeared in the wilderness, preaching a
baptism of repentance for the forgiveness of sins. 5 The whole
Judean countryside and all the people of Jerusalem went out to him.
Confessing their sins, they were baptized by him in the Jordan River.
6 John wore clothing made of camel's hair, with a leather belt around
his waist, and he ate locusts and wild honey. 7 And this was his
message: "After me comes the one more powerful than I, the straps
of whose sandals I am not worthy to stoop down and untie. 8 I
baptize you with[e] water, but he will baptize you with[f] the Holy
Spirit."

Gives hope to believers.

Quote from the Old Testament Prophet (someone who hears from God), Isaiah.

John was an 'Essene'. A group which believed Baptism was very important

Third part of the Trinity. Meaning believers would be filled with the power of God themselves.

What are we looking for?	
Literary Form	*The first half of the Gospel concerns the identity of Jesus as the mighty Messiah and Son of God (Mark 1:1–8:30).*
Author and Audience	*This very short Gospel concentrates on the last week before Jesus died. It shows how Jesus accepted suffering and won final victory over death and evil. Its main purpose was to encourage the Church in Rome which was suffering persecution.*
Setting	*Unlike Matthew and Luke, Mark tells us nothing about Jesus' birth or childhood, instead, Mark plunges right into the public ministry of Jesus. The Trinity are also present during the baptism.*
Meaning	*Shows that Jesus was being publicly recognised as the one Isaiah had spoken of, his baptism sets an example to his followers, and shows approval of John and the work he was doing.*
Our World Today	*This proves to Christians that Jesus was the prophesised Messiah and that he is beginning his work of repairing the covenant between God and humanity.*

Model Answer: What is the significance of Jesus' baptism (Mark 1:1-8)?

Jesus' baptism is important because it's the start of His ministry. Even though He was perfect and didn't need to repent, He got baptized to show He was willing to stand with people who do. When He was baptized, the Holy Spirit came down like a dove, and God's voice said, "This is my Son" (Mark 1:9-11). It showed everyone that Jesus was divine and was sent by God. His baptism also set an example for us, showing that we should obey God too. Finally, it pointed to what Jesus came to do—die and rise again to save us from sin.

RE | Conflict | Topic Dictionary

Image	Key Word	Definition	In a sentence
	**Conflict**	Serious disagreement or argument between people, groups, or ideas.	A **conflict** arose when two counties disagreed over how to divide the natural resources found at their border.
	**Greed**	Going to war to gain land or natural resources such as oil.	**Greed** leads people to take more than they need, creating injustice in society.
	**Guru Granth Sahib**	The final Guru (teacher) in the Sikhi faith. The holy book of the Sikhi faith which contains guidance of how to be a good Sikh.	Sikhs read the **Guru Granth Sahib** for spiritual guidance and wisdom.
	**Holy war**	A war that is fought for religious reasons, usually backed by a religious leader.	The Crusades are an example of a **Holy War** fought by Christians in the medieval times.
	**Justice**	Bringing about what is right and fair, according to the law of God's will.	Those who fight for **justice** want to ensure that everyone is treated fairly and gets what they deserve.
	**Just War Theory**	A Christian theory that asks whether a war is fought justle.	One of the conditions of **Just War Theory** is that war is only ever a last resort.
	**Khalsa**	Community of initiated Sikhs who are committed to upholding Sikh principles such as defending the faith.	The Khalsa was created by Guru Nanak to protect the Sikh community and uphold righteousness.
	**Peace making**	Creating a state of happiness and harmony, the opposite of war and conflict.	We will send a **peace-making** mission to the area of the country where there is the most fighting.
	**Protest**	A public expression of disapproval, often in a big group. Can be peaceful or violent.	The workers held a **protest** to demand better pay and conditions.
	**Quakers**	A Christian denomination who worship in silence and are pacifists	**Quakers** did not fight in WWI, but they were happy to work as nurses to help heal the soldiers back to health.
	**Reconciliation**	Restoring friendly relationships after a war or conflict.	.After years of conflict, the two nations worked toward **reconciliation.**
	**Retaliation**	Deliberately harming someone as a response to them harming you	**Retaliation** can escalate over time, as one attack leads to another causing communities to fall apart.
	**Self-defence**	Protecting yourself or others from harm	People are allowed to use **self-defence** to protect themselves from harm.
	**Pacifism**	A belief that all forms of violence are wrong, commonly held by quakers	**Pacifism** does not work you cannot avoid violent conflict when one group tries to oppress another.
	**War**	**C**onflict involving organized fighting between countries, groups, or organizations, often using weapons and lasting for an extended period of time.	**War** often causes destruction and suffering for everyone involved

As a Year 9 theologian I can explain religious views on conflict

As a Year 9 RE theologian, I …	
I can explain the origins of the Sikhi faith	1
Know key Sikhi beliefs about Conflict	2
Know key Christian beliefs about Conflict	3
Can compare Christian and Sikhi views	4

1

The was formed by at in AD1699. It is a group into which committed Sikhs can be initiated to demonstrate their devotion to their faith.
The Khalsa commemorates five volunteers who were prepared to offer their lives for and Guru Gobind Singh. Their commitment is an example of – a willingness to serve others without thought for your own wellbeing.

The Five Ks are key symbols worn by baptized Sikhs to show their faith:

1. Kesh: Uncut hair, symbolizing respect for God's creation and naturalness.
2. Kara: A steel bracelet, representing the eternal nature of God and commitment to truth.
3. Kanga: A wooden comb, symbolizing cleanliness and order.
4. Kachera: Cotton undergarments, signifying modesty and self-control.
5. Kirpan: A ceremonial sword, representing the defence of justice and protection of the weak.

2 **4**

Sikhi Views on Pacifism

Few Sikhs are pacifists because they believe that war and conflict is justified in defence of their faith, or if fighting to combat oppression or a lack of human rights. Sikhs aim to build harmony between faiths and nations, but most would accept war as a means of achieving this as a last resort. Sikhism requires each Sikh to become a saint-soldier (Sant Siphahi): someone who prays and works for peace like a saint but has the courage and ability to fight for justice and peace if all other means fail, like a soldier

Sikh Protests:
In 1972, the Road Traffic Act made it compulsory for all riders of motor bikes to wear a crash helmet. This was a problem for turban-wearing Sikhs who were faced with having to either break UK law or their religious requirements as members of the Khalsa. Sikhs felt they were justified in protesting. In fact, it was because they wished to obey UK law that they wanted to see a change to enable them to keep within the law while still practicing their faith

Key Quotes from the Guru Granth Sahib

- "Violence, attachment, greed and anger" says Guru Nanak "are like four rivers of fire. Falling into them, one is burned. O Nanak! One is saved only by holding tight to good deeds" – **encourages Pacifism**
- Sikhs should never be the first to "draw their swords". – **encourages Self-Defence**
- "It is sinful to submit to the oppressor and the miscreants. Humility should be exhibited only where it is effective. – **encourages going to war as a last resort.**
- "A true warrior is one who fights for the downtrodden, the weak and the meek." – **encourages Self-Defence**
- "I was born to advance righteousness, to free the good, and to destroy all evil-doers root and branch" – **encourages Self-Defence and promoting justice.**

3 **4**

Just War Theory is a Christian moral theory for working out if a war meets internationally accepted criteria

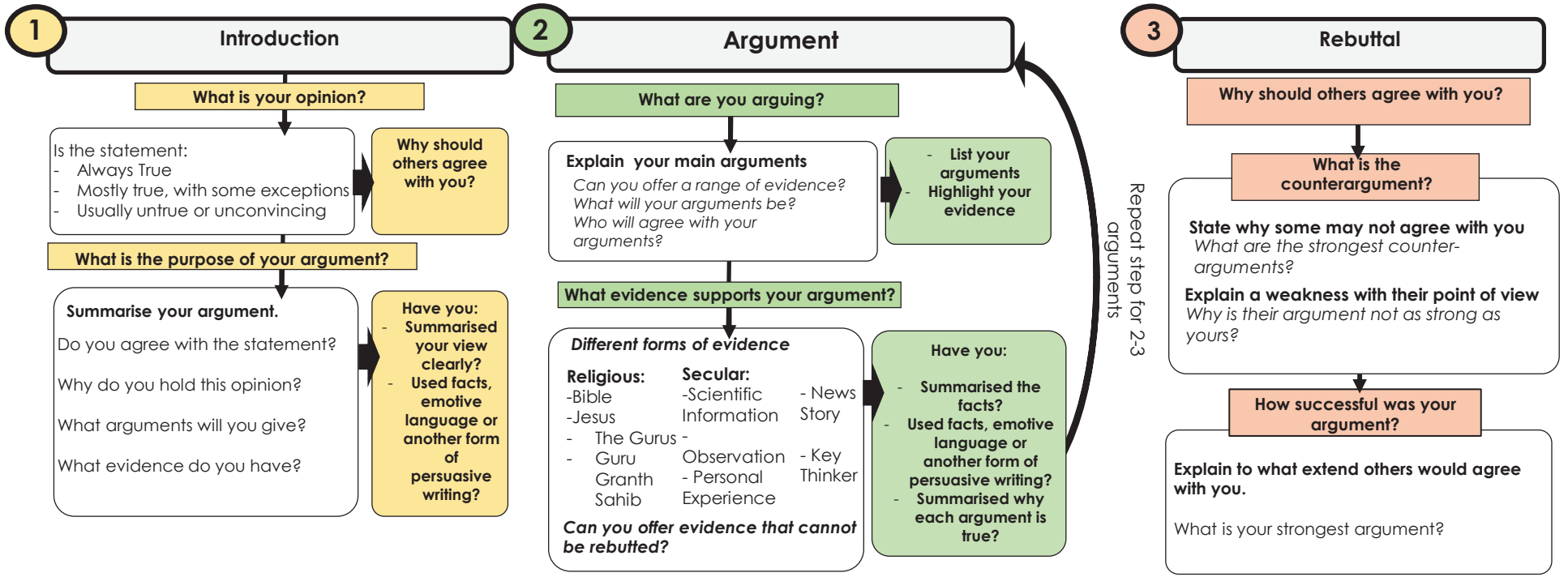
1. **for fairness. These are some of the conditions that must be met in order for a war to be just:**
2. **• Just Cause – fought in self-defence or to protect others**
3. **• Just Intention – fought to promote good and defeat wrongdoing**
4. **• Last Resort – only going to war if all other methods have been tried first**
5. **• Proportional – excessive force should not be used, and innocent civilians must not be killed.**

A Holy War is a war which is fought for religious reasons, often with the backing of religious leaders. An example of this was the Crusades fought from the 11th-14th Century by Christians, backed by the Pope. Religion can still be a cause for war today such as in Northern Ireland where Protestant and Catholic Christians fought a civil war between 1968-98.

Pacifism is the idea that all forms of violence are wrong. Pacifists such as Quakers refuse to take part in war and often choose to be a conscientious objector (someone who doesn't go to war for moral reasons) or to assist in medical tasks like ambulance driving. Christians try to follow Jesus' teaching that "blessed are the peacemakers"

Christians try to show mercy and agape to victims of war and provide them with assistance. This can be through charity or through welcoming them into their churches. It can be victims in their own country or refugees such as people fleeing from Syria or Yemen. This is an example of 'love your neighbour' in action.

Skills – Debating Conflict



Model Paragraph: "Violence is never justified" To what extent do you agree?

1. Although in most cases the statement is true, there are some important exceptions. I will argue that in cases of conflicts were innocent lives are in danger violence is sometimes justified.
2. Firstly, although going to war is a last resort many people including Sikhs and Christians would agree that sometimes we are forced into war. For example, according the principles of Just War Theory in Christianity if a conflict is for a good cause such as standing up for an oppressed group then violence can be justified. In this case going to war will result in long term peace.
3. Some may argue that violence can never achieve peace as it may be hard to end the conflict. Pacifists would say that violence is a destructive force, and conflict often hurts innocent people too. However, it is important to remember that ignoring injustice is an even worse solution. If a group of people is being oppressed by a violent group than the solution may have to include a violent defence as well.
2. Similarly in the Sikh faith, being a defender of the oppressed is encouraged. The Guru Granth Sahib teaches Sikhs that a "true warrior is someone who stands up for the meek" showing us that we should not go to war to be violent but because it can help those in need. This teaching is useful because it also teaches that a true warrior does not always choose violence but thinks carefully about the consequences of their actions.
3. Overall, although often unnecessary violence is sometimes justified. Although a pacific worldview is more peaceful in a world where injustice exists it is important to stand up for the oppressed to create a better future for everyone.

Core focus
All learners
HT only
Triple science only

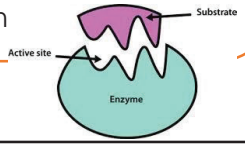
B3 Organisation

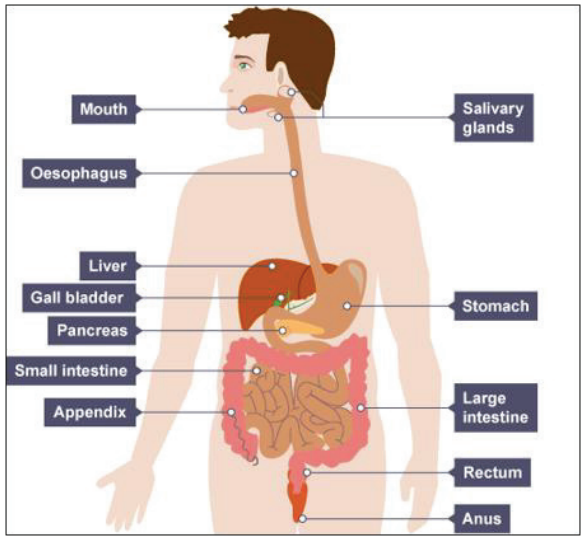
Tissues (group of similar specialised cells)
In the stomach, there are 3 types of tissues.

