

Knowledge Organiser Booklet

Year 9 Spring Half Term 1

Ignorance is the curse
of God; knowledge is
the wing wherewith we
fly to heaven.




William Shakespeare


Name: _____ Teaching groups: _____

Contents

- Home learning timetable
- Instructions on how to use a knowledge organiser
- English
- Maths
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- Land Based
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Education
Endowment
Foundation



+5 months

Research carried out by the Education Endowment Foundation proved that: Homework has a positive impact on average of + 5 months, particularly with pupils in secondary schools.




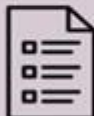




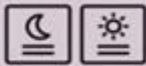









Home learning timetable

The table below details which days each subject will set home learning on each week. Students will have one week to complete home learning tasks for each subject.

	Monday	Tuesday	Wednesday	Thursday	Friday
All students	Reading +	Science 1	Maths	Science 2 Humanities	English
9K			Land Based		Animal Care
9M	Animal Care				Land Based
9C	Land Based		Animal Care		

These knowledge organisers have been created by your teachers to support your learning both in class and for home learning. They are also a valuable revision tool for you to use independently when preparing for assessments. It is important that you make good use of your knowledge organisers by learning how to use them in different ways.

How to use a knowledge organiser – step by step guide

	Look, Cover, Write, Check	Definitions of Key Words	Flash Cards	Self Quizzing	Mind Maps	Paired Retrieval
Step 1	<p>Look at and study a specific area of your KO.</p> 	<p>Write down the key words and definitions.</p> 	<p>Use your KO to condense and write down key facts or information onto flash cards.</p> 	<p>Use your KO to create a mini quiz. Write down your questions using your KO.</p> 	<p>Create a mind map with all the information you can remember from your KO.</p> 	<p>Ask a friend or family member to have the KO or flash cards in their hands.</p> 
Step 2	<p>Cover or flip the KO over and write down everything you can remember.</p> 	<p>Try not to use your KO to help you.</p> 	<p>Add pictures to help support. Then self-quiz using the flash cards. You could write questions on one side, and answers on the other!</p> 	<p>Answer the questions and remember to use full sentences.</p> 	<p>Check your KO to see if there are any mistakes on your mind map.</p> 	<p>They can test you by asking you questions on different sections of your KO.</p> 
Step 3	<p>Check what you have written down. Correct any mistakes in green pen and add anything you have missed. Repeat.</p> 	<p>Use your green pen to check your work.</p> 	<p>Ask a friend or family member to quiz you on the knowledge.</p> 	<p>Ask a friend or family member to quiz you using the questions.</p> 	<p>Try to make connections, linking the information together.</p> 	<p>Write down your answers,</p> 



3.1 – Find and List Questions

When you do a find and list question, that's exactly what you do – you find and you list information from the text.

Use the most simple, obvious answers possible in your answers.

EXAMPLE TEXT: “She was never able to mind her own business, she looked in her neighbours’ bins, went through their post ...”

EXAMPLE QUESTION: List five things we learn about the woman

ANSWERS:

1. The woman looked in her neighbours’ bins
2. The woman went through her neighbours’ post

3.2 - Analysis Questions

Analysis (noun): *detailed examination of the elements or structure of something*

WHAT DO YOU NEED TO DO TO ANALYSE A TEXT?

- Highlight and understand the focus of the question.
- Read the text thoroughly and highlight any key details that can be used in your answer.
- Think about the language by selecting words and phrases chosen by the writer.
- Consider the effect of the selected words and phrases by suggesting how the writer is trying to make the reader react/feel.
- Discuss any techniques used by the writer and the effect they have on the reader.
- Link your comments back to the focus of the question.

3.3 - Impressions Questions

Impression (noun): *idea, feeling, or opinion about something or someone*

An impressions question will often begin with the words ‘*What impression does the writer create of...?*’

Impressions questions usually relate to a specific part of the text (e.g. lines 23 to 35) and focus on a *character*, a *setting* or an *event*.

When answering impressions questions it is vital to make a relevant point about the specific impression that is created and then back that up with evidence (a quotation from the text).

Key Phrasing:

The writer creates the impression that... using the words... to suggest that...

This phrase can be repeated. There are no marks for varying the writing style here.

EXAMPLE:

TEXT: “He was a tall man. Not just tall, somehow, he seemed bigger than his height, like a sunflower that had grown between daisies and was placing them all in shadow as he grew. In spite of the cold weather, he wore just a thin t-shirt and walked alone through the icy woods without any obvious suffering from the chill.”

