

# KNOWLEDGE

# ORGANISER

Year 10  
Half Term 2



Name:

Tutor Group:

Academic Year:




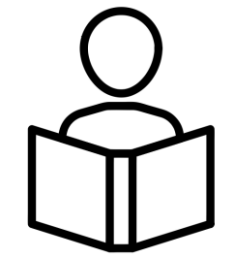
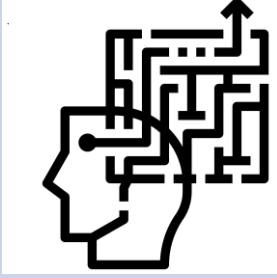
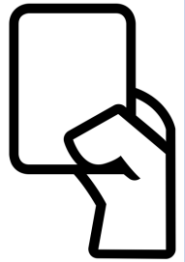



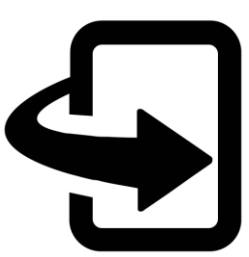
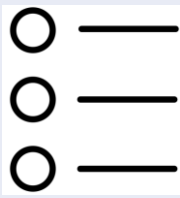


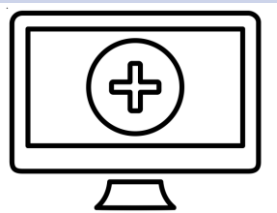
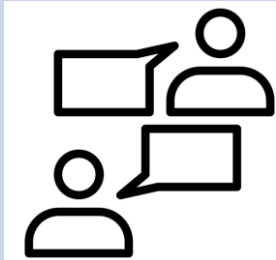

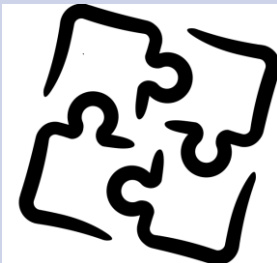

# How to use your Knowledge Organiser



The aim of the knowledge organiser is to ensure that **ESSENTIAL KNOWLEDGE** is stored and retrieved over a long period of time.



You need to ensure that you keep your knowledge organiser in your bag, ready for revision, quizzing and to refer to at any time in all of your subjects.

	Look, Cover, Write, Check	Definitions to Key Words	Flash Cards	Self Quizzing	Mind Maps	Paired Retrieval
Step 1	<p>Look at and study a specific area of your knowledge organiser</p> 	<p>Write down the key words and definitions.</p> 	<p>Use your knowledge organiser condense and write down key facts and/or information on your flash cards.</p> 	<p>Read through a specific area of your knowledge organiser</p> 	<p>Create a mind map with all the information that you can remember from your knowledge organiser.</p> 	<p>Ask a partner or someone at home to have the quiz questions or flash cards in their hands.</p> 
Step 2	<p>Flip the knowledge organiser and write everything you can remember.</p> 	<p>Try not to use the solutions to help you.</p> 	<p>Add diagrams or pictures if appropriate. Write the solutions on the back of the cards.</p> 	<p>Turn over and answer the questions related to that area.</p> 	<p>Check your knowledge organiser to correct or improve your mind map.</p> 	<p>Ask them to test you by asking questions on the section you have chosen from your knowledge organiser.</p> 
Step 3	<p>Check what you have written. Correct mistakes and add extra information. Repeat.</p> 	<p>Check your work. Correct using red pen and add more information if appropriate.</p> 	<p>Self quiz using the cards or ask some to help by quizzing you.</p> 	<p>Turn back over and mark your quiz. Keep quizzing until you get all questions correct.</p> 	<p>Try to make connections that links information together.</p> 	<p>Either say or write down you answers.</p> 

**CORE**

# Mathematics Knowledge Organiser

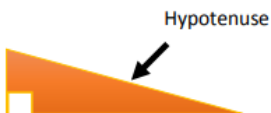
## Pythagoras and Trigonometry

### Pythagoras Theorem

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

Pythagoras is used to find missing sides in **Right-angled triangles**

### Key Facts



#### HYPOTENUSE

This is the longest side in a right-angled triangle and is **ALWAYS** opposite the right angle

#### Method to find the hypotenuse

- Square side a
- Square side b
- Add together
- Square root

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

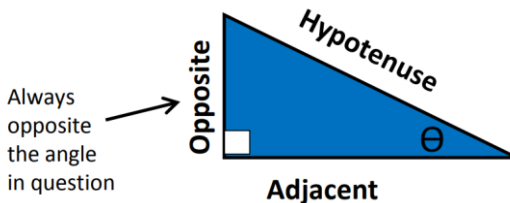
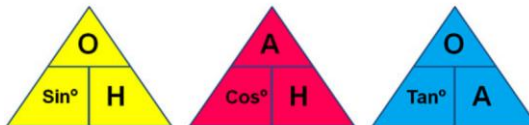
### Method to find a shorter side

- Square side c
- Square side a/b (whichever is known)
- Subtract a/b from c
- Square root

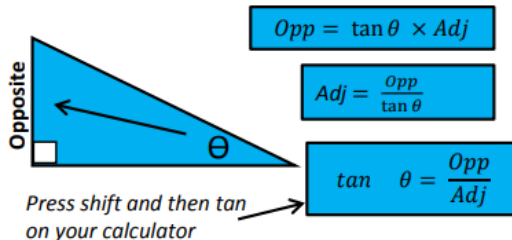


### Trigonometry

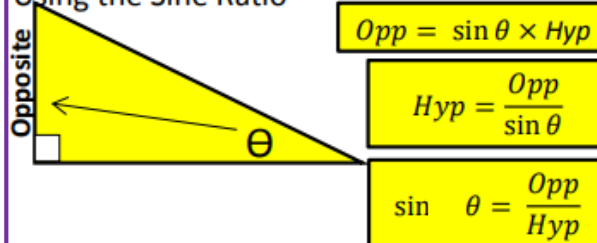
**SOH CAH TOA**



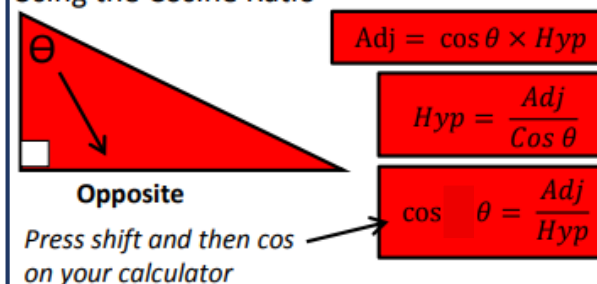
### Using the Tangent Ratio



### Using the Sine Ratio



### Using the Cosine Ratio



### Exact Trig Values

	0°	30°	45°	60°	90°
sin	0	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{\sqrt{3}}{2}$	1
cos	1	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$	0
tan	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	-

### KEY VOCABULARY/TERMS

Pythagoras, Trigonometry, Hypotenuse, Opposite, Adjacent, Tangent, Cosine, Sine, Surd, Ratio, Inverse

# Mathematics Knowledge Organiser

## Pythagoras and Trigonometry

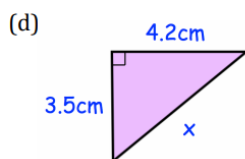
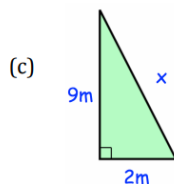
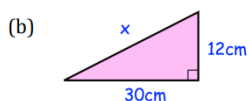
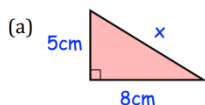
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Pythagoras is used to find missing sides in **Right-angled triangles**

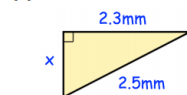
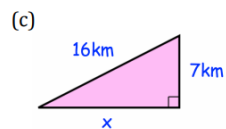
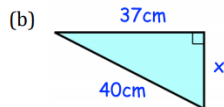
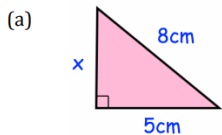
Calculate x

Give each answer to 2 decimal places.



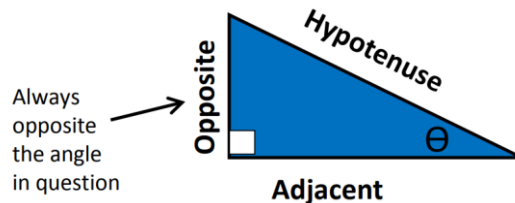
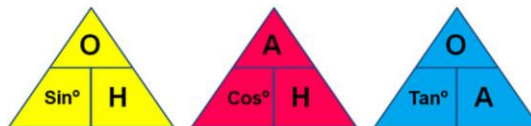
Calculate x

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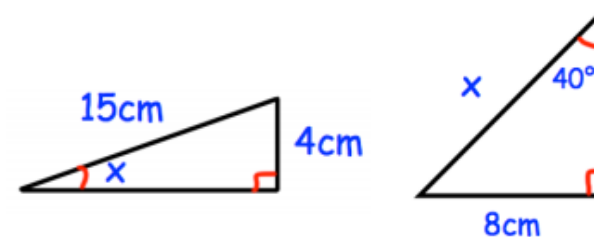


### Trigonometry

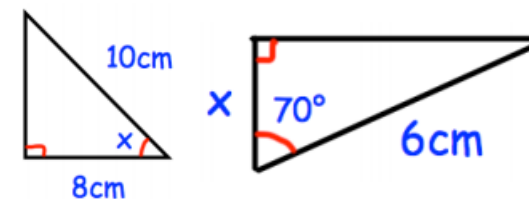
**SOH CAH TOA**



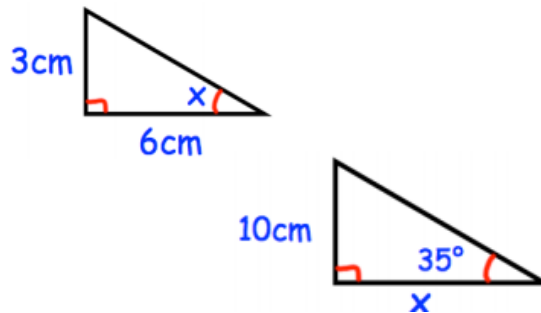
Find the missing side/angle



Find the missing side/angle



Find the missing side/angle



Write down the exact values of each of the following

- (a)  $\sin 30^\circ$     (b)  $\cos 0^\circ$     (c)  $\tan 45^\circ$     (d)  $\sin 90^\circ$   
 (e)  $\sin 0^\circ$     (f)  $\cos 60^\circ$     (g)  $\tan 0^\circ$     (h)  $\sin 45^\circ$

### KEY VOCABULARY/TERMS

Pythagoras, Trigonometry, Hypotenuse, Opposite, Adjacent, Tangent, Cosine, Sine, Surd, Ratio, Inverse

# Mathematics Knowledge Organiser

## Angles

### 5H Angles and Trigonometry

#### 5a Polygons, angles and parallel lines

#### Important ideas

7 sides  
5 triangles

The **sum of the interior angles** in a **polygon** can be calculated by thinking about the **number of triangles** that can fit inside the polygon. This is always **2 less than the number of sides**

$360^\circ$   $360^\circ$

It doesn't matter how many sides a polygon has, the **exterior angles always add up to  $360^\circ$** . If you cut them out, they would form a whole turn

A D  
B C E  
Line DE

When solving angle fact problems you must use **three-letter angle notation**, **two-letter line notation** and **state every angle fact** you use to tell the 'logical story' of how you solved the problem

Start Finish

Sometimes there is **more than one way** to solve an angle fact problem. It doesn't matter which approach you use so long as it is **mathematically correct** and you **state all the angle facts** you use