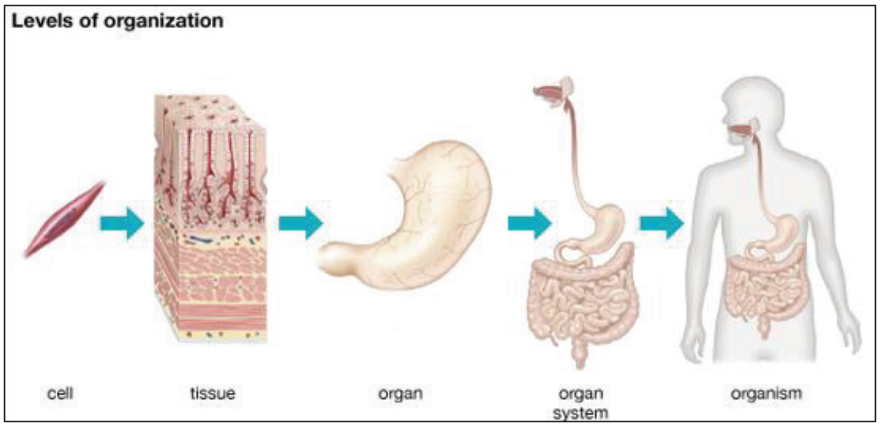
- **Muscular** – to churn the food and digestive juices together
- **Glandular** – to produce the digestive juices that break down the food
- **Epithelial** – covers the inside and outside of the organ

Efficient Digestion

- **Villi**, found in the small intestine, increase surface area and have a good blood supply, allowing for quick diffusion.
- **Bile** emulsifies fat into smaller droplets, increasing the surface area, as well as increasing the pH of the contents that have left the stomach







Enzymes
They are biological catalysts, which speed up reactions.
Each enzyme's **active site** is specific to the **substrate**, and they bind together using the 'lock and key' theory.
Enzymes have an **optimum** temperature and pH, at which they work best.
If enzymes get too hot or are in the incorrect pH, they can become **denatured**, where the active site changes shape, and the enzyme will no longer work.

Required Practical: Food tests

Nutrient	Reagent	Starting colour	Indicator colour
Starch	Iodine	Orange	Blue/black
Glucose	Benedict's	Blue	Brick red
Protein	Biuret	Blue	Purple
Lipids	Ethanol	Clear	Cloudy layer on top

Nutrient	Sources	Uses	Enzyme	Breakdown Products
Lipids (fats)	Oils, butter, cheese, cream	Insulation, energy, cell membranes	Lipase	Fatty acids and glycerol
Carbohydrates	Bread, potatoes, rice and pasta	Energy	Carbohydrase (amylase for starch)	Glucose, simple sugars
Proteins	Meat, fish, pulses, eggs and cheese	Growth and repair, tissues, hormones, enzymes	Protease (Pepsin in the stomach)	Amino Acids

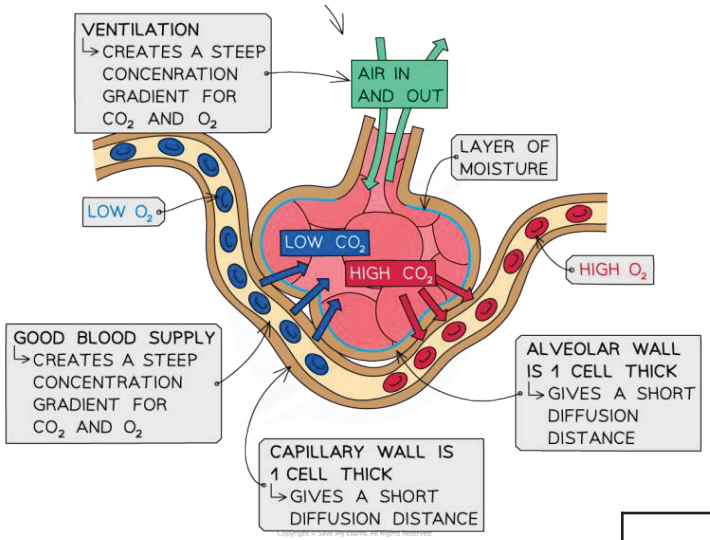
Biology | Organisation | Topic Dictionary

Word	Definition	In a sentence…
Organ	Group of specialised tissues working together	The heart is a vital **organ** that pumps blood throughout the body.
Mouth	Mechanical breakdown of food, increasing surface area	She opened her **mouth** to speak.
Salivary glands	Moisten food and secrete amylase	The **salivary glands** produce saliva, which helps break down food.
Stomach	Acts as a muscular bag to churn food. Contains HCl to kill any pathogens. Contains protease(pepsin).	After skipping breakfast, her **stomach** growled loudly during the meeting.
Gallbladder	Stores bile	The surgeon explained that the **gallbladder** was inflamed and needed to be removed.
Liver	Produces bile	The doctor emphasized the importance of a healthy diet to support **liver** function.
Pancreas	Produces all enzymes; lipase, protease and carbohydrase	The **pancreas** plays a crucial role in regulating blood sugar levels.
Small Intestine	Absorbs nutrients. Contains all enzymes; lipase, protease and carbohydrase	Nutrients from the food we eat are absorbed primarily in **the small intestine.**
Large Intestine	Absorbs water	Water is absorbed from digested food as it moves through the **large intestine.**

B4+9 Animal Organs and Respiration

Core focus
All learners
HT only
Triple science only

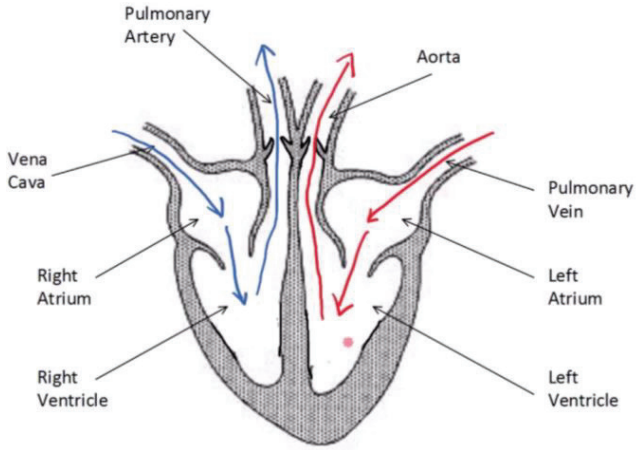
Alveoli



Alveoli

1. Large surface area, more surface for diffusion to occur
2. Rich blood supply, maintains concentration gradient
3. Alveoli walls are one cell thick, short diffusion distance
4. Well ventilated, maintains concentration gradient

The Heart



Coronary heart disease (CHD)

- Coronary artery supplies the heart with O_2
- CHD occurs when this artery becomes blocked with fatty material
- This stops blood (O_2 and glucose) from reaching the cardiac tissue
- Causing the heart to respire anaerobically

CHD can be corrected by:

- Using a stent – metal mesh that opens artery
- Bypass surgery – damaged artery replaced with a vein
- Statin – drug that lowers blood cholesterol

Helping the heart

Heart rate is controlled by a group of cells called the pacemaker. Found in the right atrium.	
Leaky valves	Cause blood to flow in wrong direction. Can be replaced by artificial valves
Artificial pacemaker	Electrical device. Corrects irregular heart rhythms.
Artificial hearts	Used to keep patients alive when waiting for a transplant

Blood Vessels

Artery	thick, elastic wall; small lumen
Vein	thin wall; large lumen; valve
Capillary	single cell wall

Blood flow = $\frac{Volume\ of\ blood}{Number\ of\ minutes}$

Cardiac output = the volume of blood pumped from the left ventricle per minute
= stroke volume x heart rate

Biology | Animal Organs | Topic Dictionary

Word	Definition	In a sentence…
Blood	A tissue that transports substances around the body. Made of four components	The heart pumps **blood** around the body.
Red Blood Cell	Cell that carries oxygen around the body. Has large SA:V, no nucleus.	**Red blood cells** travel through your veins and arteries, delivering oxygen to the rest of your body.
White Blood cell	Fights infections. Can produce antibodies and antitoxins, and can engulf pathogens.	**White blood cells** help protect your body by fighting off infections and diseases.
Plasma	Carries cells and substances around the body	**Plasma** makes up most of your blood and helps transport nutrients, hormones, and waste products around the body.
Platelets	Cell fragments that clot wounds	**Platelets** help your blood clot when you get a cut, preventing you from bleeding too much.
Arteries	Carry blood away from the heart. Small lumen, elastic walls	The **arteries** carries oxygen-rich blood from the heart to the rest of your body.
Veins	Carry blood to the heart. Thin walls, large lumen, has valves	**Veins** carry blood back to the heart after it has circulated through the body.
Capillaries	Allow exchange of materials. Thin and permeable walls	**Capillaries** are tiny blood vessels where oxygen and nutrients pass from the blood into the cells.
Double circulatory system	Blood enters the heart twice during one circuit.	**Humans** have a double circulatory system, where blood flows through the heart twice.
Heart	Organ that pumps blood around the body. Made of cardiac tissue.	The **heart** pumps blood around the body,

B9 Respiration

Core focus
All learners
HT only
Triple science only

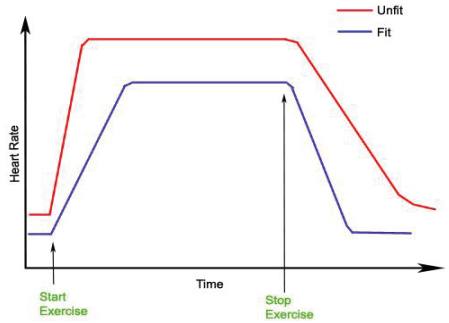
Equation for aerobic respiration:

glucose + oxygen → water + carbon dioxide (+ energy released)

$C_6H_{12}O_6 + 6O_2 \rightarrow 6H_2O + 6CO_2$

Why do living things respire?

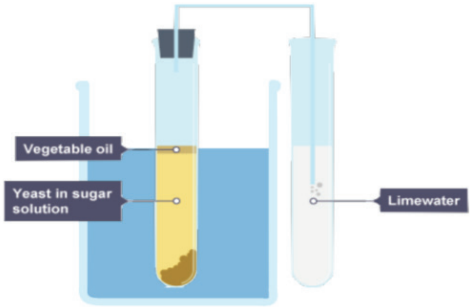
1. Maintain body temperature
2. Muscle contraction
3. Synthesis of larger molecules
4. Plants use the energy for active transport and to convert sugars and nitrates into amino acids.



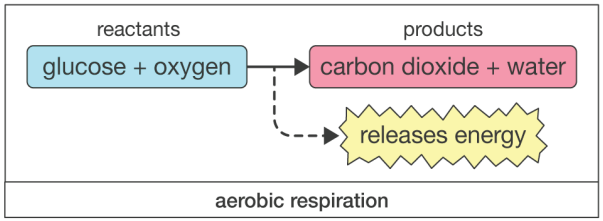
When you start to exercise your heart rate and breathing rate increases. **This provides more oxygen to the muscles for aerobic respiration.**

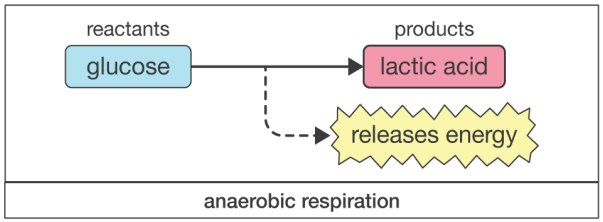
Investigating Respiration

This experiment shows that the Yeast is respiring. Carbon dioxide is produced by the yeast when it respires and travels into the second test tube where it turns the limewater cloudy. The speed at which this happens can be used to calculate the rate of respiration.