ANSWERS:

1. **The writer creates the impression that the man seems taller than he really is using the words “seemed bigger”.**
2. **The writer creates the impression that the writer is taller than the other people around him describing him as a “sunflower” and the other people as “daisies” which are smaller flowers than sunflowers.**



3.4 – Writing Critically

3.5 – Quotations and Evidence

Tentative Words and Phrases

Could suggest...	Maybe
Might imply...	Possibly
May produce a sense of...	Perhaps
Appears to present...	Seems to

Comparison Connectives – Similarity and Difference

Similarly	In contrast / Contrastingly
In the same way	On the other hand
Also	However
In addition	Whereas

Some useful phrases

The writer presents / hints / creates ...
 Through the character of ... the writer explores/questions ...
 The writer challenges / explores / addresses the belief that ...
 (E.g.) Shakespeare asks the audience to question / consider ...

Using Quotations

Decide which quotations you want to use to prove your points.
 Remember that using short, integrated quotations is more effective than writing out large chunks of text.

Evidence is something that helps to **prove that what you are saying is true**.

When talking about evidence in relation to analysis, it means that you need to **prove your point by using a short quotation** from the text that you have read.

Step 1: Think about **which sections of the text support the point** or points you want to make.

Step 2: Highlight the evidence while working through the text – only highlight relevant details.

Step 3: Ask yourself **how this piece of evidence works**, what the purpose is and if it uses **any specific techniques**.

Step 4: When you begin to write your answer, review the evidence you have selected to **make sure it makes a valid point and is relevant to the question**.

Indented quotations

These are used for longer quotations. Rather than using quotation marks, you place the quotation on a new line, and indent the entire quotation to mark it apart from your own words.

Embedded quotations

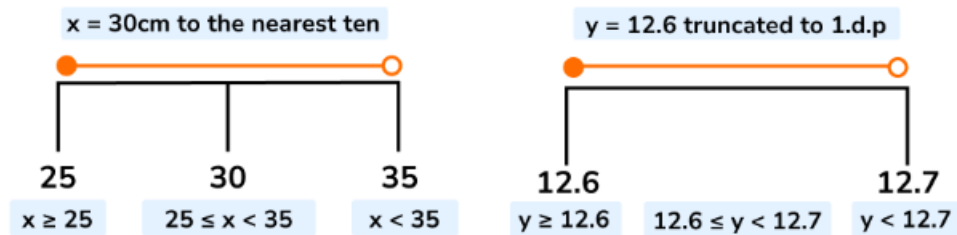
This is the sort of quotation you will use most often. It appears within the body of your own writing, placed within quotation marks (“...”) and you use it to quote a few words from a text.



Error Intervals

Error intervals are the **limits of accuracy** when a number has been **rounded or truncated**.

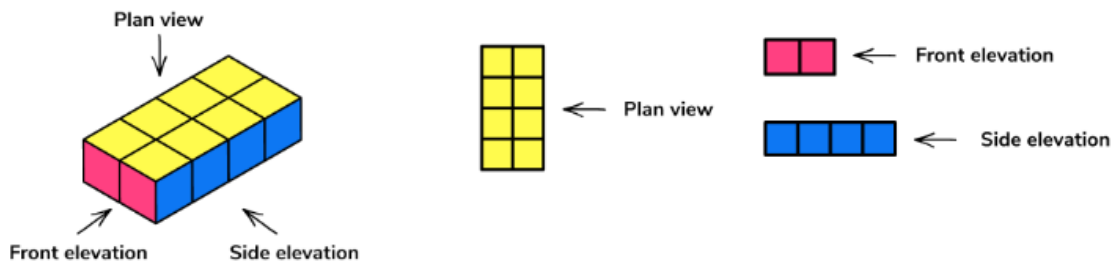
They are the maximum and minimum values that a number could have been before it was rounded or truncated.



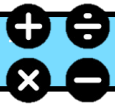
Plans and elevations


Plans and elevations are a way of representing a 3 dimensional shape on paper. We have three views of the 3D shape:

- From the **front** of the shape, called the **front elevation**
- From the **side** of the shape, called **side elevation**
- From above **looking down** on the shape, called the **plan view**



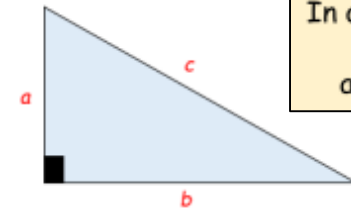
Key Term	Shape	Net
Cube		
Cuboid		
Triangular Prism		
Cylinder		
Square-based Pyramid		
Triangular-based Pyramid		
Cone		



Key terms	Definitions	Tips
Ratio	Ratio compares the size of one part to another part . Written using the ‘:’ symbol.	$3 : 1$ 
Proportion	Proportion compares the size of one part to the size of the whole . Usually written as a fraction.	In a class with 13 boys and 9 girls, the proportion of boys is $\frac{13}{22}$ and the proportion of girls is $\frac{9}{22}$
Simplifying Ratios	Divide all parts of the ratio by a common factor .	$5 : 10 = 1 : 2$ (divide both by 5) $14 : 21 = 2 : 3$ (divide both by 7)
Ratios in the form 1 : n or n : 1	Divide both parts of the ratio by one of the numbers to make one part equal 1 .	$5 : 7 = 1 : \frac{7}{5}$ in the form 1 : n $5 : 7 = \frac{5}{7} : 1$ in the form n : 1
Sharing in a Ratio	<ol style="list-style-type: none"> Add the total parts of the ratio. Divide the amount to be shared by this value to find the value of one part. Multiply this value by each part of the ratio. Use only if you know the total .	Share £60 in the ratio 3 : 2 : 1. $3 + 2 + 1 = 6$ $60 \div 6 = 10$ $3 \times 10 = 30, 2 \times 10 = 20, 1 \times 10 = 10$ $\pounds 30 : \pounds 20 : \pounds 10$