#### Important vocabulary

<b>Polygon</b>	A <b>2D shape</b> made from <b>3 straight sides</b> or more
<b>Regular polygon</b>	A <b>polygon</b> with <b>all sides equal</b> in length and <b>all interior angles equal</b> in size
<b>Isosceles triangle</b>	A triangle with <b>two equal length sides</b> . The two <b>base angles</b> are equal in size
<b>Equilateral triangle</b>	A triangle with <b>three equal length sides</b> . The <b>three interior angles</b> are equal in size
<b>Interior angle</b>	An angle between <b>two adjacent sides</b> inside a polygon
<b>Exterior angle</b>	An angle between a <b>side of a polygon</b> and an <b>adjacent side extended outward</b>
<b>Parallel</b>	<b>Lines</b> that have the <b>same distance</b> continuously between them. They <b>never intersect</b>

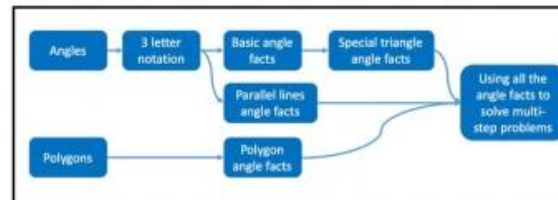
#### Key facts to memorise- polygon angle facts

Polygon names		Polygon angle facts	
3 sides	Triangle	Sum of interior angles in a polygon with n sides = $(n - 2) \times 180$	$(6 - 2) \times 180 = 720^\circ$
4 sides	Quadrilateral	Sum of exterior angles in a polygon = $360^\circ$	$360^\circ$
5 sides	Pentagon	Interior angle + exterior angle = $180^\circ$	$180^\circ$
6 sides	Hexagon		
7 sides	Heptagon		
8 sides	Octagon		
9 sides	Nonagon		
10 sides	Decagon		

#### Key facts to memorise- basic angle facts

Basic angle facts	
Angles around a point add up to $360^\circ$	$a + b + c = 360^\circ$
Angles on a straight line add up to $180^\circ$	$a + b = 180^\circ$
Vertically opposite angles are equal	
Angles in a triangle add up to $180^\circ$	$a + b + c = 180^\circ$
Angles in a quadrilateral add up to $360^\circ$	$a + b + c + d = 360^\circ$
Base angles in an isosceles triangle are equal	
Angles in an equilateral triangle are all $60^\circ$	$a = 60^\circ$
The exterior angle of a triangle is equal to the sum of the two opposite interior angles	$a + b = c$

#### Learning objectives knowledge structure



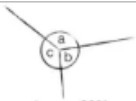

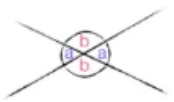


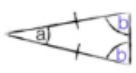


#### Historical importance

300 BC	Greek mathematician <b>Euclid</b> writes a collection of 13 books called <b>The Elements</b> . These introduce and <b>prove angle facts</b> and important ideas in <b>number theory</b> . Starting from just <b>7 basic assumptions (axioms)</b> , Euclid proved all the angle facts we still use today. Most mathematicians say <b>The Elements</b> is the <b>most important</b> maths book ever written. It introduced the idea of using <b>logic</b> to <b>prove theorems</b> in maths.
250 BC	<b>Archimedes</b> used <b>Pythagoras' Theorem</b> in polygons to find <b>upper</b> and <b>lower bounds</b> for the value of <b>Pi</b> . He first imagined a circle <b>inscribed</b> by a <b>regular polygon</b> (vertices touching the circumference of the circle). He then imagined the same circle <b>circumscribed</b> by a <b>regular polygon</b> (midpoints of sides touching the circumference of the circle). By calculating the <b>areas</b> of the <b>polygons</b> and knowing the <b>area</b> of the <b>circle</b> was between these values he could find <b>upper</b> and <b>lower bounds</b> for the value of <b>Pi</b> .

#### Key facts to memorise- angles in parallel facts

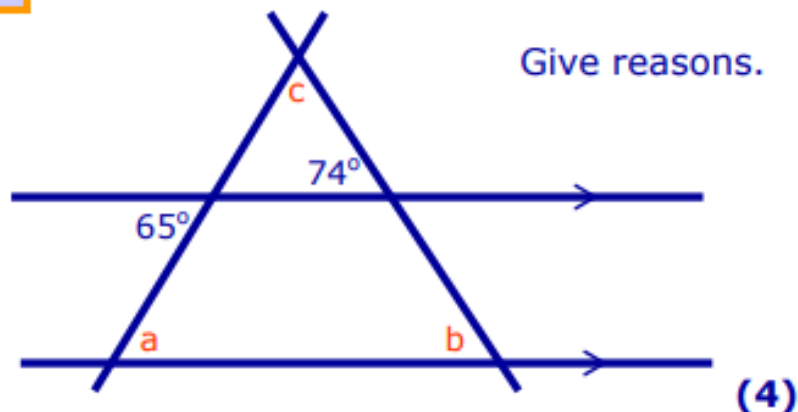
Angles in parallel lines facts		
=	$180^\circ$	=
Corresponding angles are equal	Co-interior angles add up to $180^\circ$	Alternate angles are equal

Which angle fact should be used to solve each problem?

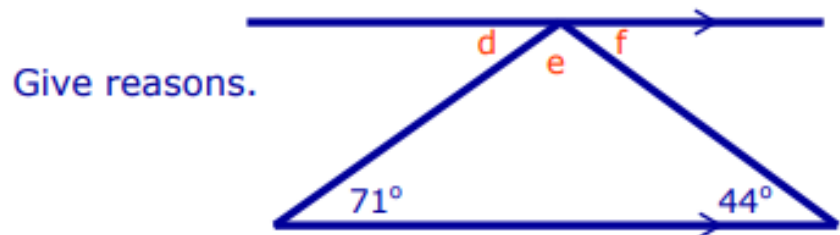
	 $a + b + c = 360^\circ$
	 $a + b = 180^\circ$
	
	 $a + b + c = 180^\circ$
	 $a + b + c + d = 360^\circ$
	
	 $a = 60^\circ$
	 $a + b = c$

State the angle fact to be used and calculate the missing angle for each.

**1** Find the size of angles  $a$ ,  $b$  and  $c$



**2** Find the size of angles  $d$ ,  $e$  and  $f$



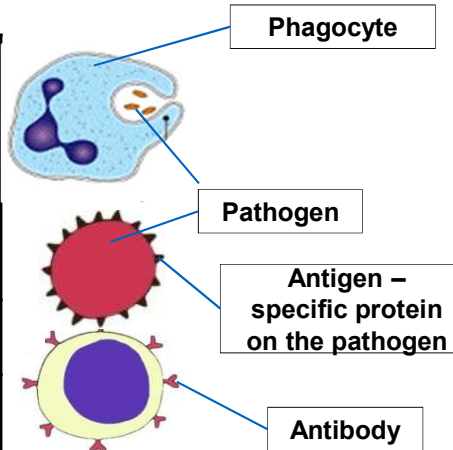
# Biology Knowledge Organiser

## Infection and Response

### HUMAN DEFENCE SYSTEMS

#### NON-SPECIFIC DEFENCES

<b>Nose</b>	Nasal hairs, sticky mucus and cilia prevent pathogens entering through the nostrils.
<b>Trachea and bronchus</b>	Lined with mucus to trap pathogens. Cilia move the mucus upwards to be swallowed.
<b>Stomach acid</b>	Stomach acid (pH1) kills most ingested pathogens.
<b>Skin</b>	Waterproof barrier. Glands secrete oil which kill microbes



<b>WHITE BLOOD CELLS</b>
<b>Phagocytosis</b> Phagocytes engulf the pathogens
<b>Antibodies</b> Specific proteins that attach to the antigens of pathogens.
<b>Antitoxins</b> Neutralises the toxins produced by bacteria.

### DRUGS Traditionally drugs were extracted from plants and microorganisms.

<b>Antibiotics e.g. Penicillin</b>	Kill infective bacteria inside the body
<b>Painkillers e.g. Paracetamol</b>	Treat the symptoms of a disease only.

<b>Vaccination</b>	<b>Small amount of inactive pathogen injected</b>	<b>1<sup>st</sup> infection by pathogen</b>	White blood cells detect pathogens in the vaccine. Antibodies are released into the blood and a memory is created.
		<b>Re-infection by the same pathogen</b>	Antibodies are made much faster so symptoms don't appear

### Drugs have to be tested and trialled for toxicity, efficacy and dosage

**Preclinical trials** - cells, tissues and animals  
**Clinical trials** - use healthy volunteers and patients, below are the stages

Stage 1	Stage 2	Stage 3	Stage 4
Healthy volunteers to check TOXICITY	Small number patients to test EFFICACY	A larger number of patients to test DOSAGE	A DOUBLE BLIND trial using a PLACEBO

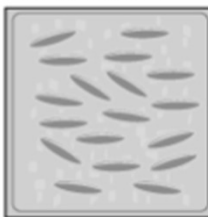
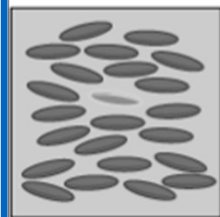
### Antibiotic Resistant Bacteria

A bunch of bacteria, including a resistant variety...

...get bathed in antibiotics. Most of the normal bacteria die.

The resistant bacteria multiply and become more common.

Eventually, the entire infection evolves into a resistant strain.



● normal bacterium    ● dead bacterium  
 ● resistant bacterium

### PLANTS

#### DEFENCES

Mineral	Needed for.	DEFENCES
Nitrates	To synthesise protein.	<b>Physical</b> Cellulose cell walls Waxy cuticle Bark on trees
Mg	To synthesise chlorophyll	<b>Chemical</b> Antibacteria Poison
P	Produce flowers and fruit.	<b>Mechanical</b> Thorns Hairy stems/leaves Mimicry Drooping of leaves

### PATHOGENS are microorganisms which cause disease.

Pathogen makes you feel ill	How it reproduces	Disease	Symptoms	Transmission	Treatment/Control of spread
<b>Virus</b>	Reproduces inside living cells which burst when full.	<b>Measles</b>	Fever, red skin rash.	Droplet infection from sneezes and coughs.	Vaccination as a child.
<b>Bacteria</b>	Reproduces rapidly and releases toxins	<b>HIV</b>	Flu like systems, damage to immune system, leading to diseases such as pneumonia	Sexual contact and exchange of body fluids.	Anti-retroviral drugs and use of condoms.
<b>Protist</b>		<b>Tobacco mosaic virus</b>	Mosaic pattern on leaves	Enters via wounds in epidermis caused by pests/tools.	Remove infected leaves, control pests, wash tools.
<b>Fungus</b>		<b>Salmonella</b>	Fever, cramp, vomiting, diarrhoea.	Food prepared in unhygienic conditions or not cooked properly	Improve food hygiene, wash hands, vaccinate poultry, cook food thoroughly
		<b>Gonorrhoea</b>	Green discharge, pain when urinating	Direct sexual contact or exchange of body fluids.	Use condoms. Treatment using antibiotics.
		<b>Malaria</b>	Reoccurring fever, headache, vomiting, diarrhoea	By an animal vector (mosquitoes)	Prevent breeding of mosquitoes. Use of nets to prevent bites
		<b>Rose black spot</b>	Purple black spots on leaves	Spores carried via wind or water	Remove infected leaves. Spray with fungicide.



### Pathogens

1. What is a pathogen?
2. What type of pathogen causes salmonella?
3. How can bacterial infections be treated?
4. What is a symptom of gonorrhoea?
5. How is malaria transmitted?
6. How can the spread of tobacco mosaic virus be prevented?
7. How do viruses make you feel ill?

### Human Defenses

8. Describe how the skin stops pathogens entering the body.
9. Which type of non-specific defense kills pathogens in contaminated food?
10. What 3 ways do white blood cells defend against pathogens?
11. What is phagocytosis?
12. How do antibodies defend against pathogens?
13. What is an antigen?
14. How are bacterial toxins neutralised?