In humans:





Equation for anaerobic respiration in humans:

Glucose → Lactic acid + (energy released)

Oxygen Debt

Lactic acid is produced during **anaerobic respiration.** Lactic acid causes the muscles to become fatigued. When a person stops exercising and stops respiring anaerobically, they have an **oxygen debt.** The oxygen debt is the volume of oxygen required to breakdown (oxidise) all of the lactic acid. The bigger the oxygen debt the longer it will take for the person to fully recover.

lactic acid + oxygen → carbon dioxide + water

Equation for anaerobic respiration in plants and yeast:

Glucose → ethanol + carbon dioxide (+ energy released)

Role of the Liver

1. Detoxifying poisonous substances such as ethanol from alcoholic drinks
2. Breaking down old red blood cells
3. Storing iron to make new red blood cells
4. Converting lactic acid back into glucose

Biology | Respiration | Topic Dictionary

Word	Definition	In a sentence…
Alveoli	Small sacs found in the lungs. Allow exchange of O_2 and CO_2.	Oxygen passes from the air into the blood through tiny sacs in the lungs called **alveoli**.
Respiratory system	Consists of the trachea, bronchi, alveoli, and a network of capillaries around the alveoli.	The **respiratory system** helps you breathe by taking in oxygen and removing carbon dioxide from the body.
Respiration	An exothermic reaction that releases energy.	During exercise, your body needs more oxygen for **respiration** to produce energy for your muscles.
Exothermic Reaction	A reaction which transfers energy to the environment.	When you light a match, it causes an **exothermic** reaction.
Mitochondria	Where aerobic respiration takes place.	**Mitochondria** are often called the powerhouses of the cell because they produce the energy the cell needs to function.
Aerobic Respiration	The release of energy from glucose in the **presence** of oxygen.	When you run, your muscles use **aerobic respiration** to produce energy, as long as there is enough oxygen.
Anaerobic Respiration	The release of energy from glucose in the **absence** of oxygen.	During a sprint, your muscles might use a**naerobic respiration** to get energy when there isn't enough oxygen.
Lactic acid	Produced during anaerobic respiration when glucose is incompletely broken down.	After running fast for a long time, your muscles may produce **lactic acid**, which can make them feel sore.
Glycogen	Muscles store glucose as this carbohydrate.	When you exercise, your body breaks down **glycogen** stored in your muscles to provide energy.
Heart Rate	The number of times your heart beats in 1 minute.	Your **heart rate** increases when you exercise to pump more blood and oxygen to your muscles.
Oxygen Debt	The amount of oxygen required to break down the build -up of lactic acid after exercise.	After sprinting, you feel out of breath because your body is in **oxygen debt** and needs extra oxygen to recover.
Metabolism	The sum of all the reactions in the body.	People with a faster **metabolism** burn energy more quickly.

P8 Forces in balance

Core focus
All learners
HT only
Triple science only

Vector and scalar

All quantities in physics can be grouped as either a scalar or a vector.

Both vectors and scalars have magnitude (size) but only vectors have direction.

A good way to check is to add a direction and read it aloud to see if it makes sense. E.g. a force of 5N pushing to the right makes sense whereas 10J of energy going east does not make sense. Force is a vector, energy is scalar

Vector arrows

Vectors are often represented with an arrow. This is because an arrow can show magnitude (size), by how large the arrow is, and

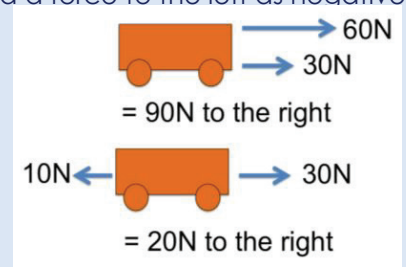
Vector	Scalar
Force	Speed
Displacement	Distance
Velocity	Mass
Acceleration	Energy
momentum	time

Resultant force

A resultant force is the result of adding up all of the forces on an object.

If the forces are in the same direction they will add together.

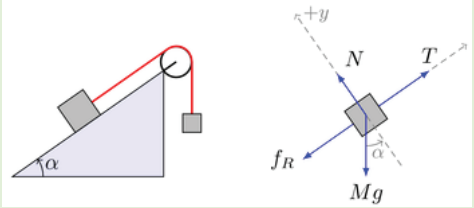
If the forces are in opposite directions, they will cancel out. You can think of it as a force to the right being positive and a force to the left as negative.



Free-body force diagram

A free-body force diagram helps to simplify a forces problem by only focusing on the forces on an object.

In the example below we can separate the forces on the object on the slop into the reaction force (N), tension (T), friction (f) and weight (Mg).



Moments

A moment is the turning effect as the result of a force being applied some distance away from a pivot.

The moment is equal to the force applied multiplied by the perpendicular distance to the pivot.

Moment(Nm) = force (N) x distance (m)

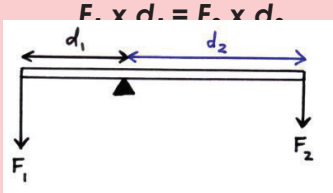
We can increase the turning effect by increasing the force applied or by increasing the perpendicular distance to the pivot.

You can test this by opening a door close to the hinge and far away from the hinge. Opening the door by pushing close to the hinge will be harder as the distance is less.

The principle of moments

The principle of moments states that for an object in equilibrium, the sum of the clockwise moments is equal to the sum of the anticlockwise moments.

$F_1 \times d_1 = F_2 \times d_2$



P8 Forces in balance

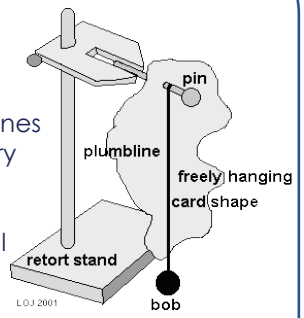
Core focus
All learners
HT only
Triple science only

Centre of mass

The centre of mass of an object is where an objects mass can be **thought** of as being concentrated. If you support an object at the centre of mass it will balance

In a symmetrical object the centre of mass will be where all of the lines of symmetry cross. you can test this by drawing the lines of symmetry on a piece of paper and balancing it on your finger.

If you need to find the centre of mass on an irregular object you will need to suspend it from one side. The centre of mass will hang below where it is supported from. If you use a plumb line to draw straight down from where it is supported the centre of mass will be somewhere on the line. Repeat the process but suspend it from a different side. Where the two lines meet you will find the centre of mass. You should do it a third time to check that you were accurate.

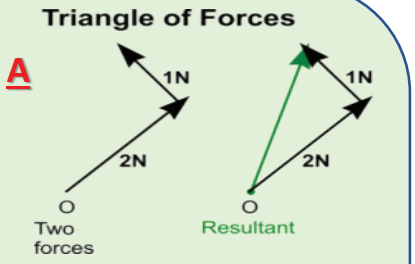


Triangle of forces

Any force (or other vector) can be split into two perpendicular forces. In the same way, two perpendicular forces can be added together to make a resultant force.

In example A we have two perpendicular forces drawn to scale. In the second picture we have connected the two forces making a right angle triangle. Providing everything was drawn to scale we can measure the resultant force and the angle. We can use Pythagoras' theorem to calculate the magnitude of the force.

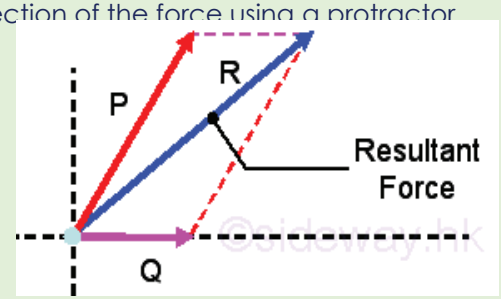
In example B we have a block on a slope. The yellow arrow represents the weight (mg) of the block and has been split into two perpendicular vectors again making a right angle triangle. One of the vectors points directly into the slope and the other points parallel to the slope.



Parallelogram of forces

If two forces are not acting in the same line it can be challenging to resolve their forces. In the photograph, two tug boats are pulling something through the water. Neither tugboat can pull the object straight forwards as they would collide. Each tug boat is pulling slightly away from the other as well as forward. The result of these two forces on the object is that it goes straight through the water.

The diagram below shows how we can resolve these forces. Using a compass we can have force Q coming from the tip of force P and force P coming from the tip of force Q. this forms a parallelogram of forces. We can then draw the resultant force R from the origin to the opposite corner. Providing the diagram is all drawn to scale we can measure the magnitude of the resultant force using a ruler and the direction of the force using a protractor.



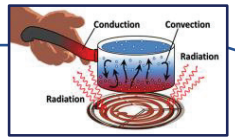
Physics | Forces in Balance | Topic Dictionary

Word	Definition	In a sentence…
Vector	A quantity with both magnitude (size) and direction.	We use **vectors** to show the direction and strength of forces acting on an object.
Scalar	A quantity with magnitude (size) but no direction.	Speed is a **scalar** because it tells you how fast something is moving, without any information about direction.
Resultant force	The sum of all the forces acting on a body.	The **resultant forces** on the box were balanced, so it didn't move.
Scale diagram	A diagram where the dimensions are drawn to a predetermined ratio.	We drew a **scale diagram** to help us find the resultant force acting on the object.
Newton's first law	If the resultant force on an object is 0N and the object is at rest then it will remain at rest. If the object is moving it will continue to move at the same speed and in the same direction	**Newton's First Law** says that a moving ball will keep rolling unless something like friction or a force stops it.
Newtons third law	When two objects interact they exert equal and opposite forces on each other.	According to **Newton's Third Law**, when you push against a wall, the wall pushes back with an equal and opposite force.
Moment	The turning effect of a force. For example, pulling on a spanner results in a turning effect	The **moment** is stronger if you push the door farther from the hinge.
Centre of mass	The point at which an objects mass can be thought of as being concentrated.	When you balance a ruler on your finger, the **centre of mass** is the point where it stays balanced.
Free-body force diagram	A diagram to show the forces acting on an object with on other objects or forces shown.	We drew a **free-body force diagram** to show all the forces acting on the car as it moves.

P2 + P3 Energy Transfers and Resources

HT only | Core focus | Triple science only | All learners

Conduction



Non-metal:
In a non-metal the atoms which are being **heated start to vibrate more**, this causes them to **bump into the atoms** around them **passing the energy on**. This process is **relatively slow** meaning non-metals are typically **poor conductors**. This is why saucepan handles are often made of wood or plastic, they don't get hot quickly!

Metals
In a metal there are **free electrons** which can move around in the material. This means that when those **electrons gain energy by being heated** they can move much more quickly through the material. This makes metals **good conductors** of heat. The body of a saucepan is made of metal as it can conduct the heat quickly from the heat source underneath into the food.

Specific heat capacity

All materials store heat, the specific heat capacity of a material tells you about how much heat that material can store. It is an intrinsic property of a material, similar to how density is an intrinsic property.

The specific heat capacity of a material tells you how much energy you would need to raise the temperature of 1kg of a material by 1 °C. the Specific heat capacity can be calculated using the equation below. This equation **IS** given you on the equation sheet in the exam.

$$Energy\ (J) = mass\ (kg) \times specific\ heat\ capacity\ \left(^{J}/_{kg\ .\ ^{\circ}C}\right) \times temperature\ change\ (^{\circ}C)$$

Worked example
If the specific heat capacity of water is 4200 J/kg °C, how much energy would it take to raise the temperature of 2kg of water from 20 degrees to 50 degrees?

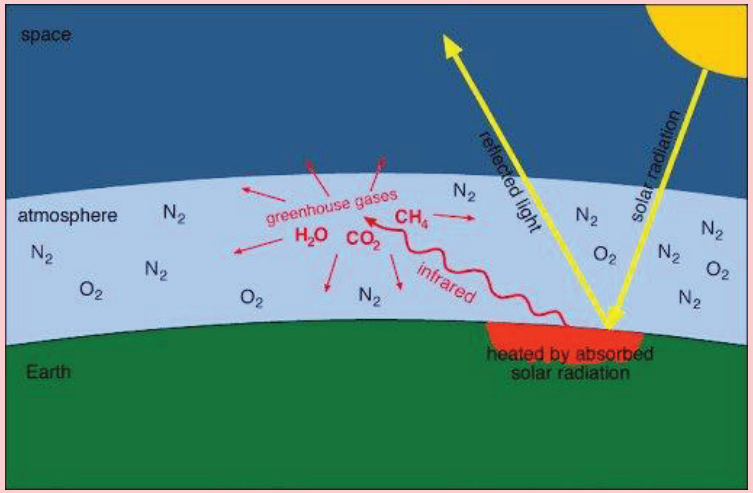
$$Energy = 2kg \times 4200 J/kg \cdot ^{\circ}C \times 30^{\circ}C$$
$$Energy = 252000J$$
$$Energy = 252\ kJ$$

Infra-red radiation (IR)

IR is electromagnetic radiation with a slightly longer wavelength than visible light. As IR and visible light are so close they act in a very similar way, for example they are reflected more by shiny white materials and absorbed by matt black materials. IR can be used to see in the dark by special cameras as all materials give off an amount of infrared light depending on the material and it's temperature.
IR can travel through a vacuum, otherwise you wouldn't feel any warmth from the sun!

The greenhouse effect

Energy from the sun hits the surface of the earth, some of it is reflected back into space and some is absorbed. The absorbed energy warms the surface of the planet so it gives off more IR. This IR is absorbed by greenhouse gasses in the atmosphere before being remitted in a random direction. This means some of the absorbed IR will be reemitted back towards the earth, raising it's temperature. The more green house gasses there are, the more heat will be trapped by the atmosphere.



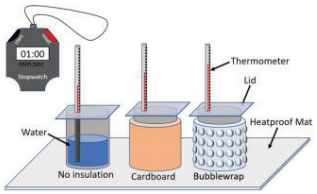
P2 + P3 Energy Transfers by Heating

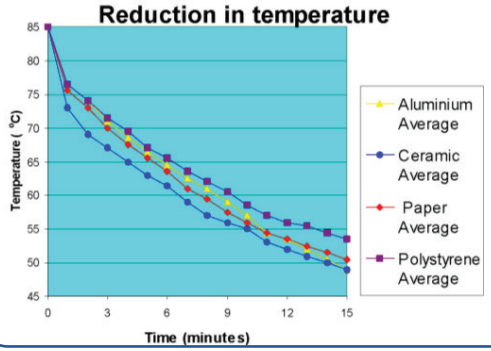
HT only | Core focus | Triple science only | All learners

Required practical – Insulation

This practical is designed to allow you to test how good different materials are at insulating.