Pythagoras' Theorem

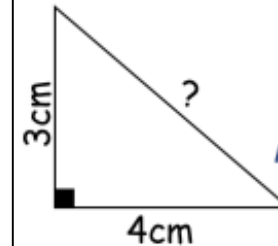
In any right-angled triangle the square of the hypotenuse is equal to the squares of the sum on the other two sides



In other words:

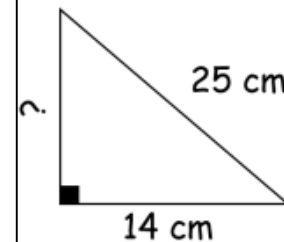
$$a^2 + b^2 = c^2$$

Finding a hypotenuse



$$\begin{aligned} a^2 + b^2 &= c^2 \\ 3^2 + 4^2 &= c^2 \\ 9 + 16 &= c^2 \\ 25 &= c^2 \\ 5 &= c \\ \text{Missing side} &= 5\text{cm} \end{aligned}$$

Finding a shorter side

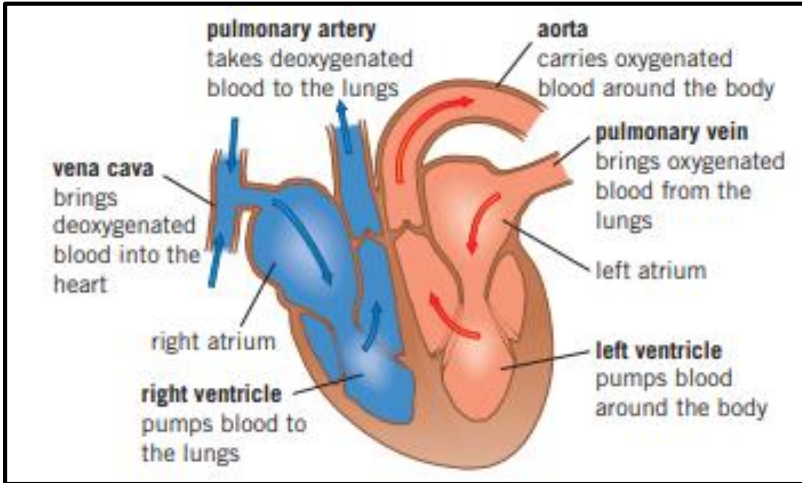


$$\begin{aligned} a^2 &= c^2 - b^2 \\ a^2 &= 25^2 - 14^2 \\ a^2 &= 625 - 196 \\ a^2 &= 429 \\ a &= \sqrt{429} \\ a &= 20.7 \\ \text{Missing side} &= 20.7\text{cm} \end{aligned}$$



The **heart** is made of **cardiac** muscle. It is supplied with oxygen by the **coronary artery**. **Heart rate** is controlled by **pace-maker cells** in the right atrium.

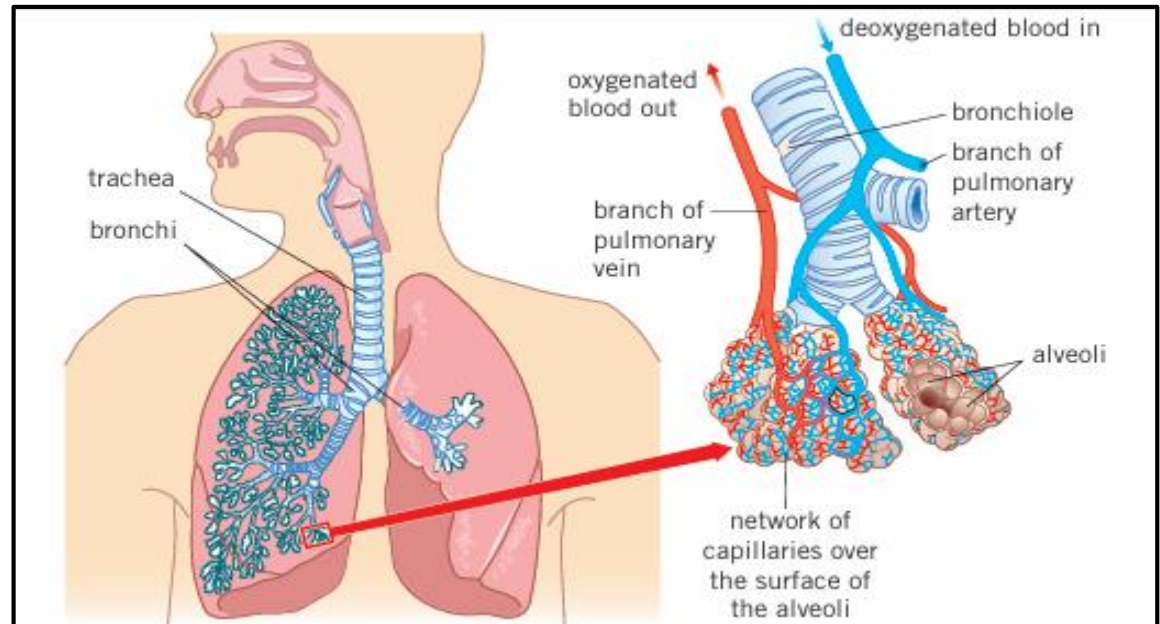
Humans have a **double circulatory system**. The blood passes through the heart twice.