### Drugs

15. How were drugs first developed?
16. What is a painkiller, give an example.
18. What are drugs tested on before humans?
19. What 3 things are drugs tested for during a trial?
20. What is antibiotic resistance?
21. What is a vaccine?

### Plants





22. Which nutrient is needed for chlorophyll production?
23. Name a physical defence.
24. Explain why a plant needs nitrates.

### Further Opportunities




1. Visit Oak Academy and work through the topic, answer the questions in your reflection log  
<https://classroom.thenational.academy/units/infection-and-response-4f71>
2. Describe how the effectiveness of antibiotics can be tested.
3. Explain what a double blind trial and a placebo are.
4. HIGHER: Research monoclonal antibodies and their uses.

# A Christmas Carol

## Context

	<p><b>Poverty:</b> Dickens had a comfortable childhood until the age of twelve, when his father was sent to a debtors' prison and Charles had to work in a factory. The harsh conditions made a lasting impression: through his works of social criticism, he sought to draw attention to the plight of the poor.</p>
	<p><b>The Poor Law:</b> In order to deter people from claiming financial help, the government made claimants live in workhouses – essentially prisons for the poor. Dickens spent 1843 touring factories and mines in England and wished to highlight the situation facing the poor. 'A Christmas Carol' was published in December of that year. <b>"Are there no Prisons?...and the Union workhouses?"</b></p>
	<p><b>The Victorian era</b> was between 1837 and 1901 (most of Dickens' life). Whilst this was a time of industrial revolution, it was also an extremely harsh time to live, with huge differences between the lifestyles of the rich and poor. The Victorian era was a period of great change. In this time, the population of England doubled – from 16.8 million 1851 to over 30 million in 1901. Rapid population growth fuels concerns that there would not be enough food to go around: <b>"If they would rather die," said Scrooge, "they had better do it, and decrease the surplus population."</b></p>
	<p><b>Social Class:</b> Despite industrial changes altering the social landscape, there were still relatively distinct social classes in operation: the nobility upper class, the middle class, and the working class. Life was terrible for the poorest: lack of money resulted in a negligible food supply. For some working families, money was so tight that they required their children to work in order to survive.</p>



## Big Ideas

<p><b>Poverty and Greed</b></p> 	<p>Dickens wanted to highlight the plight of the poor in Victorian England, and how they are exploited by the greed of the wealthy. He used the harshness of winter to further emphasise this. He also uses Scrooge as a vehicle to show that financial wealth does not mean contentment; Scrooge is impoverished in other ways (family, friends, happiness). <b>"Darkness was cheap, and Scrooge liked it."</b></p>
<p><b>Redemption</b></p> 	<p>Characters like Fred and Bob demonstrate compassion and forgiveness towards Scrooge; both are seen to live happy lives – they demonstrate the path to Scrooge's redemption. Scrooge's kindness towards Bob Cratchit in Stave 5 is the antithesis of his treatment of Bob in Stave 1, with each act emphasising his redemption. <b>"I am as light as a feather, I am a happy as an angel, I am as merry as a school-boy. I am as giddy as a drunken man."</b></p>
<p><b>Isolation vs. Family</b></p> 	<p>Scrooge is <b>"solitary as an oyster"</b> – isolated and unhappy. Scrooge was Marley's <b>"sole friend and sole mourner"</b>. The warmth and emotional richness of families is used as a contrast to Scrooge's self-determined isolation. The disruption to Scrooge's childhood and family life may also have contributed to his future behaviour. Dickens' message may be that family is the cornerstone of a happy society.</p>

## Key Quotes





- "Hard and sharp as flint" (Description of Scrooge, Stave 1)
- "I wear the chain I forged in life" (Jacob Marley, Stave 1)
- "From the crown of its head there sprung a bright clear jet of light" (Stave 2)
- "...the master passion, Gain, engrosses you." (Belle to Scrooge, Stave 2)
- "Scrooge entered timidly, and hung his head before this spirit." (Stave 3)
- "The boy is Ignorance. The girl is Want. Beware them both." (Ghost of Christmas Present, Stave 3)
- "Avarice, hard dealing, griping cares? They have brought him to a rich end, truly!" (Scrooge, Stave 4)
- "I will not shut out the lessons that they teach." (Scrooge, Stave 4)

## Transferable knowledge




<p><b>Allegory</b></p> 	<p>A story, poem, or picture that can be interpreted to reveal a hidden meaning, typically a moral or political one.</p>
<p><b>The text is a construct</b></p> 	<p>Don't forget! <b>Nobody in the novella is real:</b> every character has been <i>created</i> by Dickens in order to make a specific point or serve a purpose. For example, Fred <b>embodies</b> the ideas of kindness, generosity and the importance of family that Dickens was eager to communicate.</p>

# A Christmas Carol

## Context

	<ul style="list-style-type: none"> <li>• What happened to Dickens' father when Dickens was 12?</li> <li>• In what year was 'A Christmas Carol' published?</li> <li>• What did the Poor Law require of people who claimed financial support?</li> </ul>	
	<ul style="list-style-type: none"> <li>• What happened to the population of England during the Victorian era?</li> <li>• Briefly describe living conditions for the poorest families in Victorian England.</li> <li>• Research Thomas Malthus and his views on population growth. How do his ideas relate to 'A Christmas Carol'?</li> </ul>	



## Big Ideas

<p><b>Poverty and Greed</b></p> 	<ul style="list-style-type: none"> <li>• What does Dickens use the character of Scrooge to show?</li> <li>• How does the setting in Stave 1 reflect Scrooge's own attitudes?</li> </ul>
<p><b>Redemption</b></p> 	<ul style="list-style-type: none"> <li>• What is the significance of the characters of Bob Cratchit and Fred?</li> <li>• Examine Scrooge's treatment of Bob Cratchit in Stave 1. Compare this with his actions in Stave 5. What do you notice?</li> <li>• Using a page of your reflection log, write down all the factors that influence Scrooge's redemption. At what point does he begin to change? Which spirit do you think has the most impact? Why?</li> </ul>
<p><b>Isolation vs. Family</b></p> 	<ul style="list-style-type: none"> <li>• Why does Scrooge live in isolation? What are the events in his life that have caused this?</li> <li>• In what way do Scrooge's attitudes differ to Fred's in Stave 1?</li> <li>• Describe Scrooge's experience of childhood. How might this have influenced his actions as an adult?</li> <li>• Write a page of your reflection log on the Cratchit family. How do their ideas and attitudes differ to Scrooge's? What point might Dickens be making?</li> <li>• Re-read Stave 3. How does Dickens show that family and friendships are vital?</li> </ul>

## Key Quotes

- For each of the key quotations listed on the knowledge organiser (highlighted in yellow and in the 'key quotes' box), write down the quotation and then complete an 'explosion' task, exploring its links to themes and characters.
- Use a page of your reflection log to copy out the quotes from memory – categorise them by theme or character.

## Transferable knowledge

<p><b>Allegory</b></p> 	<ul style="list-style-type: none"> <li>• What is an allegory? How does this term apply to 'A Christmas Carol'?</li> </ul>
<p><b>The text is a construct</b></p> 	<ul style="list-style-type: none"> <li>• Explain what is meant by this phrase.</li> <li>• For each character, explain why they have been constructed – what might Dickens have wanted to achieve through each one?</li> </ul>

## Vocabulary

Key vocabulary is included on the knowledge organiser in bold and italics.

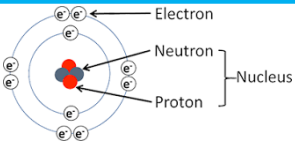
- Find each word and write a list of key vocabulary.
- Look up and write down a definition for any word you don't understand or are unsure of.
- Write a new sentence for each word, relating it to an aspect of 'A Christmas Carol'.

## Extra research: Characters

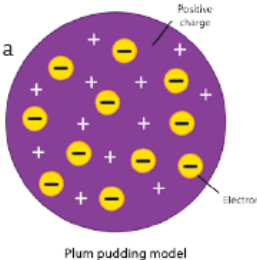
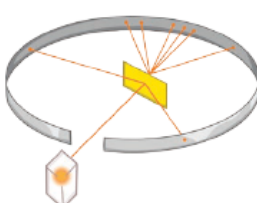
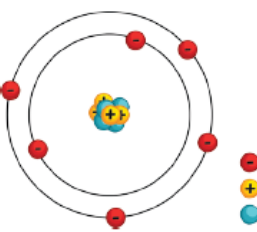
- What is the significance of the charity collectors in Stave 1?
- Write a page of your reflection log on the character of Fred and what he represents.
- How is Bob Cratchit treated in Stave 1? How does this compare with Scrooge's treatment of him in Stave 5?
- Write a page of your reflection log on the characters of Belle, Fan and Mrs Cratchit – how are the women in the text presented by Dickens?
- How does Fezziwig contrast with Scrooge as an employer?
- What is meant by 'The boy is Ignorance. The girl is Want.'? What does this say about Victorian society?

# Knowledge Organiser

## Atomic Structure

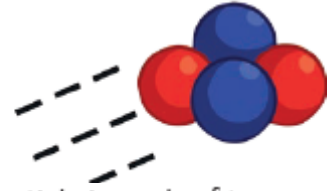


**Proton:** Charge Positive Mass 1  
**Electron:** Charge Negative Mass Negligible  
**Neutron:** Charge Neutral Mass 1

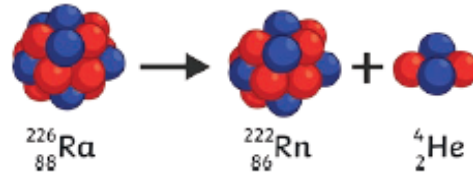
Scientist	Time	Contribution
John Dalton	Start of 19th century	Atoms were first described as solid spheres.
JJ Thomson	1897	Thomson suggested the plum pudding model – the atom is a ball of charge with electrons scattered within it. 
Ernest Rutherford	1909	Alpha Scattering experiment – Rutherford discovered that the mass is concentrated at the centre and the nucleus is charged. Most of the mass is in the nucleus. Most atoms are empty space. 
Niels Bohr	Around 1911	Bohr theorised that the electrons were in shells orbiting the nucleus. 
James Chadwick	Around 1940	Chadwick discovered neutrons in the nucleus.

### Alpha

Alpha radiation is an alpha particle emitted from the nucleus of a radioactive nuclei. It is made from two protons and two neutrons. They can't travel too far in the air and are the least penetrating – stopped by skin and paper. However, they are highly ionising because of their size.



An alpha particle is made of two protons and two neutrons. The atomic number goes down by two and mass number decreases by four.



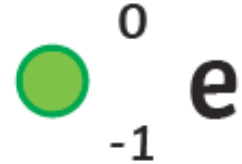
### Gamma

A gamma wave is a wave of radiation and is the most penetrating – stopped by thick lead and concrete.

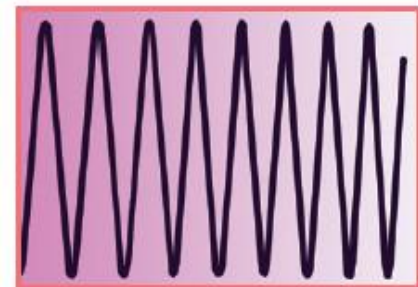
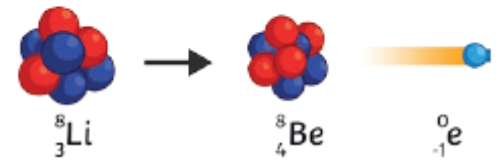
There is no change to the nucleus when a radioactive source emits gamma radiation. It is the nucleus getting rid of excess energy.

### Beta

Beta radiation is a fast moving electron that can be stopped by a piece of aluminium. Beta radiation is emitted by an atom when a neutron splits into a proton and an electron.