1. Wrap 1 layer of each of your chosen insulation materials around sperate beakers. Leave one beaker uncovered as a control.
2. Freshly boil water and measure out 100cm3 into the beakers using a measuring cylinder.
3. Put a lid with a thermometer onto each beaker. Once the thermometer reads a certain temperature e.g. 85 degrees.
4. Read and record the temperature every minute for 15 minutes
5. Plot a graph of temperature against time. Put all of your data onto the same graph as shown.
6. The quicker the line drops, the worse the insulation as it lets the heat out more quickly.

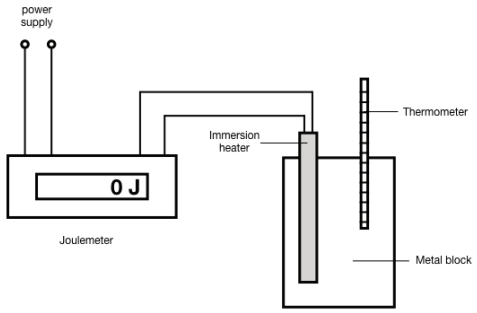




Required practical – Specific heat capacity

In this practical you are asked to find the specific heat capacity (SHC) of a metal. We typically use 1kg aluminium cylinder.

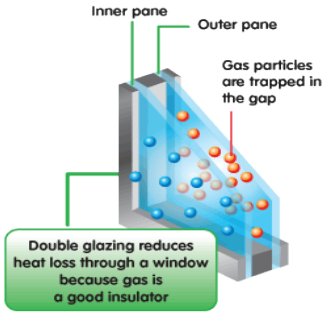
1. The metal block will have two holes in, one for the heater and one for the thermometer. Make sure you put a drop of oil into each hole to improve the heat transfer
2. Insert the thermometer and wait a couple of minutes for the thermometer reading to settle before taking the initial temperature
3. Turn on the heater and wait for it to heat up before inserting it into the metal block and turning on the joulemeter.
4. Once the temperature of the block has risen 10 degrees record the energy added on the joulemeter.
5. You now have the energy added, mass of the block, and the temperature change and can use the equation overleaf to calculate the specific heat capacity for the material the block is made from.
6. To reduce errors in the experiment you can cover the block in insulation to reduce heat lost to the surroundings.



Insulation

Materials designed to keep heat in, whether a Jumper for you or fibreglass for your house is designed to trap pockets of air. Air is a bad conductor of heat due to gasses not having many particles to collide with the surface.

The diagram shows how a double glazing window uses this effect to keep your house warm.



Reducing heat loss in homes

Many things can be used to reduce heat loss in homes. Some examples are; double glazing windows, curtains, loft insulation, draught excluders, cavity wall insulation, curtains, and carpets. Installing these into your home will reduce the heat lost and therefore reduce your heating bills.

Pay back time

All of the above methods of reducing heat loss in your home cost money to install but save you money over time. We can work out how long it will take for something to pay for itself in savings by working out the payback time.

$$Payback\ time(years) = \frac{initial\ cost\ (£)}{saving\ per\ year\ (\frac{£}{year})}$$

P2 + P3 Energy Resources

HT only | Core focus | Triple science only | All learners

Non-renewable energy

Fossil fuels

Coal, oil and gas are the three fossil fuels. Their advantages and disadvantages are very similar.

Advantages

- Very reliable
- High 'energy density' meaning they can produce a lot of electricity in a small space
- Gas has a low start up time

Disadvantages

- Produce carbon dioxide, a green house gas which leads to global warming
- Fossil fuels will run out
- Can release sulphur dioxide when burnt, leading to acid rain

Nuclear

Typically uranium or plutonium is used as fuel for nuclear power stations. Heat is released when the large nuclei split, this is used to generate electricity.

Renewable

Wind

A wind turbine is typically three large wing shaped blades atop a narrow tower. The wind makes the blades spin which turns a generator. A wind turbine only produces electricity when the wind is blowing so it is unreliable, however it does not produce any carbon dioxide or other greenhouse gases in operation.

Solar

Solar energy can either be used to directly heat water to reduce the need for electricity/natural gas to heat it, or it can be used to generate electricity. Photovoltaic cells (which produce electricity when the sun hits them) are very expensive to purchase but are almost free to run once installed. Solar panels of all kinds work better on hot sunny days and do not work at all at night. They do not produce any greenhouse gases once installed.

Geothermal

Geothermal power uses the heat of the earth to boil water, which is piped deep underground, into steam. This is used to turn a turbine which turns a generator. Geothermal energy is very reliable but can only be used in certain areas. Places with a lot of tectonic activity, such as Iceland, are most suited to geothermal energy.

Biofuel

Biofuel works very similarly to fossil fuelled power stations (see overleaf). The main difference is that the fuel (e.g. wood or sugar cane) is grown, this growing process draws carbon dioxide out of the atmosphere, it also means that the fuel can be replaced making it renewable. The carbon dioxide drawn in when growing is released again when burnt making the process carbon neutral.

P2 + P3 Energy Resources

HT only | Core focus | Triple science only | All learners

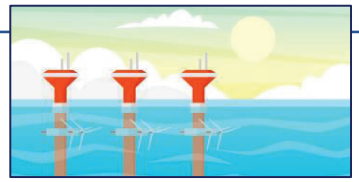
Renewable (continued)

Hydroelectric
A hydroelectric dam is made my blocking a river in a valley with a large concrete wall. The river will fill up the basin made by the dam wall and the sides of the valley. Once an appropriate height of water is behind the wall then the water is allowed to flow through an opening with a turbine in. the turbine spins a generator which then produces the electricity.
This is very (relatively) cheap and does not produce any green house gases when operating however it can disrupt wildlife and entire towns can be relocated

The energy transfer is: gravitational potential → kinetic → electrical

Tidal
Tidal power can be in the form of an underwater turbine similar to a wind turbine however this relies on incredibly powerful tides meaning not many areas are suitable. More common tidal power uses a tidal barrage. This traps water inside a walled area at high tide and lets it run out through a turbine during low tide. The barrage refills when the tide comes back in, this water can be let in through the turbine generating more electricity again.

Waves
Wave power uses the rocking motion of the waves to generate electricity. These systems are usually small and expensive meaning they are only suitable in remote locations where not much energy is needed and large infrastructure is not able to be constructed easily.



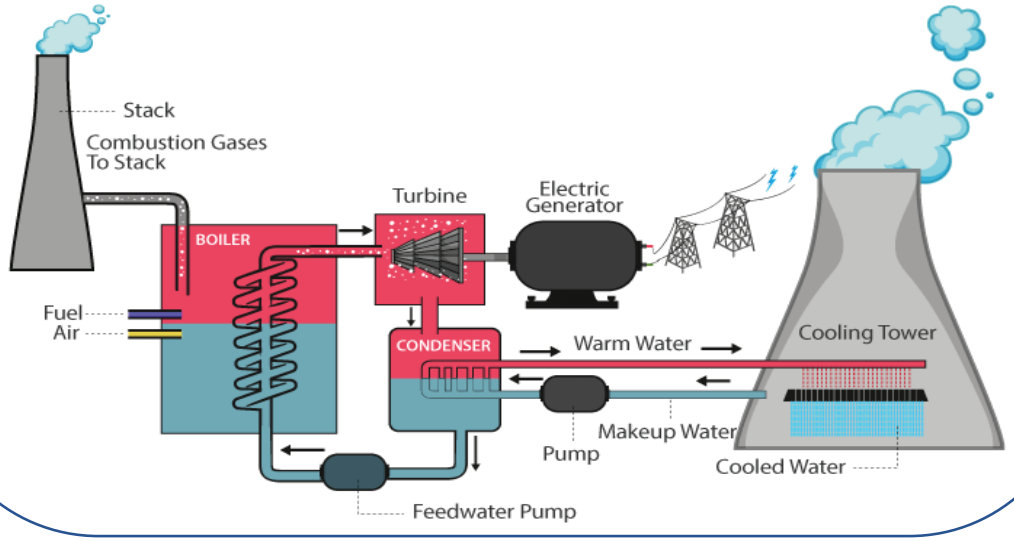
Pumped storage

When an excess of electricity is produced due to the variations in demand and the unreliable nature of a lot of renewable power sources, water can be pumped back up a hydroelectric dam. When there is an increase in demand this water can be released to flow back through the dam giving more electricity to the national grid.

How electricity is generated in a thermal power station

1. The fuel is burnt to convert chemical energy in the fuel to heat energy
2. The heat is used to boil water into steam
3. The steam makes a turbine spin which in turn makes a generator spin
4. The generator converts the kinetic energy from spinning into electricity
5. The steam is condensed back into water before being recycled back into the boiler.

In a nuclear power station the fuel is not burnt, the heat comes from nuclear fission. To reduce the risk of a serious accident the heat is transferred from the fuel to the boiler using a separate heating medium, e.g. oil or molten salt.



Physics | Energy Transfers + Resources | Topic Dictionary

Word	Definition	In a sentence...
Heat	Thermal energy – measured in Joules (J)	The **heat** from the fireplace made the room feel warm.
Temperature	How hot or cold something is.	The air **temperature** dropped so she put on a coat.
thermometer	A piece of equipment used to measure the temperature of something.	He used the **thermometer** to see how warm the water was.
Conduction	Heat transfer by particles colliding with each other. This is the primary method of heat transfer in solids.	The metal spoon became hot because heat was transferred from the hot soup through **conduction**.
Convection	Heat transfer in fluids (liquids and gasses). As the hotter parts of the fluid spread and become less dense they 'float' on top of cooler fluid creating a convection current.	The warm air rising from the heater created **convection** currents that spread heat throughout the room.
Infra-red radiation	Part of the electromagnetic spectrum. Similar to visible light but with a longer wavelength. What you feel as heat when you put your hand near something hot.	The metal fork became hot as it was heated by **infra-red radiation** from the campfire.
Insulation	Material to reduced conduction. Typically a non-metal or a material with air pockets such as fibreglass.	The metal fork became hot to the touch, but the plastic handle had good **insulation**, allowing her to hold it without burning her hand.
Greenhouse gases	Gasses with absorb and re-emit infrared radiation causing the greenhouse effect. E.g. carbon dioxide.	The melting ice caps are a direct consequence of the rising levels of **greenhouse gases** in the atmosphere.
Specific heat capacity	The amount of energy required to raise the temperature of 1kg of a material by 1 degree.	The **specific heat capacity** of water is high, which is why it takes longer to heat up compared to most metals.

Physics | Energy Transfers +Resources | Topic Dictionary

Word	Definition	In a sentence...
Renewable	An energy resource which will not run out or which can be replenished as it is used. E.g. biofuel	Solar energy is a **renewable** resource, unlike fossil fuels that can eventually run out.
Non-renewable	And energy resource which will run out and cannot be easily or quickly replaced. E.g. nuclear energy.	Coal is a **non-renewable** resource, which is why there is growing concern about its environmental impact.
Fossil fuel	Fossil fuels are fuels that come from old life forms that decomposed over a long period of time. The three main fossil fuels are; coal, oil, and natural gas.	Countries plan to switch from **fossil fuels** to cleaner sources of energy to combat climate change.
Reliable energy	An energy source where you can have a constant supply. You can choose how much you want. E.g. you could choose to burn less natural gas to generate less electricity.	**Reliable energy** can meet demand, regardless of conditions such as weather or time of day.
Start up time	How long it takes a power station to start generating electricity after 'turning it on'.	The **start-up time** of the power station was 2 days.
Global warming	The effect caused by the release of greenhouse gases, such as carbon dioxide, when fossil fuels are burnt. Global warming leads to climate change.	**Global warming** has led to more frequent and severe storms, causing widespread damage to coasts.
Payback time	Pay back time is how long something takes to pay for itself.	If a solar panel cost £2000 but saved you £200 a year on your electricity bill then it will have a **payback time** of 10 years.

Skills guide- Standard form

You can use **standard form** to represent **very large** or **very small** numbers. Standard form makes use of the **laws of indices** but numbers are only expressed in one base, **base 10**.

We use standard form to easily write very, very large numbers and very, very small numbers. A number is in standard form when it is written in the form: a × 10n a is a number greater than, or **equal to 1, and less than 10.**

n is an integer (whole number). **If n is positive**, *we are dealing with a large number*. **If n is negative**, *we have a small number (less than 1)*.

The power of n tells us how many times we multiply by 10 (if n is positive) or divide by 10 (if n is negative). Informally, we can say that n tells us how many places the digits have moved in relation to the decimal point.

13×10^5 is not in standard form because 13 is larger than 10

0.75×10^4 is not in standard form because 0.75 is less than 1.

Examples:

2.5×10^3 $\quad$ 4.62×10^5

Converting to Standard Form:

When changing **large** numbers into standard index form. The index notation will be **positive**.