Inhale = Breath in : Trachea → Bronchi → Bronchioles → Alveoli

Air we inhale has 21% oxygen, very little carbon dioxide or water vapour.

Air we exhale has 16% oxygen, 4% carbon dioxide and 1% water vapour

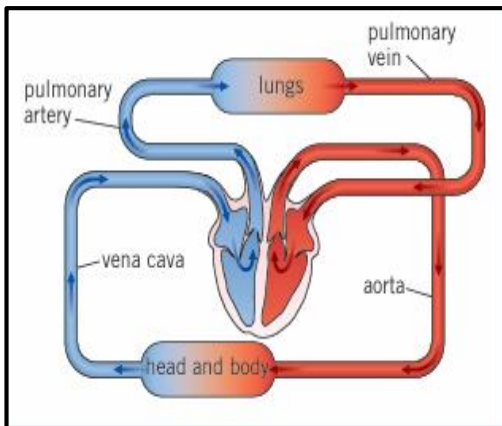


Red blood cells carry oxygen

Plasma (liquid) transports substances

Platelets forms blood clots

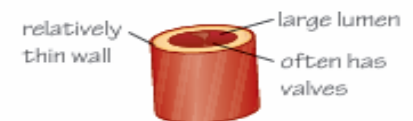
White blood cells defend the body



Artery – away from the heart



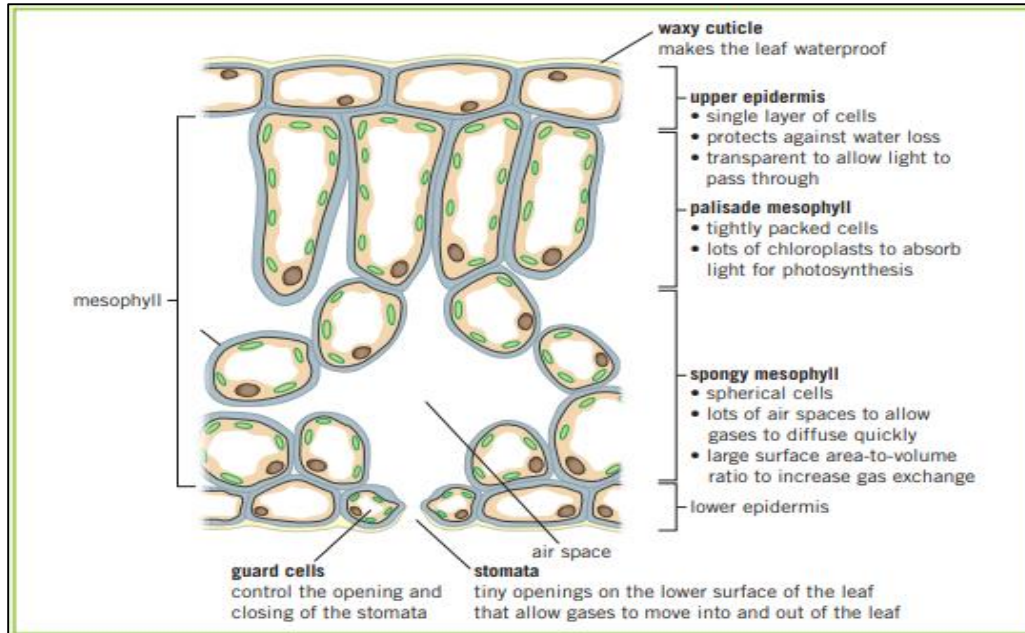
Vein – towards the heart



Capillary – connects arteries and veins. Very narrow lumen. Walls are one cell thick – short diffusion distance.



Leaves are organs because they contain many tissues that work together to perform photosynthesis.



Transpiration: Water is lost through the stomata by evaporation. This pulls water up from the roots through the **xylem**. The constant movement of water up the plant is called the **transpiration stream**.