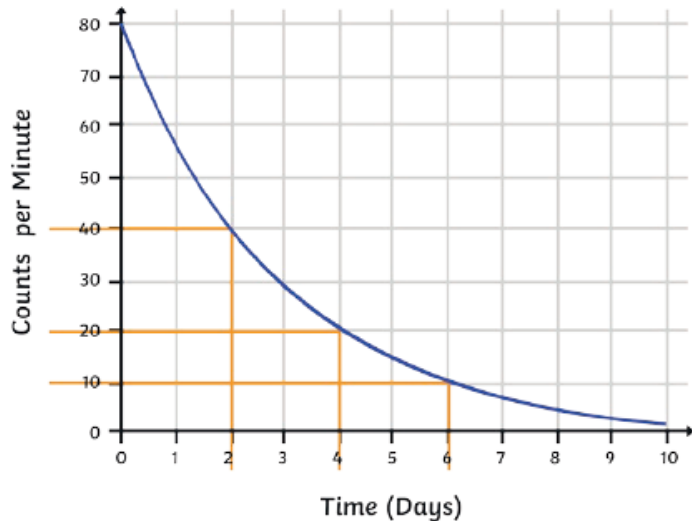
A neutron turns into a proton and releases a an electron. The mass of the nucleus does not change but the number of protons increases.



## Isotopes:

Atoms of the same element can have different numbers of neutrons.

Some atomic nuclei are unstable. The nucleus give out radiation as it changes to become more stable. This is a random process called radioactive decay



## Half Life:

Time taken for the number of radioactive nuclei in an isotope to halve.

Radioactivity is random.

Decay is measured in becquerels Bq. 1 Bq is 1 decay per second.

## Irradiation:

Process of exposing an object to nuclear radiation.

To prevent this sources are placed in lead-lined boxes and often workers stand behind lead barriers or wear lead protective clothing.

Irradiation stops when away from source.

## Contamination:

Unwanted presence of materials containing radioactive atoms on other materials. The hazard is due to the decay of the contaminating atoms. The type of radiation emitted affects the level of hazard.

## Danger:

Alpha: Most dangerous when inside body, due to ionisation.

Beta: More dangerous outside body as able to penetrate.

Gamma: Most dangerous outside body as penetrating.

## Background Radiation:

Is around us all the time and comes from natural sources such as rocks, cosmic rays from space and man-made sources such as fallout from nuclear weapons testing and accidents.

### Atomic Structure:

1. Draw a labelled diagram of the current atom.
2. Where are Protons and Neutrons found?
3. Where are Electrons found and what are their charge?
4. What charge are Protons and Neutrons?
5. Describe the Plum Pudding Model.
6. Describe the experiment that Rutherford devised.

### Radioactive Decay

1. Describe Alpha Decay.
2. Describe Beta Decay.
3. Describe Gamma radiation.

### Dangers of Radiation.

1. Define Irradiation.
2. Define Contamination.
3. Give an example of background radiation.
4. Compare the dangers of Alpha and Gamma Radiation.

### Isotopes:

1. Define Isotope.
2. Define Half-Life.
3. Calculate half life for isotope on graph.

### Further Opportunities:

Research and describe the worst radioactive accident in history (Chernobyl). Include ideas about half life and the radioactive emissions and their hazards and impacts.

Make a 3 D Model of an atom. (Use different coloured sweets for Protons, Electrons and Neutrons).

Make a revision map / revision cards of the links between Physics Atomic Structure and Chemistry Atomic Structure and The Periodic Table.

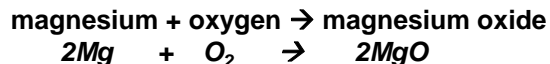
# Chemistry Knowledge Organiser

## Year 10: Chemical changes part 1 (Triple FT)

### KEY VOCAB

#### Reactions of metals with Oxygen. This is called **Oxidation**:

Metals react with oxygen to form metal oxides:



#### **The reactivity series:**

Metals form positive ions when they react.

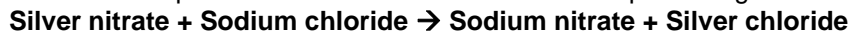
The reactivity of a metal is related to its tendency to form positive ions.

The reactivity series arranges metals in order of their reactivity (their tendency to form positive ions).

Carbon and hydrogen are non-metals but are included in the reactivity series, they can be used to extract some metals from their oxides; if they are more reactive than the metal.


#### **Displacement:**

A more reactive metal can displace a less reactive metal from a compound. Eg:



#### **The reactivity series:**

potassium	most reactive	K
sodium		Na
calcium		Ca
magnesium		Mg
aluminium		Al
carbon		C
zinc		Zn
iron		Fe
tin		Sn
lead		Pb
hydrogen		H
copper		Cu
silver		Ag
gold		Au
platinum	least reactive	Pt



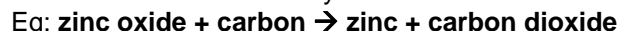
#### Reactions of metals with water and acids:

	Reactions with water	Reactions with acid
<b>Group 1 metals</b>	Reactions get more <b>vigorous</b> as you go down the group	Reactions get more vigorous as you go down the group
<b>Group 2 metals</b>	Do not react with cold water	Observable reactions include fizzing and temperature increases
<b>Zinc, iron and copper</b>	Do not react with cold water	Zinc and iron react slowly with acid. Copper does not react with acid.

#### **Extraction of metals using reduction:**

Unreactive metals, such as gold, are found in the Earth as the metal itself. They can be mined straight from the ground.

Metals less reactive than carbon can be **extracted** from their oxides by reduction.



In this **reduction** reaction the zinc oxide loses the oxygen.

#### **The pH scale and neutralisation:**

You can use **universal indicator** or a pH probe to measure the acidity or alkalinity of a solution against the **pH scale**.

Acids produce hydrogen ions ( $\text{H}^+$ ) in **aqueous solutions**.

Aqueous solutions of alkalis contain hydroxide ions ( $\text{OH}^-$ ).

In neutralisation reactions, hydrogen ions react with hydroxide ions to produce water:  $\text{H}^+ + \text{OH}^- \rightarrow \text{H}_2\text{O}$

**Oxidation:** Where a substance gains oxygen. Eg: iron rusting.

**Reduction:** Where a substance loses oxygen. Eg: Using carbon to extract iron from iron oxide.

**Reactivity series:** A list of metals placed in order, from most reactive to least reactive;

**Displacement:** A reaction where a more reactive metal takes the place of a less reactive metal in a compound.

**Group 1 and 2 metals:** These are metals on the far left of the periodic table.

**Vigorous:** A vigorous reaction is a fast one.

**Extracted:** This means taken out from. Eg: metals are extracted from a metal oxide.

**Universal indicator:** A mixture of chemicals that changes colour in acids and alkalis of different strengths.

**pH scale:** This shows the strengths of acids and alkalis using numbers from 1 to 14.

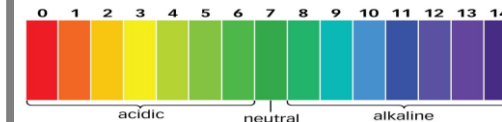
**Aqueous solutions:** are made by dissolving a substance in water.

**Salt:** A substance produced by a neutralisation reaction.

**Neutralisation:** Acids can be neutralised by alkalis and bases

**Base:** A base is a substance that neutralises an acid e.g. a soluble metal hydroxide or a metal oxide

#### **The pH scale:**



# Chemistry Knowledge Organiser

## Year 10: Chemical changes part 2 (Triple FT)

### Reactions of metals and acids:

Acids react with some metals to produce **salts** and hydrogen. Eg:  $\text{metal} + \text{acid} \rightarrow \text{metal salt} + \text{hydrogen}$

The type of salt made depends on the type of acid used in the reaction:

magnesium + hydrochloric acid  $\rightarrow$  magnesium chloride + hydrogen

zinc + sulfuric acid  $\rightarrow$  zinc sulfate + hydrogen

### Neutralisation reactions using **bases** and **alkalis**

sodium hydroxide + hydrochloric acid  $\rightarrow$  sodium chloride + water

calcium carbonate + sulfuric acid  $\rightarrow$  calcium sulfate, + carbon dioxide + water

Acid name	Salt name
Hydrochloric acid	Chloride
Sulfuric acid	Sulfate
Nitric acid	Nitrate

### Making a soluble salt – Required practical – 6 mark question:

*Soluble salts can be made from reacting acids with solid insoluble substances (e.g. metals, metal oxides, hydroxides and carbonates).*

*Add the solid to the warm acid and stir in the beaker, until no more dissolves. Filter off excess solid and then crystallise in an evaporating dish, to produce solid salts, and pat dry.*

### Titration:

Titration are used to work out the precise volumes of acid and alkali solutions that react with each other.

1. Use the pipette to add 25 cm<sup>3</sup> of alkali to a conical flask and add a few drops of indicator.
2. Fill the burette with acid and note the starting volume. Slowly add the acid from the burette to the alkali in the conical flask, swirling to mix.
3. Stop adding the acid when the end-point is reached (the appropriate colour change in the indicator happens). Note the final volume reading. Repeat steps 1 to 3 until you get consistent readings.

### Electrolysis:

When an ionic compound is melted or dissolved in water, the ions are free to move. These are then able to conduct electricity and are called **electrolytes**. Passing an electric current through electrolytes causes the ions to move to the electrodes.

In the diagram on the right, Molten lead bromide is electrolysed. The positive Lead **cation**, moves to the **negative cathode**. The negative **Bromide anion**, moves to the **positive anode**.

Metals which are more reactive than carbon are extracted using **electrolysis**, because the carbon can not **reduce** the metal. Eg: Aluminium oxide is electrolysed. This process is expensive due to the huge amount of energy required to produce the electrical current.

**Electrolysis of aqueous solutions:** The ions **discharged** when an **aqueous solution** is electrolysed depend on the relative reactivity of the elements involved.

**At the negative electrode:** Metal will be produced on the electrode if it is less reactive than hydrogen. Hydrogen will be produced if the metal is more reactive than hydrogen.

**At the positive electrode:** Oxygen is formed at positive electrode. unless you have a halide ion (Cl<sup>-</sup>, I<sup>-</sup>, Br<sup>-</sup>) then you will get chlorine, bromine or iodine formed at that electrode.

## KEY VOCAB

**Alkali:** An alkali is a soluble base e.g. metal hydroxide.

**Titration:** an experiment to find the precise volume of acid and alkali that neutralise each other

**Electrolysis:** splitting up ionic compounds using electricity.

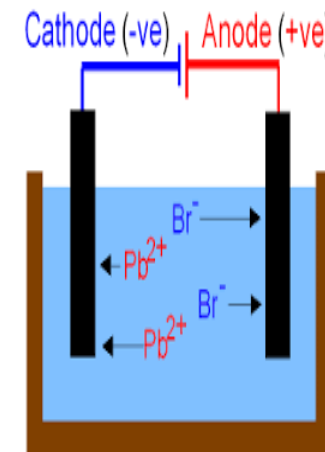
**Electrolyte:** Charged ions that move in a solution to conduct electricity.

**Anode:** a positive electrode

**Cathode:** negative electrode:

**Anion:** Negative ion, moves to the anode.

**Cation:** positive ion, moves to the cathode.





### Key Vocabulary:

1. Rusting is an example of what type of reaction?
2. What does the reactivity series show?
3. What is a displacement reaction?
4. What does the pH scale tell us?
5. What is an aqueous solution?

### Reactions of metals with Oxygen :

6. Write the word equation for the oxidation of Calcium
7. What type of ions do metals make when they react?
8. Name 4 metals which are less reactive than carbon, but more reactive than hydrogen?
9. Name a metal that can displace lead from lead chloride?
10. Name 3 metals less reactive than hydrogen

### Reactions of metals with water and acids:

11. Name a group 1 metal that reacts more vigorously with water than Sodium?
12. Name a group 2 metal that reacts more vigorously with acids than Magnesium?
13. What would you observe if Calcium is placed in cold water?
14. What would you observe if copper is placed in cold water?
15. What would you observe if copper is placed in an acid?