2.4900 = 2.49×10^4

7.800000000 = 7.8×10^9

5.43 x 10^5 = 5.43×10^7

1.700 x 10^{-8} = 1.7×10^{-5}

When changing **small** numbers into standard index form. The index notation will be **negative**.

0.049 = 4.9×10^{-2}

0.000000008210 = 8.21×10^{-9}

0.0033 x 10^7 = 3.3×10^4

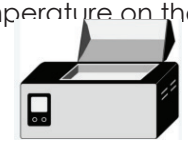
0.071 x 10^{-11} = 3.3×10^{-13}

Skills guide – Planning an experiment- Enzymes

When planning an experiment, you must identify your variables:

Independent variable- the factor you change
Dependent variable- the factor you are measuring (think about the results you are collecting and how you will collect it
Control variable- The factors you will keep the same, to get reliable results.

Planning an experiment on the effect of temperature on the reactivity of amylase.



Things to consider:
What equipment will you use?
Water bath
Amylase
Starch
Boiling tube

What range of temperature will you investigate?

i.e between 10°C- 50°C

At what intervals will you carry out your experiment?
i.e *'I will investigate the temperatures between 10°C- 50°C at 10°C intervals.*

This means you will investigate the following temperature: 10°C, 20°C, 30v, 40°C and 50°C.

Method- making the method reliable

-You must repeat your experiments at least 3 times.
-Control variables- using the same volumes. i.e same volumes of starch and amylase for each temperature, using the same concentration of amylase.

How will you present the data?
When drawing the table of results, do not forget that the independent variable goes in the left column whilst the dependent variable goes int the right column. ***The units must always be included and written in brackets.***

	Time taken until there is no starch present in the sample (mins)			
Temperature (°C)	Trial 1	Trial 2	Trial 3	Mean
10				
20				
30				
40				
50				

Skills guide – Graph skills

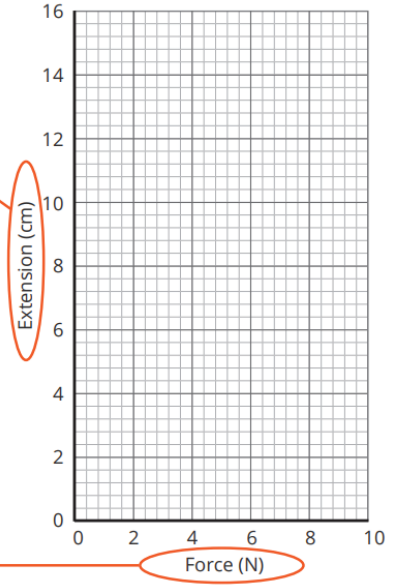
Using Data to Draw a Graph

The table below shows some data collected in a Hooke's law investigation.

The dependent variable (the value of which is measured for each change in the independent variable) goes on the y-axis.

Force (N)	Extension (cm)
0	0
2	4
4	8
6	11
8	13
10	14

The independent variable (the values of which are changed or chosen by the investigator) goes on the x-axis.

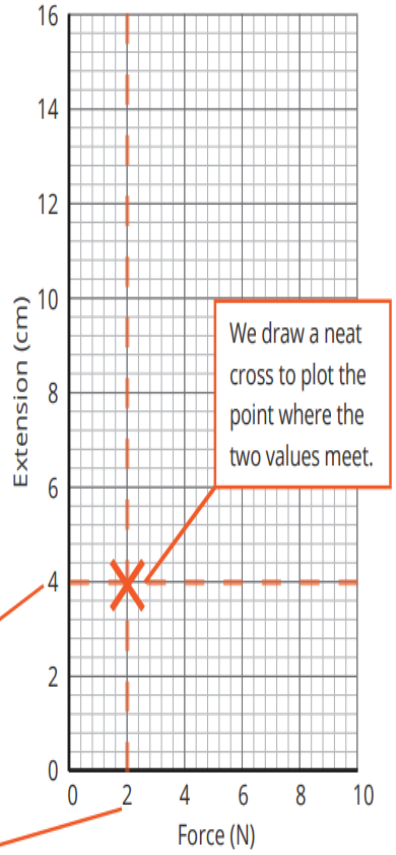


Force (N)	Extension (cm)
0	0
2	4
4	8
6	11
8	13
10	14

This row tells us that when a force of **2N** is applied to the spring, the extension is **4cm.**

The value on the y-axis is 4cm.

The value on the x-axis is 2N.

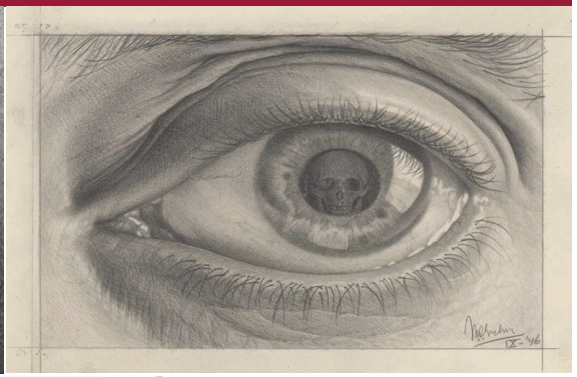


Year 9 Portraiture | Knowledge Organiser

AO1: RESEARCH (ARTISTS & IMAGE)

How to draw and observe within a convex and concave mirror using tonal range.

What is the illusion in this Portrait?



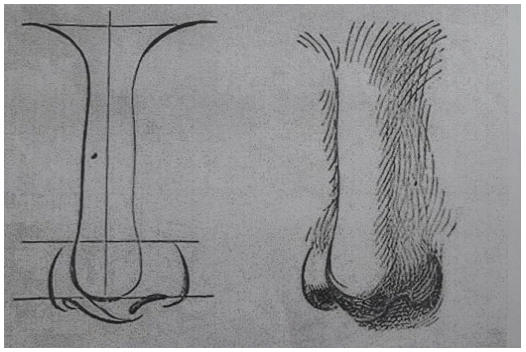
1

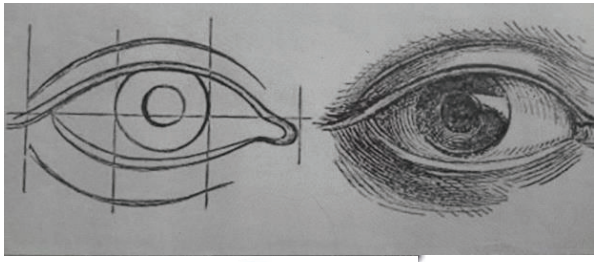
AO2: EXPERIMENTS WITH MEDIA

2

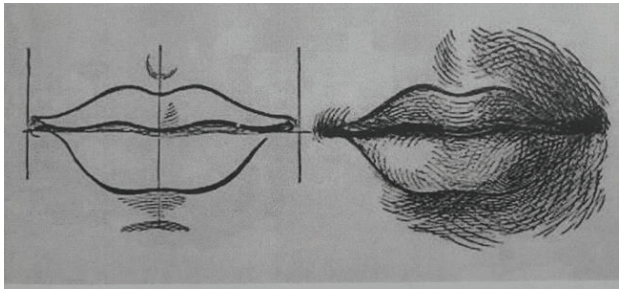
What is the message behind Escher's work?

Experimenting and expanding drawing knowledge with charcoal

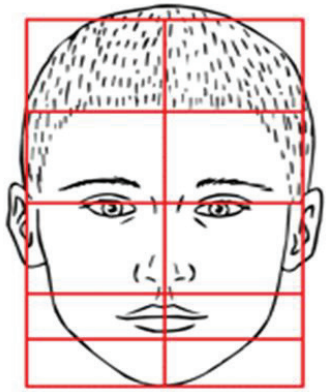


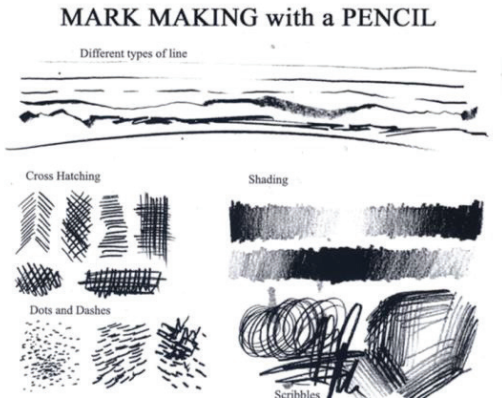


How do you build tone to create form?



Recording using shape, and size to be proportionally accurate in a portrait.

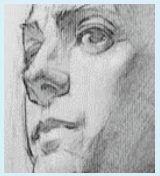
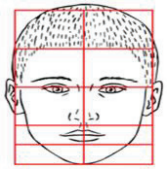




Art | Botanical Art |Topic Dictionary

Image	Word	Definition	In a sentence...
	**cross-hatching**	Cross-hatching is the layering of multiple lines to achieve tone. Artists draw in the direction of the shape they are drawing to achieve a realistic and lifelike appearance. The more layers you use the darker the tone achieved. Notice the curved lines in the folds of skin and lighter areas that have no lines.	I could improve my control of **cross hatching** to create marks that are closer together creating darker areas, adding to the illusion of a 3D form.
	**composition**	A portrait's composition is the sum of how you place all the parts within it: use of the edges of the frame, use of shapes within the frame, the prominence of any foreground/background details, the position of the subject within the frame, even the shape of the frame itself.	Within the **composition i**n Parmigianino's portrait the artist is playing with illusion through compositional tricks.
	**depth**	The illusion of space / solidity. Using tone in your allows you to create pictorial depth or space .	I have observed **depth** of tone using my 2B lead pencil, to show the mid and dark tones in my recording of the facial features.
	**form**	In relation to art the term form has two meanings: it can refer to the overall form taken by the work – its physical nature; or within a work of art it can refer to the element of shape among the various elements that make up a work	I have observed shape and **form** in my drawing of the nose, however my tone needs greater depth and variation to improve the 3D appearance of the **form**.
	**line**	Lines that are used to define the shape or form of an object or a figure, or to highlight key details of an image are called contour lines (or outlines).	I have used a soft use of **line** in mapping out my portrait and in my observation of the facial features.
	**mood**	Mood is the atmosphere in a painting, or the feeling expressed. Is the art tranquil, or is it dark and disturbing? Tone refers to the lightness or darkness of colours used, which can help to create a sense of depth or distance in art. Artists use light and dark colours to convey a mood or an emotion.	The **mood** of the piece is dark and subdued, due to its dark colour palettes and exaggerated features.

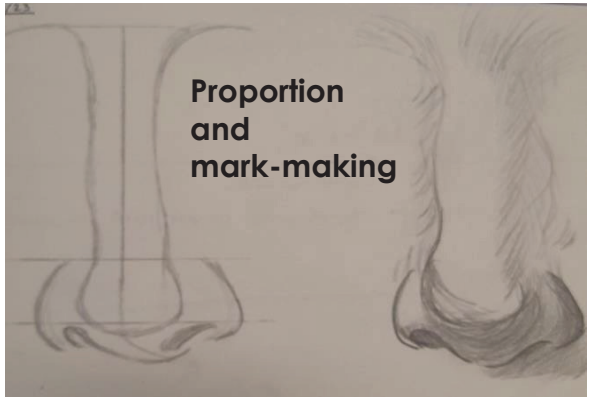
Art | Botanical Art |Topic Dictionary

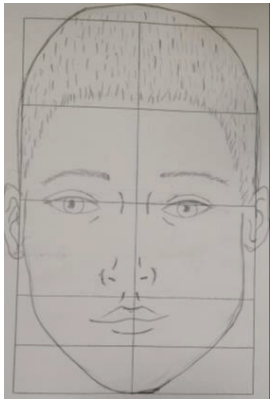
Image	Word	Definition	In a sentence...
	**perspective**	Perspective helps create the illusion of realism, space and depth in a two-dimensional work. It allows artists to create more lifelike images that appear three-dimensional. Ultimately, this enhances viewer engagement by drawing them into the painting, creating a more immersive experience.	have observed and used **perspective** in my recording of a portrait to create a 3D appearance observing shape and form.
	**proportion**	Proportion refers to the dimensions of a composition and relationships between height, width and depth. How proportion is used will affect how realistic or stylised. something seems. Proportion also describes how the sizes of different parts of a piece of art or design relate to each other.	I have observed accurate **proportion** of the size and shape of the head with accompanying features.
	**scale**	Scaling is the process of adjusting proportions and dimensions, is pivotal in pencil portrait drawing. It ensures that the final artwork accurately represents the subject, capturing facial features and expressions with precision.	I have a proportional representation of a human head to **scale.**
	**shape**	Shape is an area enclosed by a line. It could be just an outline, or it could be shaded in. Shapes can be geometric or irregular.	In my drawings of the facial features II have recorded a good use of varied **shape** with a soft and controlled use of line.
	**symmetry**	To be equal on both sides. You'll see both sides of your face are pretty symmetrical. This is known as bilateral symmetry and it's where both sides either side of this dividing line appear more or less the same.	have observed a good use of **symmetry** in my proportional drawing of the portrait with even tone.
	**tone**	This refers to the lightness or darkness of something. This could be a shade or how dark or light a colour appears. Tones are created by the way light falls on a 3D object. The parts of the object on which the light is strongest are called **highlights** and the darker areas are called **shadows.**	I am developing my application of **tone** in my observation of the face, using the rubber to create light areas against varied **tone.**

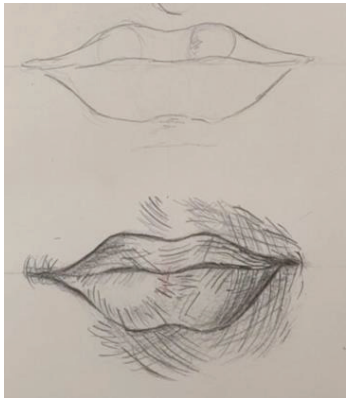
Skills Guide: AO3 Recording Observations: Exemplars

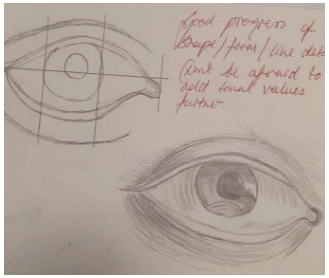


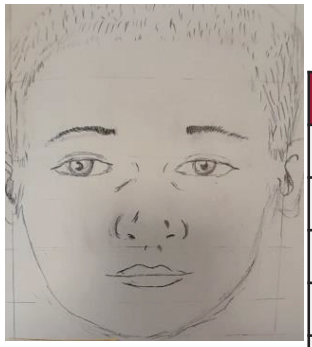
Shape, line, proportion and tone











Pencil : Graphite, soft hard tone, tonal range, dark, medium, light shadows/highlights, blending in shading contrast.