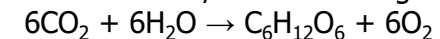
- provides water to cells to keep them turgid
- provides water to cells for photosynthesis
- transports mineral ions to leaves

Translocation: The movement of dissolved sugars from the leaves to the rest of the plant through the **phloem**.

Photosynthesis is an endothermic chemical reaction. **Chlorophyll**, the green pigment in **chloroplasts** in the leaves, absorbs the light energy.

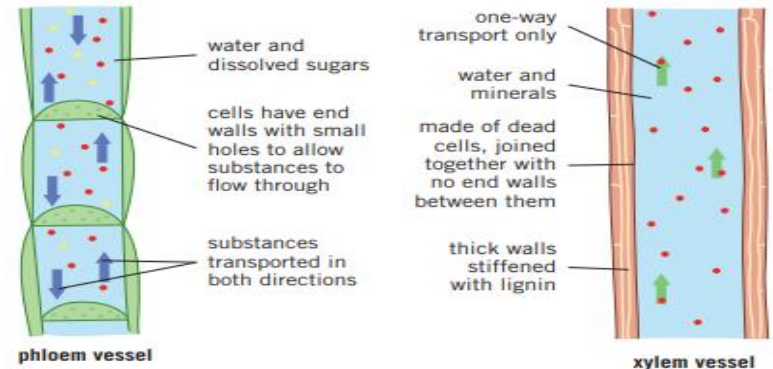
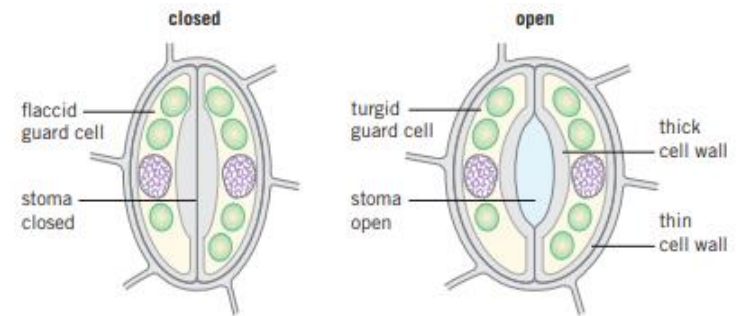
Word equation : carbon dioxide + water → glucose + oxygen

Symbol equation :



Stomata are tiny openings in the undersides of leaves – this placement reduces water loss through evaporation. They control gas exchange and water loss from leaves by:

- allowing diffusion of carbon dioxide into the plant for photosynthesis
- allowing diffusion of oxygen out of the plant. Guard cells are used to open and close the stomata.





One **mole** of a substance contains 6.02×10^{23} atoms, ions, or molecules. This is **Avogadro's constant**.

Every element has an **atomic mass**, A_r = its atomic number in grams.

Every substance has a **formula mass**, M_r = sum of the relative atomic mass of all the atoms in the formula.

One mole of a substance has the same mass as the M_r of the substance. **mass = $M_r \times \text{moles}$**

Atoms are held together by strong chemical bonds. In a reaction, those bonds are broken and new ones are made between different atoms.

- Breaking a bond requires energy so is endothermic.
- Making a bond releases energy so is exothermic.

Different bonds require different amounts of energy to be broken (their bond energies).

To work out the overall energy change of a reaction, you need to:

- 1 work out how much energy is required to break all the bonds in the reactants
- 2 work out how much energy is released when making all the bonds in the products.

overall energy transferred = energy required to break bonds – energy required to make bonds

- A positive number means an endothermic reaction.
- A negative number means an exothermic number.

Energy can be transferred:

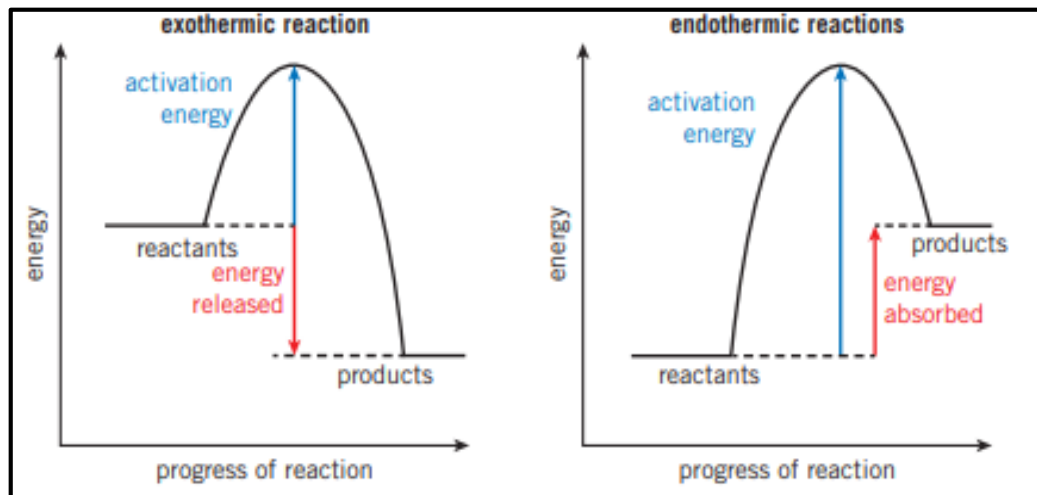
- to the surroundings (experiment) – **exothermic**
- from the surroundings (experiment) – **endothermic**

This energy transfer can cause a temperature change.