### Extraction of metals using reduction:

16. Name 3 metals that can be found as metal in the Earth's crust?
17. Name 2 metals that can be extracted from their oxide using reduction by carbon?
18. When a metal oxide is reduced by carbon what is lost from the metal oxide?
19. When a metal oxide is reduced by carbon, which gas is produced?
20. Name a metal that can not be extracted from its oxide by using carbon?

### The pH scale and neutralisation:

21. What does a pH of 2 tell you?
22. What ions do acids always produce?
23. What ions do alkalis produce?

24. What is the pH range for alkalis?
25. What is the ionic equation for neutralisation?

### Reactions of metals and acids:

24. Which gas is produced when metals react with acids?
25. Which salt is produced when zinc reacts with hydrochloric acid?
26. Which salt is produced when Magnesium reacts with sulfuric acid?
27. Which gas is always produced when a metal carbonate reacts with an acid?
28. What is a base?

### Making a soluble salt – Required practical – 6 mark question:

24. Which salt will be made if Calcium oxide reacts with hydrochloric acid?
25. What two things would you do to the acid to make it react faster?
26. When would you stop adding the Calcium oxide?
27. What equipment would you need to filter the excess Calcium oxide?
28. How would you make sure your salt was dry?

### Titrations:

29. What are titrations used for?
30. What do you add to the conical flask?
31. What do you put in the burette?
32. If you used universal indicator, when would you stop adding the acid?
33. What would you write down?

### Electrolysis:

34. What is an electrolyte?
35. What charge does a cation have?
36. What charge does an anode have?
37. Why is extracting aluminium, using electrolysis expensive?
38. What is produced at the negative cathode, if Zinc chloride is electrolysed?
39. What is produced at the positive anode, if Zinc chloride is electrolysed?

### Further opportunities:

1. Visit the Oak academy and work through lessons 1-22, write your answers in your reflection log: <https://classroom.thenational.academy/units/chemical-changes-a5ba>
2. Visit Kay science. Watch the videos for the topic 4 and write answers in your reflection log. <https://www.kayscience.com/course/chemistry>
3. Keep practicing by trying these online quizzes at footprints science: <https://www.footprints-science.co.uk/index.php>

**EBACC**

# History Knowledge Organiser

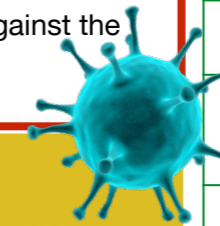
## Britain: Health and the People 3. A revolution in medicine.

### Key individuals

Louis Pasteur, Robert Koch, John Tyndall, William Cheyne, Paul Ehrlich, Humphry Davy, Horace Wells, William Clark, Dr Crawford Long, William Morton, Robert Liston, Queen Victoria, James Simpson, Joseph Lister, Edwin Chadwick, Dr John Snow, Joseph Bazalgette.

### Treatment of disease

1861 - Louis Pasteur discovered Germ Theory proving the theory of Spontaneous Generation wrong but it was not accepted immediately. Robert Koch applied Pasteur's theory to human diseases. He was the founder of bacteriology and proved that specific bacteria caused specific diseases. In 1876 he discovered the microbe responsible for anthrax, 1884 - cholera and 1882 - tuberculosis. He also discovered stains to dye microbes under a microscope. Pasteur and Koch were rivals and sponsored by their governments which motivated their work. Pasteur and his team created a vaccine for rabies and anthrax. This work was accepted in Britain due to John Tyndall and William Cheyne. Paul Ehrlich (Koch's assistant) found chemicals that would not only stain but kill specific types of bacteria. In 1909 he discovered a chemical cure for syphilis. These cures became known as 'magic bullets'. Prontosil worked against the germs that caused blood poisoning and 'sulpha drugs' were developed for meningitis, pneumonia and scarlet fever.



### Key dates

1832	Edwin Chadwick Public Health Report
1837	Cholera outbreak
1842	Ether used
1844	Nitrous oxide used
1846	Ether used in public demonstration
1848	First Public Health Act, Hannah Greener died
1853	Queen Victoria uses chloroform
1854	Dr Snow discovers cause of cholera
1858	Great stink and Bazalgette starts building sewers
1861	Germ theory
1866	Sanitary Act
1875	Second Public Health Act, Artisan's Dwelling Act, Sale of Food and drugs
1909	Chemical cure for syphilis

### Improvements in surgery

The key problems of surgery were pain, infection and blood loss. Anaesthetics - nitrous oxide was identified by Humphrey Davy and used by Horace Wells in 1844 to extract teeth. Ether was also used by the dentist William Clark in 1842 and Dr Crawford Long removed a neck growth with it. In 1846 William Morton gave a public demonstration and in December Robert Liston amputated a leg with it. It was difficult to inhale though and was also flammable. Chloroform was the alternative and discovered by James Simpson. Surgeons could now take more time over operations but this had initial problems such as dosage. Hannah Greener died of an overdose during a toenail operation in 1848. In 1853 Queen Victoria used chloroform in childbirth making it more acceptable. Antiseptics - Joseph Lister had read about Germ Theory and applied it to the problem of infection. He used carbolic acid to stop the spread of germ spraying it on hands, wounds, equipment and in the room. This dramatically reduced death from infection but they were still wearing outdoor clothing and it was not pleasant to use. The next step was aseptic surgery where germs were removed from the room. Facemasks, rubber gloves, gowns and sterilised instruments replaced public operating theatres and dramatically reduced infections.



### Public Health

The Industrial Revolution led to a population explosion and a movement of people into the rapidly expanding towns. The government attitude was laissez-faire meaning they did not believe it was their job to deal with domestic matters. The back to back houses and lack of sanitation led to cholera (a waterborne disease) epidemics in 1837, 1838, 1848, 1853-5 and 1865-6. In 1832 Edwin Chadwick collected information about the conditions on towns in the Report on the Sanitary Condition of the Labouring Population. This identified problems in the towns and cities leading to the 1848 Public Health Act. However this was voluntary and many councils did nothing. In 1854 Dr John Snow discovered the cause of Cholera adding more evidence that something needed to be done. This was followed by the Great Stink of 1858 where the sewage in the Thames led the government to leave the city. As a result Joseph Bazalgette was given the job of building the sewers under London. He was given £3 million. He used 318 million bricks and built 83 miles of sewers removing 420 million gallons of sewage a day. Once fully operational cholera never returned. Louis Pasteur discovered germs in 1861 adding more evidence that something must be done. After working class men gained the vote in 1867 the government brought in more laws to improve people's lives. 1866 - Sanitary Act. 1875 - Artisans Dwelling Act, Sale of Food and Drugs Act. The Second Public Health Act of 1875 was compulsory and made councils responsible for public health. They had to provide clean water, build sewers, keep the streets clean and light them. Laissez-faire was now at an end.



### KEY VOCABULARY/TERMS - tier 3

Spontaneous generation, germ theory, bacteria, bacteriology, microscope, government, vaccine, rabies, anthrax, cholera, syphilis, chemical, prontosil, magic bullets, blood poisoning, meningitis, pneumonia, scarlet fever, anaesthetics, antiseptics, ether, chloroform, nitrous oxide, aseptic, surgery, sterilised, operating theatre, pain, infection, blood loss, sanitation, laissez-faire, sanitation, sewers, artisan, dwelling, Public Health Act, water, voluntary, compulsory.

# History Knowledge Organiser

## Britain: Health and the People 3. A revolution in medicine.

### Quiz questions

1. When was Germ theory discovered?
2. Who discovered Germ theory?
3. What was the connection between the answer to qu 2 and Robert Koch?
4. What microbes did Koch identify/discover?
5. What are the 3 problems of surgery?
6. What is an anaesthetic?
7. What anaesthetics were used during the 1800s and who used each?
8. What was the significance of Hannah Greener?
9. What was the significance of Queen Victoria?
10. What is an antiseptic and who used them?
11. What is the next step of advancement after antiseptic surgery?
12. What other additions were made to surgery?
13. Which people were connected to public health?
14. What did the government do to improve public health in the 1800s?
15. What was laissez-faire?
16. Who was the Sewer King and what did he do for London?
17. What was a magic bullet?
18. Which magic bullet treated blood poisoning?

### Prior Knowledge

	masculine	feminine	plural
'the'	le	la	les
'a' or 'some' (pl)	un	une	des

If a noun begins with a vowel or *h*, **le** or **la** shortens to **l'**, e.g. *l'église* (the church).



#### G How to say 'in'

*J'habite ...* (I live ...)  
**dans** une ville/un village (in a town/village)  
**au** centre-ville (in the town centre)  
**en** ville (in town)  
**à la** campagne/montagne (in the countryside/mountains)  
 NB: **au** bord de la mer (at the seaside).  
 Feminine countries (e.g. *Angleterre, Écosse, Irlande*): use **en**.  
 Masculine countries (e.g. *le pays de Galles*): use **au**.  
 Plural countries (e.g. *les États-Unis*): use **aux**.  
 Towns and cities (e.g. *Paris*): use **à**.  
 Points of the compass (e.g. *l'est*): use **dans**.

#### G On peut + infinitive

**On peut** means 'you can'. It comes from the verb *pouvoir* (to be able to, can). It is usually followed by the infinitive of another verb.  
**On peut aller à un match de foot.** **You can go** to a football match.  
**On peut visiter le château.** **You can visit** the castle.

★ **il y a ...** means 'there is ...' or 'there are ...'.

**Il y a un stade.** There is a stadium.  
**Il y a des magasins.** There are some shops.  
**Il n'y a pas de/d' ...** means 'there isn't a ...' or 'there aren't any ...'.  
**Il n'y a pas de gare.** There isn't a station.  
**Il n'y a pas d'hôtels.** There aren't any hotels.

Note: after the negative *il n'y a pas de ...*, you do not need *un, une* or *des*.



#### G Irregular adjectives

The following adjectives are irregular:

masc sg	fem sg	masc pl	fem pl
beau	belle	beaux	belles
vieux	vieille	vieux	vieilles

- Most adjectives go **after** the noun, e.g. *une ville intéressante*.
- But some go **before** the noun, e.g. *un grand château, un petit village, une belle plage, de vieux bâtiments, de jolies maisons*.
- NB *des* changes to *de* when the adjective comes before the noun.



### Ma ville/région

#### G The superlative

You use the **superlative** to say 'the biggest', 'the longest', 'the most popular', etc. To form the superlative, put **le/la/les + plus** before an adjective. The adjective must agree with the noun.  
**le plus long** fleuve the longest river  
**la plus haute** tour the highest tower  
**les plus belles** plages the most beautiful beaches  
 If the adjective goes after the noun, so does the superlative:  
 le musée **le plus populaire** the most popular museum  
 To say 'the best ...' use **le/la/les meilleur(e)(s) ...**

#### G Negatives

Most negative expressions are in two parts and go **around** the verb:  
*ne ... rien* (nothing)  
*ne ... jamais* (never)  
*ne ... personne* (nobody, not anyone)  
*ne ... plus* (no longer, not any more)  
*ne ... que* (only)  
*ne ... aucun(e)* (no, not any, not a single ...)  
 NB: **aucun** agrees with the noun.  
*ne ... ni ... ni ...* (neither ... nor ...) is in three parts: put a noun after each **ni**.

#### G The pronoun y

The pronoun **y** means 'there'. It replaces **à + a noun**.  
 • In the present tense, **y** goes in front of the verb:  
*On y va tous les ans.* We go **there** every year.  
 • If the verb is followed by an infinitive, **y** goes in front of the infinitive:  
*Tu peux y faire de la voile.* You can go sailing **there**.  
 • In the perfect tense, **y** goes in front of the part of avoir or être:  
*J'y suis allée l'année dernière.* I went **there** last year.