Tonal range using expressive charcoal with control.

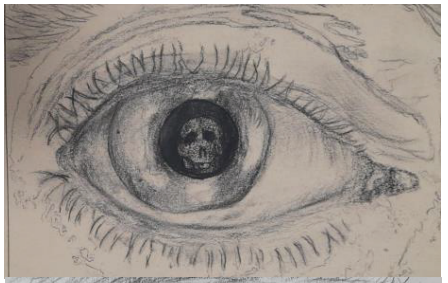
LINE

TONE

TEXTURE

SHAPE

FORM



Accurate recording of mark-making

As a Year 9 Artist I can…	
I can use tone to create light and shade in my observations.	
I can use a soft use of line to show shape with proportion.	
I can use mark-making to create tone and form.	
I can describe the main features of an artists work.	
I can respond to the features used in the work of others and describe them fully, with perceptive ideas.	
I can reflect and annotate my own work with next steps.	

AO3: RECORDING OBSERVATIONS (Evidence) Record ideas, observations and insights relevant to intentions as work progresses.
I can visually adapt and improve my work combining and organising ideas showing outstanding recording with a high level of observation.
I can observe with attention to detail and skill with adequate effect and annotation that records insights with ideas fully explained.
I can observe and record from life/ resources with some skill and annotate in my own words with clear explanations.
I can record limited ideas and annotate in my own words, showing some confidence emerging with observations.
I can record to a basic level from resources with some key-terms.

French | My city | Topic Dictionary

Image	Key Word	Definition	In a Sentence
	une bibliothèque	A library	Dans mon collège, il y a **une bibliothèque.**
	un centre commercial	A Shopping centre	Dans ma ville il y a **un centre commercial** modèrne.
	un cinéma	A cinema	**Le cinema** est en face de la piscine.
	un hôpital	A hospital	Dans ma ville il n'y a pas d' **hôpital.**
	Un stade	A stadium	J'aime visiter **le stade** avec mon copain.
	une librairie	A book shop	Il n'y a pas de **librairie** dans ma ville.
	une boulangerie	A bakery	Dans ma ville il y a **une** petite **boulangerie.**
	un parc	A park	Il y a **un parc** fantastique.
	un magasin	A shop	Il y a **un** petit **magasin**.
	un supermarché	A supermarket	Où-est **le supermarché, s'il vous plaît?**?
	une gare	A train station	Où-est **la gare, s'il vous plaît?**

French | My city | KO

Check for knowledge:

- ❑ I can say where I live (Step 1)
- ❑ I can describe my city (Step 1+2)
- ❑ I can give opinions on my local area (Step 2 + 3)
- ❑ I can use more complex ph rases in my writing. (Step 4)

Step 1: Saying where you live

J'habite à Londres	*I live in London*
J'habite en Angleterre	*I live in England*
On habite	*We live*
Une ville	*A town/city*
Une maison	*A house*
Un appartement	*A flat/apartment*
Avec ma famille	*With my family*

Step 2: Describing your city

Dans ma ville il y a	*In my city there is*
Dans ma ville il n'y a pas de	*In my city there isn't*
Ma ville est… / n'est pas…	*My city is/isn't*
Dans ma ville on peut…	*In my city you can*

Un parc	A park	**Faire du shopping**	To go shopping
Un supermarché	A supermarket	**Faire du sport**	To do sport
Un cinéma	A cinema	**Manger au restaurant**	To eat in a restaurant
Un hôpital	A hospital	**Regarder un film**	To watch a film
Un centre commercial	A shopping centre	**Prendre des photos**	To take photos

Step 3: Giving opinions

Je pense que	*I think that*
Je dirais que	*I would say that*
À mon avis	*In my opinion*
Ma ville est	*My city is…*

grand(e)	*big*	***intéressant(e)***	*interesting*
petit(e)	*small*	***barbant(e)***	*boring*
amusant(e)	*fun*	***passionant(e)***	*exciting*
divertissant(e)	*entertaining*	***fantastique***	*fantastic*
affreux(se)	*awful*	***terrible***	*terrible*
historique	*historic*	***propre***	*clean*
sale	*dirty*	***moderne***	*modern*

Step 4: Elevate your sentences with connectives

aussi	*Also*
en plus	*In addition*
mais	*but*
et	*and*
ou	*Or*
où	*Where*
cependant	*However*
Par contre	on the other hand

French | My city | Skills Guide

Have you used…

1. a verb?	2. a noun?	3. a connective?	4. a complex phrase?	5. a noun?
Dans ma ville il y a (In my town/city there is) **Dans mon quartier il y a** (In my neighbourhood) **Dans ma banlieue il y a** (In my suburb there is)	**un cinéma**(a cinema) centre) **une pisicine** (a pool) **un hôpital** (a hospital) **une boulangerie** (a bakery) **une église** (a church) **un hôtel de ville** (a town hall) **des magasins** (some shops) **un centre commercial** (a shopping		**il n'y a pas de** (there is not) **si c'était posible, je préférerais avoir** (if it were possible, I would prefer to have) **je voudrais avoir** (I would like to have)	**un cinéma**(a cinema) **un centre commercial** (a shopping centre) **une pisicine** (a pool) **un hôpital** (a hospital) **une boulangerie** (a bakery) **une église** (a church) **un hôtel de ville** (a town hall) **des magasins** (some shops)
Dans ma ville on peut (In my town you can) **Dans mon quartier on peut** (In my neighbourhood you can) **Dans ma banlieue on peut** (In my suburb you can)	**faire du shopping** (do shopping) **faire du sport** (do sport) **aller au cinema** (go to the cinema) **visiter le musée** (visit the musuem) **faire de la randonnée** (go hiking) **sortir avec des amis** (go out with friends) **Example:** Dans ma ville il y a un cinema mais on ne peut pas faire de la randonnée. (In my city there is a cinema but you cannot go hiking)/	**mais** (but) **et** (and) **cependant** (however) **par contre** (on the other hand)	**on ne peut pas** (you cannot) **si c'était posible, je préférerais** (if it were possible, I would prefer) **je voudrais** (I would like)	**faire du shopping** (do shopping) **faire du sport** (do sport) **aller au cinema** (go to the cinema) **visiter le musée** (visit the musuem) **faire de la randonnée** (go hiking) **sortir avec des amis** (go out with friends)

French | My city | Skills Guide

Success Criteria:

Have you **introduced yourself**?

- ❑ Can you describe **where** you live?
- ❑ **Who** do you live with?
- ❑ Can you describe your **house?** Have you used a variety of **adjectives?** Could you add an **intensifier**?
- ❑ Can you describe **your local area?** Have you included a range of **nouns?**
- ❑ Can you include where you **would like** to live? Have you used any **complex structures?**

Simple answer:

Bonjour, je m'appelle Erica et j'habite dans une petite maison avec mes parents dans une ville qui s'appelle Londres. J'aime ma ville parce que c'est très intéressant. Dans ma ville il y a un cinéma et un centre commercial. Cependant, il n'y a pas de parc.

Extended answer:

Bonjour, je m'appelle Erica et j'ai dix ans. J'habite avec ma famille dans un appartment dans le centre-ville. Dans ma ville il y a beaucoup à faire. On peut visiter le parc où il y a des magasins assez intéressants. J'aime ma ville mais c'est un peu sale. Donc, je voudrais habiter à la campagne parce que c'est plus relaxant.

Connectives used to link ideas

Variety of **adjectives**

Intensifiers used to add detail

Fancy phrase used to upgrade answer.

French | Environmental problems | Topic Dictionary

Image	Key Word	Definition	In a Sentence
	l'environnement	the environment	Je m'inquiète beaucoup pour **l'environnement.**
	le climat	the climate	**Le climat** est touché par la circulation.
	la planète / la terre	the planet /the earth	**La planète** est en danger.
	la pollution	the pollution	Il faut organiser des manifestations contre **la pollution**.
	la circulation	the traffic	L'environnement est menacé par **la circulation.**
	la sécheresse	the drought	**La sécheresse** est le problème le plus important.
	les déchets / les ordures	the rubbish	On doit jeter **les déchets / les ordures** dans la poubelle.
	les inondations	the flooding	Dans mon pays, il y a beaucoup d' **inondations.**
	le changement climatique	the climate change	Comment s'organiser face au **changement climatique**?
	le réchauffement de la planète	the global warming	On peut arrêter **le réchauffement de la planète.**
	les animaux en danger	the animals in danger	Partout dans le monde **les animaux sont en danger** de disparition.

French | Solutions | Topic Dictionary

Image	Key Word	Definition	In a Sentence
	pour aider la planète	to help the planet	**Pour aider la planète**, on doit recycler plus.
	c'est nécessaire de reduire la pollution	It is necessary to reduce pollution	Pour sauver la planète, **c'est nécessaire de reduire la pollution.**
	je recycle plus	I recycle more	En ce moment, **Je recycle plus** et surtout le plastique.
	je trie mes déchets	I sort my rubbish	Tous les jours, **je trie mes déchets** pour sauver la planète.
	je protège la planète	I protect the planet	**Je protège la planète** en étant végétarien.
	je réutilise les sacs en plastique	I reuse plastic bags	Je protège la planète car **je réutilise les sacs en plastique.**
	j'achète des produits verts	I buy green products	Ma famille et moi, on **achète** toujours **des produits verts**.
	j'utilise les transports en commun	I use public transport	Pour aller au collège, **j'utilise les transports en commun**.
	je marche plus souvent	I walk more often	**Je marche plus souvent** pour réduire la pollution.
	je fais du bénévolat	I volunteer	Pour aider les gens, **je fais du benevolat.**

French | Environmental and Social Issues | KO

Check for knowledge:

- ❑ I can say what worries me (Steps 1+4)
- ❑ I can talk about problems and give solutions (Steps 1-4)
- ❑ I can give justified opinions (Step 1-4)
- ❑ I can use a range of time markers (Step 4)

Step 1: Say what worries you

Le plus grand problème		The biggest problem	
Ce qui m'inquiète		What worries me	
Maintenant, j'utilise / je fais / je vais		Now, I use / I do / I go	
Il y a des déchets partout		*There are rubbish everywhere*	
Les effets du changement climatique		*The* effects of climate change	
Les gens pensent que	*People think that*	**La destruction**	destruction
Lutter contre	Fight against	**La menace**	threat
Le recyclage	rcycling	**S'organiser**	To get organised
La protéction	protection	**En étant**	*By being*

Step 2: Talk about social issues

J'aide		I help	
Il faut aider		You must help	
Les gens	*people*	**Les sans abris**	*homeless*
La faim	*hunger*	**Le / la bénévole**	*volunteer*
La guerre	*war*	**Au chômage**	*unemployed*
La violence	*violence*	**La société**	*society*

Step 3: Giving solutions

Je fais beaucoup pour	*I do a lot to*
Pour sauver la planète	*To save the planet*
Pour protéger l'environnement	*To protect the environment*
On peut changer le monde	*We can change the world*
On peut améliorer la situation	*We can improve the situation*
Organiser des manifestations	*To organise protests*
Je fais de mon mieux	*I do my best*
J'ai l'intention de	*I intend to*

Step 4: Elevate your sentences with time markers

Maintenant	now
En ce moment	Right now.
Tous les jours	Every day
Pendant le weekend	At the weekend
La semaine dernière	Last week
L'année dernière	Last year
Récemment	recently
A l'avenir	In the future

French | Environment | KO

Have you used?