Energy is always conserved in chemical reactions.

A reaction profile shows whether a reaction is exothermic or endothermic.

The **activation energy** is the minimum amount of energy that particles must have to react when they collide.



Exothermic reactions –
oxidation • combustion • neutralisation

Endothermic reactions –
thermal decomposition • citric acid and sodium hydrogen carbonate



Resource	Main uses	Source	Advantages	Disadvantages
solar energy	generating electricity	sunlight transfers energy to solar cells	can be used in remote places very cheap to run once installed	supply depends on weather expensive to buy and install
	heating	sunlight transfers energy to solar heating panels	no pollution/greenhouse gases produced	cannot supply large scale demand
hydroelectric energy	generating electricity	water flowing downhill turns generators	low running cost no fuel costs reliable and supply can be controlled to meet demand	expensive to build hydroelectric dams flood a large area behind the dam, destroying habitats and resulting in greenhouse gas production from rotting vegetation
tidal energy	generating electricity	turbines on tidal barrages turned by water as the tide comes in and out	predictable supply as there are always tides can produce large amounts of electricity no fuel costs no pollution/greenhouse gases produced	tidal barrages: - change marine habitats and can harm animals - restrict access and can be dangerous for boats - are expensive to build and maintain cannot control supply supply varies depending on time of month
wave energy	generating electricity	floating generators powered by waves moving up and down	low running cost no fuel costs no pollution/greenhouse gases produced	floating generators: - change marine habitats and can harm animals - restrict access and can be dangerous for boats - are expensive to build, install, and maintain dependent on weather cannot supply large scale demand
wind energy	generating electricity	turbines turned by the wind	low running cost no fuel costs no pollution/greenhouse gases produced	supply depends on weather large amounts of land needed to generate enough electricity for large scale demand can produce noise pollution for nearby residents
geothermal energy	generating electricity heating	radioactive substances deep within the Earth transfer heat energy to the surface	low running cost no fuel costs no pollution/greenhouse gases produced	expensive to set up only possible in a few suitable locations around the world
biofuels	generating electricity transport	fuel produced from living or recently living organisms, for example, plants and animal waste	can be carbon neutral - the amount of carbon dioxide released when the fuel is burnt is equal to the amount of carbon dioxide absorbed when the fuel is grown reliable and supply can be controlled to meet demand	expensive to produce biofuels growing biofuels requires a lot of land and water that could be used for food production can lead to deforestation - forests are cleared for growing biofuel crops

Most of our energy currently comes from **fossil fuels – coal, oil, and natural gas.**

Reliable energy resources are ones that are available all the time (or at predictable times) and in sufficient quantities.

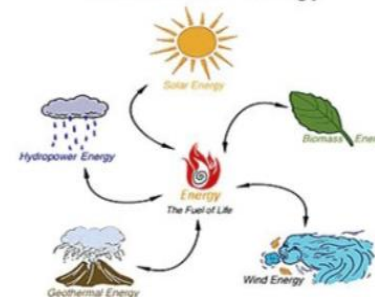
Non-renewable : not replaced as quickly as they are used, will eventually run out

Renewable : can be replaced at the same rate as they are used, will not run out

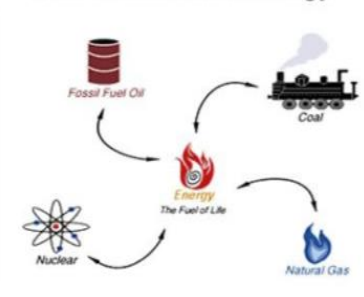
Non-renewable energy resources

Resource	Main uses	Source	Advantages	Disadvantages
coal	generating electricity	extracted from underground	<ul style="list-style-type: none"> enough available to meet current energy demands reliable - supply can be controlled to meet demand relatively cheap to extract and use 	<ul style="list-style-type: none"> will eventually run out release carbon dioxide when burned - one of the main causes of climate change release other polluting gases, such as sulfur dioxide (from coal and oil) which causes acid rain oil spills in the oceans kill marine life
oil	generating electricity transport heating			
natural gas	generating electricity heating			
nuclear fission	generating electricity	mining naturally occurring elements, such as uranium and plutonium	<ul style="list-style-type: none"> no polluting gases or greenhouse gases produced enough available to meet current energy demands large amount of energy transferred from a very small mass of fuel reliable - supply can be controlled to meet demand 	produces nuclear waste, which is: <ul style="list-style-type: none"> dangerous difficult and expensive to dispose of stored for centuries before it is safe to dispose of. nuclear power plants are expensive to: <ul style="list-style-type: none"> build and run decommission (shut down).