### Les renseignements

#### G Asking questions using quel

To ask 'which ...?' or 'what ...?', use the adjective **quel ...?**  
 It must agree with the subject of the sentence.

masc sg	quel
fem sg	quelle
masc pl	quels
fem pl	quelles

#### G Asking questions

- To ask for something (e.g. a map), use *Avez-vous ...?*
- To ask whether there is something (e.g. a restaurant), use *Est-ce qu'il y a un/une ...?*
- For other types of information, use question words like *comment?, à quelle heure?, où?*
- Quel/quelle/quels/quelles ...?* ('which ...?' or 'what ...?') is an adjective and must agree with the noun.  
**Quels sont les horaires d'ouverture?**  
 What are the opening hours?



### La météo

#### G The future tense

You use the **future tense** to say 'will' or 'shall' do something.  
 To form this tense, use the **future stem** plus the appropriate ending.  
 For **-er** and **-ir** verbs, the future stem is the infinitive.

<i>je resterai</i> (I will stay)	<i>nous resterons</i> (we will stay)
<i>tu resteras</i> (you will stay)	<i>vous resterez</i> (you will stay)
<i>il/elle/on restera</i> (he/she/we will stay)	<i>ils/elles resteront</i> (they will stay)

Some key verbs have irregular future stems, but use the same endings as above:

<i>aller - j'irai</i> (I will go)
<i>avoir - j'aurai</i> (I will have)
<i>être - je serai</i> (I will be)
<i>faire - je ferai</i> (I will do)
<i>venir - je viendrai</i> (I will come)

#### G Si clauses

**Si** ('s' before the vowel *i*) means 'if'. Use **si + a weather phrase + the near future tense** to describe future plans.  
*S'il pleut, on va aller au cinéma.*  
 If it rains, we're going to go to the cinema.



Translate these sentences into English, and note if they are true or false.

- 1 La France est plus grande que l'Irlande.
- 2 Les serpents sont plus dangereux que les chats.
- 3 Prince William est plus riche que moi.
- 4 Les carottes sont meilleures que les bonbons.
- 5 Londres est moins grand que Manchester.
- 6 Bart Simpson est aussi intelligent que Lisa.

Want more practice?  
CGP French workbook.  
Page 24.

Make these sentences negative by putting the negative expression in brackets in the correct place.

Then translate each sentence into English.

- 1 Je vais souvent à Lyon. (*ne ... pas*)
- 2 J'ai visité la France. (*ne ... pas*)
- 3 Je suis très fatigué. (*ne ... pas*)
- 4 Hier soir, je suis allée au club de basket. (*ne ... pas*)
- 5 Je resterai à la maison. (*ne ... pas*)
- 6 Je fume. (*ne ... plus*)
- 7 J'ai fumé. (*ne ... jamais*)
- 8 J'ai 10 euros. (*ne ... que*)
- 9 J'aimais les films et la musique. (*ne ... ni ... ni ...*)
- 10 Je mange à midi. (*ne ... rien*)

Want more practice?  
CGP French workbook.  
Page 34 & 35.

NEGATIVE  
 POSITIVE

Use each prompt to write a question in French.

Ask a friend if he/she:

- 1 likes fast food
- 2 is going to the beach
- 3 lives in a big house
- 4 has visited Paris
- 5 went to the cinema last night

Ask:

- 6 where the cinema is
- 7 at what time the film starts
- 8 when the cinema is open
- 9 how you can travel to the cinema
- 10 who is in the film

What will things be like for Sofia in 10 years' time?

- 1 J'aurai trois enfants.
- 2 Je serai agent de police.
- 3 J'habiterai à Londres.
- 4 Je ferai beaucoup de sport.
- 5 J'irai à la salle de sport régulièrement.
- 6 On sera riche.
- 7 On aura une grande maison.
- 8 Mon compagnon travaillera pour Renault.

Want more practice?  
CGP French workbook.  
Page 46 & 47.

Translate this article about the future into English.

Dans le futur, il y aura beaucoup de robots. Ces robots parleront et penseront comme nous, les humains. Un robot type sera très pratique: il aidera à faire le ménage, préparera nos repas et s'occupera de nos enfants. Le robot fera les devoirs et rangera la chambre des enfants. Mais il ne nous aimera pas!





# GCSE Computer Science

## Topic 1.2 Memory

Computer memory is a physical device capable of storing information temporarily or permanently.

ROM stands for Read Only Memory.

ROM is non-volatile. This means that without power, data is retained (safe/stored).

ROM is read-only. This means that the data inside ROM is fixed. It can only be read, not written to.

ROM stores the instructions required to boot up the computer.

These instructions are called the BIOS (Basic Input Output System).

The BIOS checks the hardware is functioning and loads the operating system into RAM.



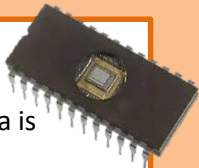
Virtual memory is an area of the hard-drive used as temporary RAM, when RAM is full.

**DISADVANTAGE**

The read-write speeds of a hard drive is much slower than RAM. Therefore it takes longer to fetch data to the CPU to be processed.

There will be a significant drop in system performance if the system has to rely heavily on virtual memory.

If the OS is constantly swapping data between RAM and the hard drive, programs will run more SLOWLY. *This is called disc thrashing.*



RAM stands for Random Access Memory.

RAM is volatile, this means that without power, data is lost.

RAM is editable, this means that what is stored in RAM read from and written to. e.g. data moved in and out.



RAM stores the Operating System once the computer has booted up.

RAM also stores any program instructions and data that are open / running or in use.

*\*any program/app that is open on your computer system is moved into RAM.*

RAM is often removable. You can upgrade many computers by adding more RAM.



If there are too many programs open at once or a particularly memory intensive program is open, there may not be enough space in RAM to hold all of the program data.

The OS swaps out some of the data from RAM to secondary storage (hard drive) to make room for the new data.

If there was no virtual memory the OS would have to say: "Sorry, you can not load any more applications. Please close another application to load a new one."

Usually the LEAST recently used data is swapped out to virtual memory. When the data is needed again it is transferred back to RAM to be accessed by the CPU.

The more RAM a computer system has, the less virtual memory will be needed. **Adding more RAM can significantly improve the performance of a computer.**

# GCSE Computer Science - Topic 1.2 Memory

## What I need to know:

Define memory.

---

State what RAM stands for.

---

State what ROM stands for.

---

Describe the main differences between ROM and RAM.

---

Explain RAM's purpose in a computer system.

---

Explain ROM's purpose in a computer system.

---

Define virtual memory.

---

Explain why virtual memory is needed.

---

Describe the main disadvantage of using virtual memory.

---

Explain why adding more RAM could improve the performance of a computer system.

Describe the difference between volatile and non-volatile memory.

.....

.....

[Total 2 marks]

Explain why the BIOS is stored in ROM instead of RAM.

.....

.....

[2]

When many programs are running at once a computer may have to use virtual memory.

c) Explain how virtual memory works.

.....

..... [2]

d) Explain **one** disadvantage of using virtual memory.

.....

..... [2]

Fergus' computer has 8 GB of RAM. State the purpose of RAM in a computer.

.....

..... [1 mark]

Jane is using her laptop to watch a movie she has downloaded in a multimedia player.

(a) What would be held in RAM when the movie is playing?

.....

.....

.....

..... [3]

When a computer is switched on the BIOS runs. The BIOS is stored in the computer's ROM.

a) State **two** functions of the BIOS.

1 .....

2 .....

[2]



# RE Knowledge Organiser

## Religious Diversity

### Hinduism

There are four main groups in Hinduism. They are; Vaishnavism, Shaivism, Shaktism and Smartism. All of these different groups worship different Gods. For example, a Vaishnavite worships the deity Vishnu, whilst a follower of Shaivism worships the deity Shiva. Although these groups fall under the one religion of Hinduism, there are vast differences between them in terms of worship and what they emphasise in terms of importance.



### Sikhism

Sikhism consists of three major denominations; these sects in the order of importance are: Khalsa, Namdhari, Nirankari. They take different positions on the nature of Guru or spiritual teacher. Khalsa sect - to which the majority of Sikhs adhere - itself consists of three groups, which become distinguished from each other by their certain kind of clothes, life style, and some religious principles. Many Sikhs decide to show greater commitment to their religion by becoming Amritdhari Sikhs. This means they are gone through the Amrit Sanskar ceremony, which remembers Guru Gobind Singh's first Khalsa.

### Islam

The two main groups within Islam are called Sunni and Shi'a Muslims. They worship the same one god - Allah, but have different religious practises. Sunnis are the largest group of Muslims and make up 85-90% of Muslims worldwide, which is followed by Shi'a Muslims which make up another 10-15%. Sufis are not really a different group of Muslims, both Sunni and Shi'a can also be Sufi. Sufism is a very spiritual form of Islam and a Sufi is someone who dedicates themselves to religious learning in order to be closer to Allah. One main difference between Sunni and Shi'a are the key beliefs. Sunni Muslims believe in the Six Articles of Faith, whereas Shi'a Muslims believe in the Five Roots of Usul ad-Din.

### Judaism

Being Jewish is a matter of belonging to the wider population of Jewish people sometimes called Jewry. Practising Judaism is a matter of embracing the Jewish religion and being a religious Jew. Historically, the Jewish people who have spread from the homeland of Israel has adapted their own customs and traditions to the local culture. Jewish people who settled in Spain, Portugal, North Africa and the Middle East are known as Sephardim. Jews from people from France, Germany and Eastern Europe are Ashkenazim. Differences between the groups relate to religious laws are followed and festival customs.

### Christianity

There is a great deal of Diversity within Christianity, as there are numerous denominations including Catholicism, Protestantism and Orthodox. Each one has their own views towards certain issues or aspects of the way Christians should live their lives. One example of this is marriage. Catholics believe that once a person is married, they cannot divorce, whereas Protestants believe that a person can choose to divorce another if they so wish. The spread of Christianity as a percentage of the population is varied too. Latin America is 85% Christian, with North American and Europe following on 77 and 76% respectively.



### Buddhism

During the Buddha's life, his teachings were not written down, but his faithful bhikkhus were able to remember them and recite them word for word. After his death his followers met as a council to agree an accurate version of his teachings. Due to disagreements over this two groups formed, the Theravada and the Mahayana. These two groups differ in many ways, they spread and settled in different areas and focused on different aspects on the Buddha's teachings. Some of the scriptures used by each group are written in different languages, with the Theravada scriptures written in Pali and some of the Mahayana scriptures written in Sanskrit.

## KEY VOCABULARY/TERMS

Denomination, Catholic, Protestant, Schism, Orthodox, Liberal, Masorti, Reform, Sephardim, Ashkenazim, Sunni, Shi'a, Sufi, Theravada, Mahayana, Shaivism, Vaishnavism, Shaktism, Smartism, Khalsa Sikh

### Quiz questions

What are the four main groups in Hinduism?

What does the Amrit Sanskar ceremony remember?

What percentage of Latin America is Christian?

Give 3 locations where Ashkenazim Jews have settled

What language are the Theravada scriptures written in?

Give three Christian denominations

Which is the most important Sikh sect?

Which denomination of Islam is the largest?

Which denomination of Islam believes in the Five Roots of Usul Ad-Din?

How many denomination are there in Sikhism?

Give 4 locations where Sephardim Jews have settled

Which Buddhist scriptures are written in Sanskrit?

When were the Buddhist teachings first written down?

Give one difference between Catholic and Protestant beliefs

Which group of Hindus worship Shiva?

Vaishnavite Hindus worship which deity?

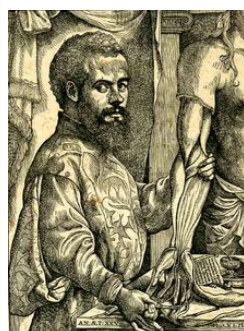
Which country is the Jewish homeland?