1. a time marker?	2 . a sentence starter?		3. a noun?	4. a connective?	5. reason?	6. a negative form?	7. a solution?	
En ce moment (At the moment) **Actuellement** (At the moment) **De nos jours** (Nowadays)	**le problème le plus important** (the most important problem)	**c'est** (is)	**la pollution** (pollution) **la circulation** (traffic) **les sacs en plastique** (plastic bags) **les papiers dans la rue** (papers on the street) **les déchets** (rubbish)	**car** (because) **parce qu'** (because) **puisqu'** (because / since) **étant donné qu'** (because)	**il y a (there is)** **trop de voitures dans la rue** (too many cars in the street) **trop de pollution dans les océans à cause du plastique.** (too much pollution in the oceans because of the plastic)	**il n'y a pas (assez) de (there isn't) (enough)** **centres de recyclage** (recycling centres) **poubelles** (bins) **transports en commun** (public transports)	**On doit** (we must) **On devrait** (we should) **On peut** (we can) **On pourrait** (we could) **Il faut** (you must) **Il faudrait** (you should)	**recycler plus.** (recycle(d) more) **utiliser les transports en commun.** (use(d) public transports) **marcher plus souvent.** (walk(ed) more often) **construire plus de centres de recyclage.** (build (built) more recycling centres) **utiliser plus de sacs pour la vie** (use(d) bags for life) **avoir plus de poubelles dans les rues** (have (had) more bins in the streets)
Past tense **Quand j'étais petite** (When I was little) **Quand j'étais jeune** (When I was young) **Quand j'avais 10 ans** (When I was 10)		**c'était** (was)			**il y avait (there was)** **trop de voitures dans la rue** (too many cars in the street) **trop de pollution dans les océans à cause du plastique.** (too much pollution in the oceans because of the plastic)	**il n'y avait pas (assez) de (there wasn't) (enough)** **centres de recyclage** (recycling centres) **poubelles** (bins) **transports en commun** (public transports)	**On aurait dû** (we should have) **On aurait pu** (we could have) **Il aurait fallu** (we should have)	

Example: En ce moment, le probleme le plus important c'est la circulation car il y a beacoup de voitures. On devrait marcher plus. Souvent.

(At the moment, the biggest problem is traffic because there are too many cars. We should walk more often.

French | Environment | Skills Guide

Success Criteria:

- ❑ Can you talk about environmental problems?
- ❑ Can you give **opinions** and **reasons** about **the environment?** Have you used the correct **word order** and **adjective endings**?
- ❑ Can you suggest **solutions**? Can you use justified opinions?
- ❑ Can you add another tense and time markers? Could you add an **intensifier**?

Simple answer:

Je m'intéresse beaucoup à l'environnement et j'adore aussi la nature. Dans ma ville, il y a beaucoup de pollution. J'essaie de recycler les déchets et j'utilise les transports publics. Je pense qu'on doit recycler plus.

Connectives used to link ideas

Intensifiers used to add detail

Fancy phrases to elevate your work

Time marker

Extended answer:

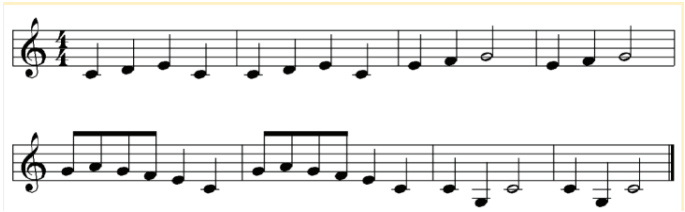
Opinion phrases used to upgrade answer.

Je m'intéresse beaucoup à l'environnement et j'adore aussi a nature. Je dirais que dans ma ville, il y a beaucoup de pollution. A mon avis, protéger l'environnement est très important. J'essaie de recycler, quand je peux, les déchets, le verre et le plastique et en plus, j'utilise les transports publics. Chaque personne doit faire un effort pour sauver la planète. A l'avenir j'ai l'intention de faire du bénévolat pour une association qui aide les personnes qui vivent dans la rue.

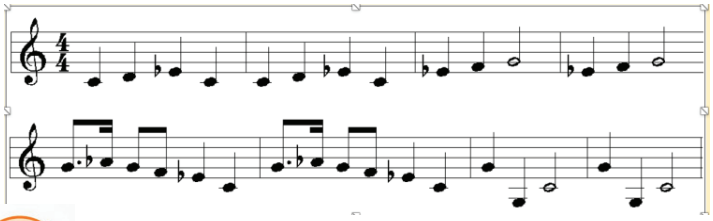
Variations form | Skills guide |

Variation form is based on the theme (below) and a set of variations on that theme. Here is a quick guide to performing and composing a set of variations:

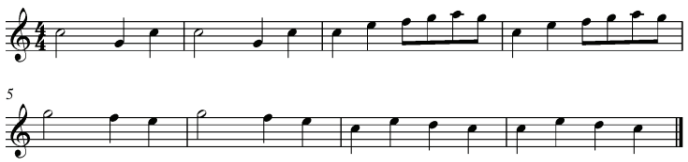
1 The theme is the unchanged, original version of the tune/melody.



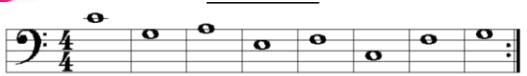
2 Next, play the theme in the **minor key** by changing each E to Eb and A to Ab. This type of variation involves changing the **tonality** from **major** to **minor.** Notice that the rhythm has also become dotted in bars 5 and 6. Can you spot any other small changes?



3 Here is the music in r**etrograde** form (backwards)

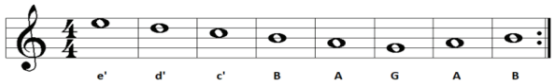


4 Another type of variation is **ground bass.** Pachelbel wrote this famous piece in about 1680

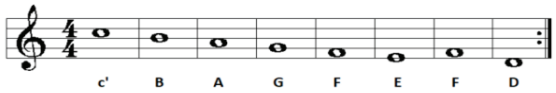


Each time the ground bass repeats a new, varied layer is added over the top:

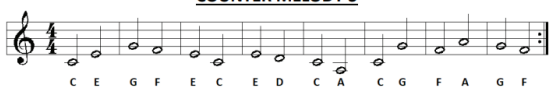
COUNTER MELODY 1



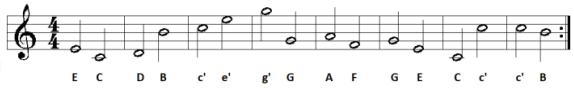
COUNTER MELODY 2



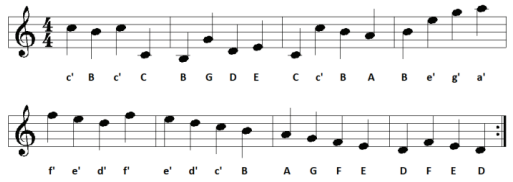
COUNTER MELODY 3



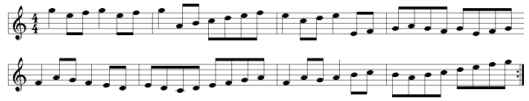
COUNTER MELODY 4



COUNTER MELODY 5



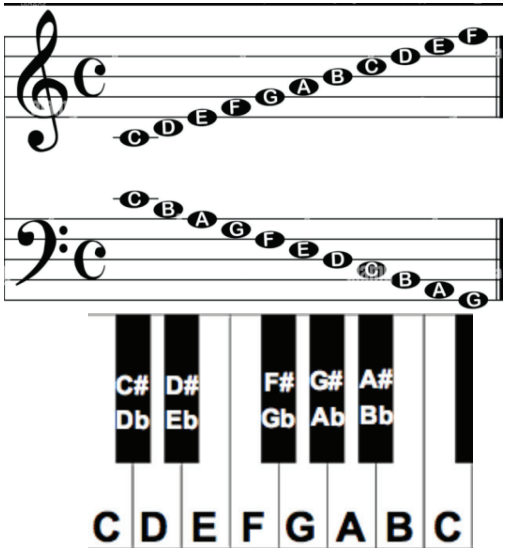
COUNTER MELODY 6 (Stretch and Challenge)



5 Composing task: Using EITHER Frere Jacques OR Pachelbel's canon, **compose** your own set of variations/ground bass variations
Use the following ideas or create your own!

1) Adding or taking away notes
2) Changing notes or rhythm
3) Changing the instrumentation
4) Playing in canon (as a round)
5) Changing the structure

Notes guide: Use this to help you read the notated scores



Skills Guide | What will I be assessed on in Music?

Practising and Performing

This is your opportunity to show that you can **sing/play** a simple theme that you have learnt in front of your teacher and peers on the keyboard or Ukelele. You will need to think carefully about what makes a successful and convincing performance! Below are some things to consider:

Performing skills: You will learn to perform as
- A whole class
- In groups
- As a soloist

You should try to perform with:
- Accuracy
- Fluency
- Expression (Dynamics, articulation,
- phrasing, sense of ensemble)
- A sense of style

Rehearsing skills: You will learn to
- Work independently
- Set up your equipment and space swiftly and safely
- Organise your time effectively
- Listen to and support people in your group
- Respond to feedback, setting goals for improvement
- Evaluate yours and others' work using key words

Composing and arranging

Composing means **creating** music from scratch. When you compose a set of variations based on a given theme you must be sparing with your ideas (don't get too complicated). Once you have mastered the technique in each variation you can get really creative!

Composing and arranging skills: You will learn to create a set of at least two variations on a given theme
During the creation process you will consider:

How you can vary the theme using

Change of tonality (major to minor)
Melodic alteration
Rhythmic alteration
Retrograde
Passing notes

You will also consider how musical elements such as melody, rhythm and tempo are combined in your creation.

Listening to and identifying music

You need to listen to a set of variations and spot the changes from the original theme. You will use the skills you have mastered in the performing and composing element of the course to recognize the same techniques in a range of classical and popular pieces

Listening skills: You will learn to use your listening skills during independent practice/ rehearsal sessions to monitor your strengths and areas for development. Your ears are your most important tool and you will need to listen critically every time you play your instrument.

Is your Keyboard-playing in time and are you playing each note with an even tone so that all the keys go down together at the same time?

Is your percussion part in time?

Is the balance correct in your performance?

Finally, can you hear the difference between each of the variations and between major and minor tonalities?

Exploring your **thinking**

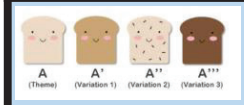
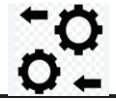
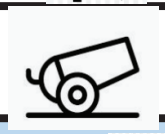
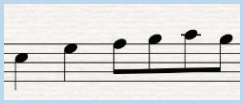
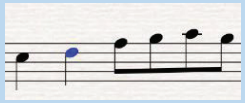
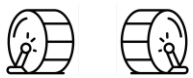
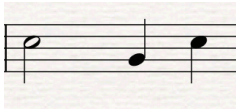
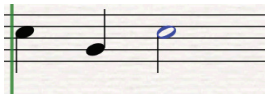
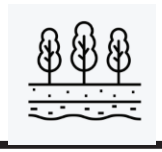
Learning about theme and variations is important because it helps us to understand how much music can be generated using a simple starting point.

Exploring and researching skills: You will explore a range of different pieces from different periods in music history, all of which use theme and variations. You will explore the difference between variations and describe these using key terms from year 7. 8 and 9 as well as new words from this term. You will be tested on your ability to describe what you hear using words from the glossary, expressing your opinion about whether you think the music is successful and why.

Examples are:

Pachelbel's canon
Rachmaninov Rhapsody on a theme of Paganini
Mozart Ah je vous dirai maman

Variations form | |Topic Dictionary

Image	Key term	Definition	In a sentence…
	**Variation form**	A type of structure in music in which the music is all based on a main melody or theme	Benjamin Britten wrote some **Variations** on the theme of Purcell called "The Young person's guide to the orchestra"
	**Theme**	The main, original version of the melody, upon which the variations are based	Mozart wrote a set of variations on the **theme** of "Twinkle, twinkle little star"
	**Tonality**	Major or minor	This term you will learn how to change the **tonality** of a theme from major to minor by varying a few notes
	**Retrograde**	Backwards	When a theme is played backwards it is **retrograde**
	**Canon**	When one part starts and the other joins in with the same tune later	A **Canon** is also known as a "Round"
	**Alteration (melodic)**	 	**Melodic alteration** happens when you change or vary one or two notes of the theme
	**Alteration (rhythmic)**	 	**Rhythmic alteration** happens when you change or vary one or two notes of the rhythm
	**Passing notes**	In-between or "stepping stone" notes	**Passing notes** happen when you add notes in between gaps in the theme
	**Ground Bass**	The bass line upon which each variation is layered	Pachelbel wrote a famous piece using a **ground bass**, that repeated over and over again with more and more layers over the top

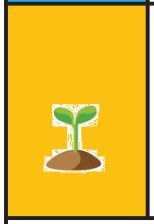
Music | Variations | Assessing Progress

Developing my skills in Music

- ❑ I can play the theme and variations CONFIDENTLY and with EXPRESSION on my instrument
- ❑ I can compose at least two variations using a range of techniques such as change of tonality, passing notes, rhythmic and melodic alteration and retrograde

- ❑ I can play the theme and variations with some accuracy and fluency on my instrument
- ❑ I can compose at least two variations using a range of techniques such as change of tonality and canon

- ❑ I can play the theme and part of a variation on my instrument
- ❑ I can compose at least one variation using a change of tonality
- ❑ I am gaining confidence but are not fluent yet



- ❑ I can play the theme with some help
- ❑ I can compose a very simple variation using a drone or change of tonality.
- ❑ I need help to get started

This is where you and your teacher can agree on a personalised target. This could include:

- ❑ Performing a solo in front of the class
- ❑ Composing an extended piece using music software
- ❑ Presenting some research on variation form to the class

As a year 9 musician I know how to:	
Perform an entire theme using notation/from memory	DATE
Work independently in groups to compose a set of variations	DATE
Recognise all the notes of the keyboard	DATE
Identify variation techniques such as change of tonality, melodic/rhythmic alteration, passing note, canon, retrograde, drone	DATE
Evaluate own and others' work and respond to feedback positively	DATE
Identify sections of a popular song as Intro/Verse/chorus/Middle 8/ outro	DATE

Spanish | Environmental problems | Topic Dictionary

Image	Key Word	Definition	In a Sentence
	**el medio ambiente**	the environment	Estoy muy preocupado por **el medio ambiente.**
	**el clima**	the climate	**El clima** se ve afectado por el tráfico.
	**el planeta / la tierra**	the planet /the earth	**El planeta** está en peligro.
	**la polución/la contaminacion**	the pollution	Hay que organizar manifestaciones contra **la contaminación**
	**el tráfico**	the traffic	El medio ambiente está amenazado por **el tráfico.**
	**la sequía**	the drought	**La sequía** es el problema más importante.
	**la basura**	the rubbish	Debemos tirar **la basura** en el basurero
	**las inundaciones**	the flooding	En mi país, hay muchas **inundaciones**
	**el cambio climático**	the climate change	¿Cómo organizarse frente al **cambio climático**?
	**el calentamiento global**	the global warming	Podemos detener el **calentamiento global.**
	**los animales en peligro**	the animals in danger	En todo el mundo, **los animales están en peligro** de extinción.