Renewable Energy



Non-Renewable Energy





3.1 Key Events

3.1.1. Dunkirk	The Allied forces of Britain, France, and Belgium were trapped by the German army in the area around Dunkirk, France in late May 1940. The British government authorized a rescue mission codenamed Operation Dynamo, which took place between May 26 & June 4, 1940 to bring the soldiers home.
3.1.2. Battle of Britain	The Battle of Britain was a major World War II air campaign that took place from July 10 to October 31, 1940. It was the first major military campaign to be fought entirely by air forces. The Royal Air Force (RAF) and the Royal Navy's Fleet Air Arm defended the United Kingdom from the German air force, the Luftwaffe, in a series of intense aerial clashes.
3.1.3. The Blitz	The Blitz was a series of bombing raids on British cities by the German Air Force (Luftwaffe) during World War II.
3.1.4. Evacuation	The British government evacuated millions of people from cities and towns to the countryside and other countries in order to keep them safe from bombing. Children were amongst the evacuees.
3.1.5. Pearl Harbour	This was an attack by Japan on the US pacific fleet at anchor in Pearl Harbour Hawaii on 7 th December 1941. 2393 Americans were killed and the attack helped bring USA in to the war.
3.1.6. Battle of the Atlantic	Lasting the entire war, this battle pitted the German navy against the allies who attempted to deliver supplies from USA to Britain.
3.1.7. D-Day	6 th June 1944 – Where the allied troops finally managed to secure a foothold on Nazi occupied Europe for the first time since Dunkirk 4 years earlier.
3.1.8. Atom Bom	The USA dropped the first atom bombs on Hiroshima (6 th August 1945) and later Nagasaki (9 th August 1945). Japan surrendered and WWII was over.

3.2 Key Terms

3.2.1. The Allies	The name given to the countries that fought alongside Britain during WWII.
3.2.2. The Home Front	It's often used to refer to the British public's involvement in World War II.
3.2.3. The Home Guard	The Home Guard was set up in May 1940 as Britain's 'last line of defense' against German invasion. Members of this 'Dad's Army' were usually men above or below the age of conscription and those unfit or ineligible for front line military service.
3.2.4. Rationing	A government-controlled practice that limits access to goods and services during times of war.
3.2.5. Women's Land Army (WLA)	This was a group of women who worked in agriculture to support Britain's food production during World War II.
3.2.6. Enigma	The name of the German code reading machine used to encrypt messages. This was broken by Alan Turin and his team in 1942 and gave the allies a huge advantage in the war.
3.2.7 Theatre of War	WWII was fought all over the world in many different environments including the jungles of Burma, the desert of northern Africa and the sea.



3.3 Key Individuals

3.3.1. Neville Chamberlain	British Prime Minister at the outbreak of WWII in 1939.
3.3.2. Winston Churchill	British Prime Minister who helped steer Britain through the war.
3.3.3. Josef Stalin	Leader of Russia.
3.3.4. Franklin D Roosevelt	President of USA who brought his country into the war in 1942. He died before the war ended.
3.3.5. Harry Truman	American President towards the end of the war. He ordered the dropping of the atom bombs on Japan.
3.3.6. Field Marshall Montgomery	Nicknamed 'Monty', he was placed in charge of the British military campaign and was one of the allied commanders.
1.5.6. General Dwight Eisenhower	US commander of the allied forces during WWII.



3.3.1. 3.3.2. 3.3.3. 3.3.4. 3.3.5. 3.3.6. 3.3.7.

3.4 Key Facts

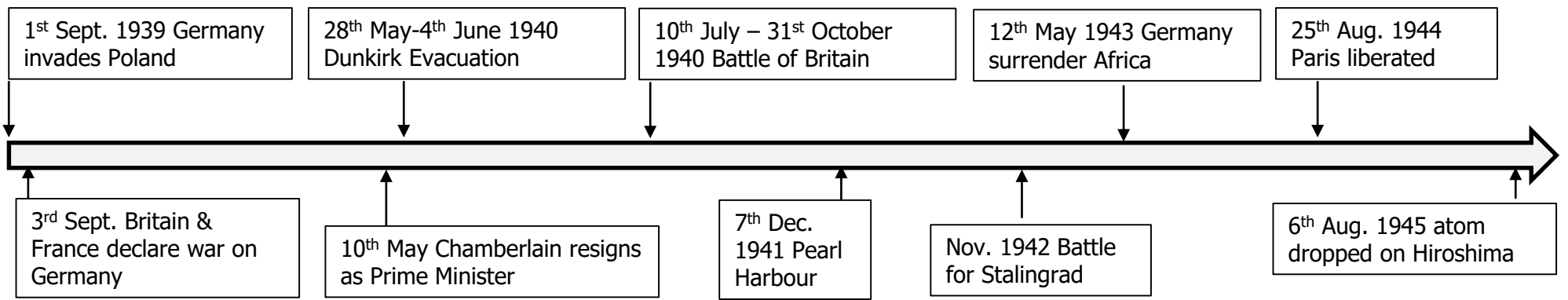
3.4.1. Russia	Britain, USA and Russia all fought on the same side against the Nazis. Relations with Russia were always difficult and cooled after war ended.
3.3.2. Start of WWII	The official start date was 2 nd September 1939 after Germany invaded Poland.
3.3.3. End of WWII	The actual end of WWII was 2 nd September 1945 after Japan had officially surrendered.
3.3.4. Death Toll	Although it is impossible to calculate an exact total, the death toll is estimated at between 35 & 85 million people. About 3% of the global population at the time.