Name two groups of Buddhists

# History Knowledge Organiser

## Britain: Health and the People 2. The beginnings of change.

### Key individuals



Andreas Vesalius



Ambroise Paré



William Harvey



John Hunter



Edward Jenner



Thomas Sydenham

#### Other key people

- William Clowes
- Nicholas Culpeper
- Lady Mary Wortley Montagu

### Impact of the Renaissance on Britain

Through careful observation and dissections **Vesalius** proved that some of Galen's findings were wrong. This encouraged people to question the knowledge used for 1400 years. His books inspired the work of people in England.

**Paré** was a surgeon who changed ideas about surgery and cauterisation. He ran out of cautery oil and used Vigo's oil of roses, egg yolk and turpentine mixture. He found they slept well and their wounds healed quickly. He also used ligatures and made false limbs.

**Harvey** investigated and proved that the heart acted as a pump, that blood circulated rather than being burned up and that veins had one way valves. It was 50 years before the University of Paris taught his ideas. His discovery was not immediately useful without further scientific discovery.

### Dealing with disease

King Charles was given 58 drugs some of which would have contributed to his death. Ordinary people still went to barber-surgeons, apothecaries, wise women and quacks. New medicines were being brought back on voyages of discovery. The Great Plague hit again in 1665 and there was still no cure. In the 18th century hospitals began to be built. John Hunter the scientific method and collected anatomical specimens for his collection.

### Prevention of disease

Inoculation - giving a weakened form of live germs to build up immunity. It could be fatal but had been the most popular method of dealing with smallpox. Jenner had noticed that milkmaids did not get smallpox but did get cowpox. From this developed a vaccination from the latin vacca - cow. He could not explain his findings scientifically so his ideas were not embedded until a £10,000 research grant from parliament in 1802. In 1853 vaccination was compulsory.

### Key dates

1400s	The Renaissance - a period of history when there was a 'rebirth' of ancient Greek and Roman ideas.
1525	Vigo published Of wounds in General
1543	Vesalius published The Fabric of the Human Body
1575	Paré published Works on Surgery
1588	William Clowes published Proved Practice
1628	Harvey published De Motu Cordis
1665	The Great Plague
1685	King Charles II died
1796	Edward Jenner's cowpox vaccination

### KEY VOCABULARY/TERMS

Renaissance, anatomy, blood, illustrations, Barber-Surgeons, Bec de Corbin, cauterisation, ligature, surgery, amputation, oil of roses, egg yolk, turpentine, circulation, arteries, veins, valves, quack, purgative, emetic, enema, Great Plague, watchmen, searchers, quarantined, epidemic, leeches, poisoned air, apothecary, hospitals, dispensary, specimens.

# History Knowledge Organiser

## Britain: Health and the People Medicine stands still.

### Questions \*based on your key people knowledge organiser

### Answers

1	Who was Andreas Vesalius?*	
2	Who was Ambroise Paré?*	
3	Who was William Harvey?*	
4	Who was John Hunter?*	
5	Who was Edward Jenner?*	
6	What does the word renaissance mean?	
7	How long had Galen's work been followed for?	
8	What was the name of Vesalius' book?	
9	What was Paré's new mixture made from?	
10	Who did he get the idea from?	
11	What was the name of Paré's book?	
12	What was the name of Harvey's book?	
13	How many different medications were given to King Charles I?	
14	When did the Great Plague hit Britain?	
15	What was inoculation?	
16	What does the Latin word 'vacca' mean?	
17	How much money was Jenner given as a research grant?	
18	When did Smallpox vaccination become compulsory?	
19	Where did ordinary people go for treatment?	
20	Where were new medicines discovered and brought back to Britain?	

# History Knowledge Organiser

## Britain: Health and the People 4. Modern medicine.

### Key individuals

Alexander Fleming, Howard Florey, Ernst Chain, Karl Landsteiner, Wilhelm Rontgen, Albert Hustin, Harold Gillies, Archibald McIndoe, Dwight Harken, William Beveridge, Aneurin Bevan - Minister of Health who introduced the NHS. Christian Barnard, Francis Crick and James Watson - discovered DNA, Roy Calne - anti rejection drugs.

### Treatment of disease

In 1928 Alexander Fleming was working to find a way to kill the staphylococcus germ. He found penicillin by chance after leaving petri dishes out whilst on holiday. When he came back he noticed that a mould had grown which killed the bacteria. He published his findings about the first antibiotic but did nothing else with it. Ernst Florey and Howard Chain read the article and asked the British government for funding but got only £25. They tested it on policeman Albert Alexander who had an eye infection. It worked until they ran out of penicillin. When America joined WW2 the gave \$80 million to develop and mass produce penicillin. By the time of the D-Day landings there was enough to treat the casualties. Other antibiotics followed; streptomycin, tetracycline, mitomycin. In recent years however there are antibiotic resistant bacteria due to overuse including MRSA. Today there are also a variety of alternative treatments including acupuncture, homeopathy and aromatherapy. Vaccines for diphtheria, whooping cough, polio, rubella, MMR and HPV are now available for all.



### Key dates

1895	X-ray
1899	Boer War
1906	Liberal Reforms, Free School Meals
1907	School medical service
1908	Children and Young Persons Act, Old Age Pension
1909	First job centres
1911	National Insurance Act
1914-18	WW1 Albert Hustin and storage of blood
1921	Over 5000 patients had plastic surgery
1928	Penicillin discovered
1942	Beveridge Report
1948	NHS introduced
1953	DNA discovered
1967	First heart transplant
1978	First IVF baby Louise Brown
1978	Smallpox eradicated
2006	Public smoking ban
2008	First full face transplant
2015	Smoking ban extended to cars

### Impact of war and technology on surgery

WW1 was on a scale previously unseen with new injuries caused by new weapons. X-rays had been discovered in 1895 by Wilhelm Rontgen but portable machines could help doctors find shrapnel and look for broken bones without cutting people open. The Army Leg Splint was designed to put broken bones in traction. Infections such as gangrene were common so surgeons cut away the infected flesh and soaked the wound in saline. Shell shock was identified during the war after the suffers originally being treated as cowards. Today it is known as PTSD. Karl Landsteiner had discovered blood groups which helped doctors complete blood transfusions. In 1914 Albert Hustin discovered that glucose and sodium could stop it clotting on contact with air meaning it could be bottled. In 1938 advances in storage mean the National Blood Transfusion Service opened. Harold Gillies developed plastic surgery to help men who suffered severe facial wounds during WW1 by 1921 he had treated over 5000 servicemen. In WW2 his cousin Archibald McIndoe did further work on faces and hands. Heart surgery progressed through Dwight Harken who operated on 134 hearts with no fatalities. Since the war there have been kidney, heart, lung, liver and facial transplants. These became more successful with cyclosporine to stop organ rejection. DNA and stem cells are being mapped and used to grow new organs.

### Public Health



By 1900 poverty was still an issue in Britain. This was highlighted by the Boer War of 1899-1902. 40% of the men who volunteered were not fit for military service mostly due to poor diet and poverty-related illnesses. This was supported by the work of Booth and Rowntree. Booth studied London and created a map showing the distribution of poverty across London. In his book 'Life and Labour of the People in London' he wrote that 30% of the population lived in poverty despite many working. In York Seebohm Rowntree discovered that 28% of the population were in poverty but also that this could change during their lifetime. This he displayed in his poverty line. These concerned the government as did rivalry from nations including Germany and the USA. The new political party Labour was aimed at working people so something had to be done to win working votes. The Liberal Party came to power in 1906. They introduced; 1906 - Free School Meals, 1907 - School medical service, 1908 - Children and Young Persons Act, The Old Age Pension, 1909 - first job centres, 1911 - the National Insurance Act. These provided a safety net for children, the old, the sick and the unemployed. WW1 and WW2 highlighted that there was still more to be done. In 1942 the Beveridge Report said that people had the right to be free of the 'five giants' that could ruin their lives. Disease, want (need), ignorance, idleness, squalor (very poor living conditions). After the war the Labour Party set up the Welfare State to care for people 'from the cradle to the grave'. The NHS began in 1948 initially with completely free health care. A weekly child care payment, benefits for the very poor and slum clearance were all part of this. The NHS budget in 2015-2016 was £116 billion. In the C21st the government continues to try and improve health - 2006 a smoking ban was passed in public places extended to cars in 2015.

### KEY VOCABULARY/TERMS

staphylococcus, penicillin, bacteria, antibiotics, x-rays, shrapnel, splint, infection, gangrene, shell shock, PTSD, blood transfusion, plastic surgery, transplan, cyclosporine, organs, Boer War, poverty, Liberal Reforms, Free school meals, Labour party, Old Age Pension, National Insurance Act, unemployed, disease, want, ignorance, squalour, Welfare State, NHS, slum clearance, budget, smoking ban.

# History Knowledge Organiser

## Britain: Health and the People 4. Modern medicine.

### Quiz questions

1. Which war identified problems with the health of the British people?

2. Which two men collected evidence about poverty in London and York?

3. What acts did the Liberal government introduce to improve the health of the public?

4. Which invention of 1895 was used to find shrapnel in WW1 and who discovered it?

5. What advancement did Albert Hustins make during WW1?

6. Which two men developed plastic surgery in WW1 and WW2?

7. How did heart surgery advance during WW2?

8. Who found penicillin, when and how?

9. Who developed penicillin, when and how?

10. What is penicillin the first of?

11. Which report was written during WW2 and what was its significance?

12. When did the NHS begin?

13. When was the first heart transplant and was it successful?

14. What other types of transplant have been done since?

15. When was DNA discovered?

16. What is antibiotic resistance and why is it a challenge for modern medicine?

17. What examples of alternative medicines are there?

18. Which modern health policy was introduced in 2015?



## 1 - Global atmospheric circulation

**At 0°** (the Equator) - Air is hot and so holds lots of water vapour. Air rises causing low pressure and daily rain.

**TRADE WINDS** - east towards 0°

**At 30°** - Cooled dry air is sinking creating high pressure, winds and no precipitation. Hot as sun's rays are concentrated.

**WESTERLIES** - west towards 60°

**At 60°** - Rising air causes low pressure, clouds and precipitation. Temperatures are lower as sun's rays are less concentrated.

**POLAR EASTERLIES** - towards 60°

**At 90°** (the poles) - sun's rays are much less concentrated so temperatures are lower. Sinking air leads to high pressure, winds and no precipitation.

**Winds** move from high to low pressure and curve due to the Coriolis effect.

## 2 - UK weather hazards

### Weather hazards:

Rain, wind, snow and ice, thunderstorms, hailstorms, heat waves, drought.

### Problems caused:

Damage to property, damage to crops, disruption to transport, fires, flooding, health problems, disruption to services and utilities.

### Example:

Storm Ciara, 9th February 2020  
Strong winds and heavy rain  
2 dead, 4 000 homes flooded, transport disrupted, £200 million insurance claims, trees uprooted, river banks eroded.

### Evidence of weather becoming more extreme:

**Temperatures** - 2022 was the hottest year on record.

**Precipitation** - Six of the ten wettest years have occurred since 1998.

## 3 - Tropical storms

### Where:

In the tropics, between 5° and 30° north and south of the equator - not on the equator as coriolis effect is too weak.

### When:

During summer and autumn when ocean temperatures are above 27° C making air unstable.

### Movement:

Track from east to west away from the equator in line with trade winds.

### Impact of climate change:

May become more widespread, stronger and more frequent.

### Features:

Low pressure system  
Increasing clouds, rain and wind towards the centre.

Eye (central area) completely calm with no rain or wind as cold air is sinking.

## 4 - Climate change

### Evidence:

Ice and sediment cores, pollen analysis, tree rings and historical weather records.