Spanish | Solutions | Topic Dictionary

Image	Key Word	Definition	In a Sentence
	**Para ayudar al planeta**	to help the planet	**Para ayudar al planeta**, debemos reciclar más
	**Es necesario reducir la contaminación**	It is necessary to reduce pollution	Para salvar el planeta, **es necesario reducir la contaminación**.
	**Reciclo más**	I recycle more	Actualmente, estoy reciclando más, especialmente el plástico.
	**Separo la basura**	I sort the rubbish	Todos los días **separo la basura** para salvar el planeta.
	**Cuido el planeta**	I protect the planet	**Cuido el planeta** siendo vegetariano**.**
	**Reutilizo las bolsas de plástico**	I reuse plastic bags	Protejo el planeta **reutilizando bolsas de plástico.**
	**Compro productos ecológicos / verdes**	I buy green products	Mi familia y yo siempre **compramos productos ecológicos/ verdes**
	**Uso el transporte público**	I use public transport	Para ir al colegio, **uso el transporte público.**
	**Camino más seguido**	I walk more often	**Camino más seguido** para reducir la contaminación.
	**Soy voluntario**	I volunteer	Para ayudar a la gente, **soy voluntario**.

Spanish | Environment | KO

Adverbs of frequency	Activities	…because it is important…	Justification
Siempre (always) **Todos los días** (every day) **A diario** (every day) **Cada día** (every day) **Cada mañana** (every morning) **A menudo** (often) **A veces** (at times) **De vez en cuando** (sometimes) **Raramente** (rarely) **Casi nunca** (almost never) **Nunca** (never)	**reciclo en casa** (I recycle at home) **reutilizo las bolsas de plástico** (I reuse plastic bags) **apago las luces** (I switch off the lights) **desconecto aparatos inactivos** (I disconnect inactive devices) **uso mi bici** (I use my bike) **uso el transporte público** (I use public transport) **camino** (I walk) **tomo una ducha en lugar de un baño** (I have a shower instead of a bath) **separo la basura**(I separate the rubbish) **utilizo bombillas ecológicas** (I use energy saving lightbulbs) **compro productos locales** (I buy local products) **compro productos orgánicos** (I buy organic products) **protesto en un grupo ecológico** (I protest in a green group)	**...porque es importante…** (because it is important) **…dado que es esencial…** (given that it is essential) **…ya que es imprescindible…** (since it is essential)	**ahorrar energía** (to save energy) **ahorrar agua** (to save water) **no malgastar energía** (to not waste energy) **no malgastar agua** (to not waste water) **no malgastar nuestros recursos naturales** (to not waste our natural resources) **proteger el medio ambiente** (to protect the environment) **cuidar** el planeta (to look after the planet) **no dañar** el medio ambiente (not to harm the environment)

Example: A menudo, separo la basura dado que es esencial protéger el medio ambiente.

(Often, I separate the rubbish given that it is essential to protect the environement

Spanish | Environmental and Social Issues | KO

Check for knowledge:

- ❑ **I can say what worries me (Steps 1+4)**
- ❑ **I can talk about problems and give solutions (Steps 1-4)**
- ❑ **I can give justified opinions (Step 1-4)**
- ❑ **I can use a range of time markers (Step 4)**

Step 1: Say what worries you

el mayor problema	The biggest problem
Lo que me preocupa	What worries me
Ahora estoy usando / estoy haciendo / voy a	Now, I use / I do / I go
Hay basura por todas partes	*There are rubbish everywhere*
Los efectos del cambio climático	*The* effects of climate change

La gente piensa que	*People think that*	**la destrucción**	destruction
Luchar contra	Fight against	**la amenaza**	threat
el reciclaje	rcycling	**organizarse**	To get organised
la protección	protection	**estando**	*By being*

Step 2: Talk about social issues

ayudo		I help	
Hay que ayudar		You must help	
La gente	*people*	Es sin hogar	*homeless*
El hambre	*hunger*	El / la voluntario/a.	*volunteer*
La guerra	*war*	**En el paro**	*unemployed*
La violencia	*violence*	La sociedad	*society*

Step 3: Giving solutions

Hago mucho para	I do a lot to
Para salvar el planeta	To save the planet
Para proteger el medio ambiente	To protect the environment
Podemos cambiar el mundo	We can change the world
Podemos mejorar la situación	We can improve the situation
Organizar manifestaciones	To organise protests
Hago lo mejor que puedo	I do my best
Tengo la intención de	I intend to

Step 4: Elevate your sentences with time markers

Ahora	Now
En este momento	Right now
Todos los dias	Every day
Durante el fin de semana	During the weekend
La semana pasada	Last week
El año pasado	Last year
Recientemente	recently
En el futuro	In the future

Spanish | Environment | Skills Guide

Success Criteria:

- ❑ Can you talk about environmental problems?
- ❑ Can you give **opinions** and **reasons** about **the environment?** Have you used the correct **word order** and **adjective endings**?
- ❑ Can you suggest **solutions**? Can you use justified opinions?
- ❑ Can you add another tense and time markers? Could you add an **intensifier**?

Simple answer:

Me interesa mucho el medio ambiente y también me gusta la naturaleza. En mi ciudad hay mucha contaminación. Intento reciclar residuos y utilizar el transporte público. Creo que necesitamos reciclar más.

Connectives used to link ideas

Intensifiers used to add detail

Fancy phrases to elevate your work

Time marker

Opinion phrases used to upgrade answer.

Extended answer:

Me interesa mucho el medio ambiente y también me gusta la naturaleza. Yo diría que en mi ciudad hay mucha contaminación. En mi opinión proteger el medio ambiente es importante. Intento reciclar, cuando puedo, residuos, vidrio y plástico y además uso el transporte público. Cada persona debe hacer un esfuerzo para salvar el planeta. En el futuro planeo ser voluntario en una asociación que ayuda a las personas que viven en la calle.

Spanish | My city | Topic Dictionary

Image	Key Word	Definition	In a Sentence
	**Una biblioteca**	A library	En mi insti hay **una biblioteca.**
	**un centro commercial**	a shopping centre	En mi pueblo, hay **un centro commercial grande.**
	**Un cine**	A cinema	**Un cine** está en mi ciudad.
	**Un hospital**	a hospital	En mi ciudad hay **un hospital.**
	**Un estadio**	A stadium	Me gusta visitar **un estadio** con mi amigo
	**Una librería**	A book shop	No hay **una librería** en mi pueblo.
	**Una pastelería**	A bakery	En mi ciudad hay **una panadería** excellente.
	**Un parque**	A park	Hay **un parque** fantástico.
	**Una tienda**	A shop	Hay **una tienda** pequeña.
	**un supermercado**	A supermarket	¿Dónde está **un supermercado**, por favor?
	**una estación de tren**	A train station	¿Dónde está **la estación de tren,** por favor?

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Have you used…

1. a verb?	2.)a noun?	3. a connective?	4. a complex phrase?	5. a noun?
En mi pueblo/ciudad hay (In my town/city there is) **En mi barrio hay** (In my neighbourhood there is)	**Un cine**(a cinema) **un centro commercial** (a shopping centre) **una pisicina** (a pool) **un hospital** (a hospital) **Una panadería** (a bakery) **Una iglesia** (a church) **un ayuntamiento** (a town hall) **Unas tiendas** (some shops)	**pero** (but) **Y** (and) **Sin embargo** (however)	**No hay** (there is not) **si fuera possible, preferiría tener** (if it were possible, I would prefer to have) **Me gustaría tener** (I would like to have)	**Un cine**(a cinema) **un centro commercial** (a shopping centre) **una pisicina** (a pool) **un hospital** (a hospital) **Una panadería** (a bakery) **Una iglesia** (a church) **un ayuntamiento** (a town hall) **Unas tiendas** (some shops)
En mi pueblo se puede (In my town you can) **En mi barrio hay** (In my neighbourhood you can)	**Ir de compras** (do shopping) **Hacer deporte** (do sport) **Ir al cine** (go to the cinema) **Visitar los museos** (visit the musuem) **Hacer senderismo** (go hiking) **Salir con amigos** (go out with friends)		**No se puede**(you cannot) **si fuera possible, preferiría** (if it were possible, I would prefer) **Me gustaría** (I would like)	**Ir de compras** (do shopping) **Hacer deporte** (do sport) **Ir al cine** (go to the cinema) **Visitar los museos** (visit the musuem) **Hacer senderismo** (go hiking) **Salir con amigos** (go out with friends)

Example: En mi ciudad hay un cine pero no se puede hacer senderismo.

(In my city there is a cinema but you cannot go hiking)/

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Check for knowledge:

- ❑ I can say where I live (Step 1)
- ❑ I can describe my city (Step 1+2)
- ❑ I can give opinions on my local area (Step 2 + 3)
- ❑ I can use more complex phrases in my writing. (Step 4)

Step 1: Saying where you live

Vivo en	*I live in*
Vivimos en	*We live in*
Un pueblo	*A town*
Una ciudad	*A city*
Una casa	*A house*
Un piso	*An apartment*
Con mi familia	*With my family*

Step 2: Describing your city

En mi ciudad hay		In my city there is	
En mi ciudad no hay		In my city there isn't	
Mi ciudad es/no es		My city is/isn't	
En mi ciudad se puede		In my city you can	
Un parque	A park	**Ir de compras**	Go shopping
Un supermercado	A supermarket	**Hacer deporte**	Do sport
Un cine	A cinema	**Comer en restaurantes**	Eat in restaurantes
Un hospital	A hospital	**Ver películas**	Watch films
Un centro commercial	A shopping centre	**Sacar fotos**	Take photos

Step 3: Giving opinions

Pienso que		*I think that*	
Diría que		*I would say that*	
En mi opinión		*In my opinion*	
(No) Es		*It is / It isn't*	
Grande	*big*	***Interesante***	*interesting*
pequeño	*Small*	***Aburrido***	*Boring*
Divertido	*Fun*	***Emocionante***	*Exciting*
Entretenido	*Entertaining*	***Fantástico***	*Fantastic*
Fatal	*Awful*	***Sucio -a***	*Dirty*
Histórico -a	*historic*	***Limpio -a***	*Clean*
Moderno -a	*modern*	**Viejo -a**	*Old*

Step 4: Elevate your sentences with connectives

También	*Also*
Además	*In addition*
Sin embargo	*However*
Pero	*but*
Y	*and*
O	*or*

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Success Criteria:

Have you **introduced yourself**?

- ❑ Can you describe **where** you live?
- ❑ Can you describe your **house?** Have you used a variety of **adjectives?** Could you add an **intensifier**?
- ❑ Can you describe **your local area?** Have you included a range of **nouns?**
- ❑ What was your area **like in the past?**
- ❑ Can you include where you **would like** to live? Have you used any **complex structures?**

Simple answer:

Hola, me llamo Érica y vivo en una casa grande con mis padres en una ciudad que se llama Londres. Me gusta mucho mi ciudad porque es muy interesante. En mi ciudad hay un cine y un centro commercial. Sin embargo, no hay parque.

Extended answer:

Hola, me llamo Érica y tengo diez años. Vivo con mi familia en un piso bonito en el centro de la ciudad. En mi ciudad, hay mucho que hacer como visitar el parque o hay unas tiendas bastante interesantes. Me gusta mi barrio pero es un poco sucio, pero en el pasado era muy limpio. Por lo tanto, me gustaría vivir en el campo porque es muy relajante.

Connectives used to link ideas

Variety of **adjectives**

Intensifiers used to add detail

Fancy phrase used to upgrade answer.


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