BBC Bitesize



WWII in Colour





Diversity of land use and vital skills need land based sectors 1.1.3

What kind of jobs are available in each land based sector?

What skills do you need to get these jobs and do well in them?

Environmental Industries



Game and wildlife management. Gamekeepers work benefits many species.



Sustainability The UK's green sector grew four times faster than the rest of the economy between 2020 and 2021.



Environmental industries Renewable energy economy saw revenues grow 30.8% to £54.4 billion

Land Management & Production



Agriculture

Either arable (crops) or livestock (animals) food production. 60% of all food eaten in UK is produced on British farms.



Horticulture

Large scale production of fruit, vegetables or flowers. British growers produce 3.5m tons of fruit and veg a year.



Forestry

Large scale production of timber, largely for the construction industry.



Floristry

The arrangement and sale of bunches of flowers. It imports 86% of its cut flowers from outside the UK.



Fisheries Farming fish or fishing boats. UK vessels landed 640,000 tons of sea fish, worth £1.04 billion last year.



The **land-based engineering** industry in the UK has around 3,350 businesses and 22,850 employees



Leisure, field and adventure activities are generally for enjoyment, challenge or health and fitness benefits.

Technical skills and knowledge required to work within the industry



Health & Safety. Land Based industries can be dangerous if people behave badly. Machinery, tools and large animals must all be handled safely after a risk assessment has been carried out in line with the 1974 Health and Safety Act.



Work experience. Is vital to securing your land based job. With experience comes wisdom, which can only grow and can't be taught.



Technology. Being comfortable and capable with technology is vital in progressing in land based careers.



Vocational Qualifications give you a head start as show you have practical skills as well as academic knowledge.

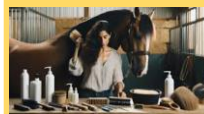


Personal skills/attributes; honesty, good time keeping, good communication skills, taking pride in your work and being trustworthy.

Animal Health and Welfare



Animal Care includes many job roles, such as veterinary nurses, dog training, pet grooming, animal welfare charities, and more. It is worth £1 billion to the UK economy, with 13,000 businesses, 78,000 employees, and many volunteers.



Equine Covering everything from working in competition and race yards, riding schools and professional horse training, there are lots and lots of different career opportunities in the equine industry.



Veterinary nursing Veterinary nurses are crucial members of the veterinary team. They provide invaluable support to veterinarians and ensure the well-being of animals. The annual salary for RVN roles in the UK typically ranges from £24,000 to £30,000



Farrier To become a qualified farrier, you must complete a four-year apprenticeship with an Approved Training Farrier (ATF). You must also pass exams and meet academic requirements



Factors that impact handling	
Internal	External
Age / life stage e.g Young / Adult / Elderly	Lighting / noise levels
Genes - Inherit traits from parents	Ventilation
Innate behaviour (instinct)	Temperature
Pregnancy	Weather
Diet	Human activity
Illness / poor health	Companion species
Gender	Presence of predator / prey
	Unfamiliar scents
	Enclosure construction / size
	Domestication
	Enrichment
	Security

Stress

A key welfare need is the need to be protected from pain, injury and ill health. These conditions can be caused by stress. Animals should be protected from stress and keepers should look out for signs of it.

Sign of stress	Reducing stress
Shakling	Behave calmly
Overgrooming	Positive reinforcement
Aggression	Handle little + often
Appetite change	Create a safe environment
Diarrhea	Ensure welfare needs are met

Abnormal behaviour

Animals that are under stress or unwell will often show abnormal behaviours. It is important we can recognize these to address any husbandry issues that may be causing them.

Pacing	Head swinging	Self mutilation
Pawing	Chewing enclosure	Overgrooming

Signs of ill-health

Long term stress or other factors can lead to ill health. It is important we recognise and address signs of ill-health in order to meet the welfare needs of the animal.

Signs of ill health		
Lethargic	Hiding	Rapid breathing
Lack of appetite	Aggression	Sleeping more often