### Causes:

**Natural** - Changes in orbit, volcanic activity and solar output.

Increased energy reaching Earth from the sun leads to temperature increases.

**Human** - Use of fossil fuels, agriculture and deforestation.

Increases in greenhouse gases lead to increased temperatures as more of the sun's energy is trapped in the atmosphere.

### Impacts:

**Environmental** - melting ice sheets and sea ice, sea level rise, bleaching of coral reefs, changing weather patterns.

**Human** - increased deaths and migration, droughts, reduced crop quality and yields.

## 5 - Key terms

**Coriolis effect** - An apparent force experienced due to the spin of the Earth.

**Drought** - a period of abnormally dry weather

**Utilities** - A service used by the public

**The tropics** - area surrounding the equator between the Tropic of Cancer and the Tropic of Capricorn.

**Greenhouse gas** - gases in the Earth's atmosphere which trap heat. Carbon dioxide and methane



## 1 - Global atmospheric circulation

What weather conditions are associated with the Equator (0°)?

Which direction do the Trade Winds blow towards? ?

Why is it hot at 30°?

Describe the atmospheric conditions at 30 .

Describe how westerlies travel

At 60°, what happens to the air?

What direction do the Polar Easterlies move?

Describe the atmospheric conditions at the poles (90°).

How does the Coriolis effect influence the path of winds ?

What direction do all winds move in?

## 2 - UK weather hazards

Name four weather hazards which occur in the UK

. List three problems caused by weather hazards in the UK.

Name an example of an extreme weather event in the UK.

Describe the impacts of a specific an extreme weather event in the UK.

Which year was identified as the hottest year on record in the UK?

How many of the ten wettest years in the UK have occurred since 1998?

How much did insurance claims amount to as a result of Storm Ciara?

What type of weather event can lead to disruption in transport and utilities in the UK?

## 3 - Tropical storms

Where do tropical cyclones typically form?

When does the formation of tropical cyclones occur?

What is the primary factor contributing to the instability of the air for tropical cyclone formation?

How does the movement of tropical cyclones relate to the trade winds?

What potential impact is climate change expected to have on tropical cyclones?

What are the main features of a tropical cyclone?

What is the weather like in the eye of a tropical cyclone?

How doe weather conditions change as a tropical storm passes an area?

## 4 - Climate change

What types of evidence are used to prove climate change happens?

Name one natural cause of climate change.

How does increased solar energy reaching Earth affect temperatures?

Name one human-related cause of climate change.

How do increased greenhouse gases contribute to rising temperatures?

What are some environmental impacts of climate change?

State one human impact of climate change.

How does climate change affect coral reefs?

How is climate change affecting crops?

## 5 - Key terms

What is the coriolis effect?

What causes the coriolis effect?

What is a drought?

What are utilities?

What are the names of the tropics?

Where are the tropics located?




What do greenhouse gases do?

Give two examples of greenhouse aases.



**INNOVATION**

### STILL LIFE ARTISTS

	<p style="text-align: center;"><b>Vincent Van Gogh</b></p> <p>Vincent van Gogh is generally considered as one of the greatest painters. He was a member of the Post-Impressionist group of artists and his images were a big influence on many modern day artists. He suffered from a serious mental illness and it was said that this illness heavily influenced his use of bold striking colours and heavy textured brushstrokes.</p>	<p style="text-align: center;"><b>Sarah Graham</b></p> <p>Sarah Graham is a Realist painter who creates lively, colourful and bold images. Striking realism combined with vivid colours allows her to display the subject matter of toys and sweets to be conveyed in such an accurate way.</p>	<p style="text-align: center;"><b>Gerald Murphy</b></p> <p>Murphy's style of work reflects the bright, clear style of poster design in the late twenties, which were based on clean, bright colours and sharp edged images. Murphy decided to reject the portrayal of natural images and concentrate on the beauty of modern machine made objects. In some instances it could take him a year to complete two pictures.</p>
	<p>He did not restrict his paintings to one particular theme and showed an ability to develop various images such as portraits, still life and landscapes. His strong brushstroke style was evident in all of his work, where he would use the paint to emphasise shapes and give a sense of tension to his work. The majority of his most well known paintings were produced in a short time period of only ten years.</p>	<p>Working from photographs, Sarah will arrange a composition in her studio and take up to 200 hundred photos before getting the right one. From this image she will sketch the outline in yellow paint on the canvas. This creates the basis for the painting and the adding of colour can begin. Sarah works in oil as they lend themselves well to her style of painting. They allow her to "blur" the paint recreating the blurred effect seen in a photograph.</p>	<p>When developing his images, he broke down the form of the objects into a few colours, simple shapes and machine-like patterns. He forgot about space, depth and tone and became more interested in the abstract qualities of the objects, the shape of the letters and the graphic patterns that they made. During his career, he actually only completed a few images.</p>
	1853 - 1890	Born – 1977	1888 - 1964

### KEY VOCABULARY

**Still Life** – A drawing or painting of items such as fruit, flowers and household objects which are usually arranged on a table top.

**Photo Realism** – An art technique in which the artwork appears incredibly realistic

**Proportion** – The size and shape of one object compared to others.

### ASSESSMENT CRITERIA

- ASSESSMENT OBJECTIVE 1 - Develop ideas through investigations, demonstrating critical understanding of sources.
- ASSESSMENT OBJECTIVE 2 - Refine work by exploring ideas, selecting and experimenting with appropriate media, materials, techniques and processes.
- ASSESSMENT OBJECTIVE 3 - Record ideas, observations and insights relevant to intentions as work progresses.
- ASSESSMENT OBJECTIVE 4 - Present a personal and meaningful response that realises intentions and demonstrates understanding of visual language.

**Write 3 relevant facts about each artist**

Van Gogh:

Graham:

Murphy:

**Write the definitions for these words**

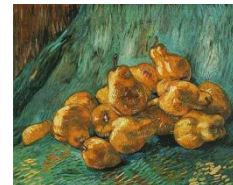
Still Life –  
Photo Realism –  
Proportion -

**Write about your likes/dislikes of the different artist's work**

Van Gogh:

Graham:

Murphy:



# R185 | PERFORMANCE AND LEADERSHIP IN SPORTS ACTIVITIES

## TOPIC AREA 2

### Applying practice methods to support improvement in a sporting activity

#### Strength and weaknesses

##### Basic skills needed in netball



##### Basic tactical skills needed



##### Strengths

One of my strengths is my footwork as I am able to land both one and two footed while maintaining balance with the ball.



##### Weakness

One of my weaknesses is my defending as I get too close to attacking players (>0.9m), giving away a penalty to the other team.



#### Different types of practices and progressive drills

##### Whole

The whole skill is performed at once (e.g. full sprint start).



##### Part

The skill is broken down into parts which are practised separately (e.g. just the 'set' phase in the sprint start)



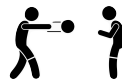
##### Variable

The skill is practised in the range of different situations that could be experienced in a performance e.g. adding defenders and goal keepers in a shooting drill.



##### Fixed

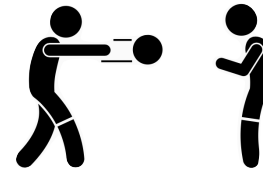
A specific skill or technique is repeatedly practised in the same way e.g. A chest pass drill with a partner.



##### Progressive practices/drills

Drills/practices that show a clear increase in difficulty, dependent on the ability of the performer. For example a progressive practice/drill in basketball could be:

###### 1. A basic chest passing drill



###### 2. Passing while on the move



###### 3. Passing with a defender



#### Alternating the context

##### Alternating the context of performance

Changing the circumstances in which a performer is training e.g. Training with more experienced players to increase skill or knowledge. The context can also be changed by adding defenders into practices.

#### Measuring improvement

##### Video analysis

To identify weaknesses and how performance can be improved.

##### Other assistive technology

To improve performance, such as quantitative activity trackers.

##### Monitoring competition results

Over a period of time.

*Tools selected will be dependent on the chosen activity and the ability level of the performer.*

# 10 KEY QUESTIONS

## Topic Area 2 | Applying practice methods to support improvement in a sporting activity

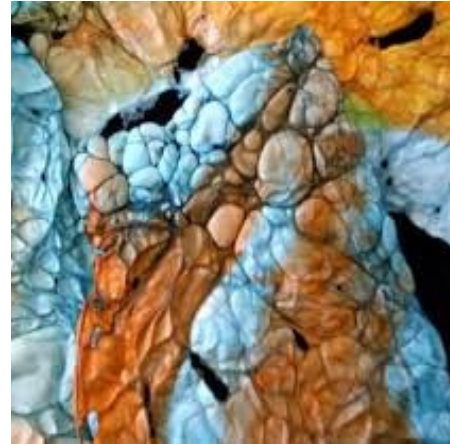
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- 1 What are the basic skills in netball?
- 2 What are the basic tactical skills needed in netball?
- 3 Name 5 key skills in a sport of your choice.
- 4 Name 3 tactical skills needed in a sport of your choice.
- 5 Identify and describe a strength in a sport of your choice.
- 6 Identify and describe a weakness in a sport of your choice.
- 7 Give an example of each type of practice in sport of your choice.
- 8 Give an example of an progressive drill or practice in sport of your choice.
- 9 Give 2 ways in which you can alter the context of performance.
- 10 Identify and example now to measure improvement in sports performance.

**Extension  
Task(s):**



**Research all the different types of skills and drills in a sport of your choice on the sports plan we**



### 3D Puff Binder

**Puff binder** is a paste that gives a 3D effect to fabric. It can be screen printed on or hand painted on. Once it has been applied to fabric it needs to be heated up to create the "**puff**" effect.

### Honeycomb smocking

This is a technique to create surface pattern and texture. Fabric is stitched in a grid pattern and then gathered to create a pleats in a honeycomb pattern.

### Crashing technique

Water soluble fabric is stitched onto lightweight fabric. It is usually then stitched in a circle pattern using free machine embroidery. The iron is then used to steam the fabric, the steam causes the fabric to shrivel up and create texture on the surface.

### Stitch and slashing

Involves stitching together two or more layers of fabric one on top of the other in parallel diagonal lines (bias) and then cutting through the top layers leaving the base layer intact. This is then stitched into to create pleats

Complete the following tasks in your reflection log.

Describe what 3D puff binder is.  
What is needed to activate the 'puff' effect?

Describe honeycomb smocking.

Which technique uses water soluble fabric?

Which technique uses layers of fabrics that have been cut into?

Why is it important to show a range of techniques in your work?

**Extension task: use the internet to research additional decorative techniques that can be used to create texture on fabric.**

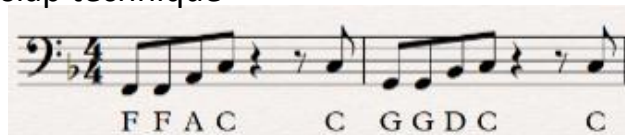


# Music Knowledge Organiser

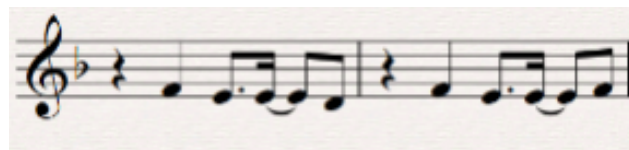
## Paul Simon 'Call Me Al'

**Context:** The title for this song came about from an incident at a party that Paul Simon attended with his first wife, Peggy Harper. Also present at the party was the French composer who inadvertently referred to Paul Simon as 'Al' and Peggy as 'Betty'. The first part of the song appears to be describing a man going through a mid-life crisis and reflecting on his life – 'Why am I soft in the middle? Where's my wife and family? What if I die here? Who will be my role model?' As the song progresses, by the third verse the theme becomes more biographical, reflecting on Paul Simon's travels to South Africa.

Bass riff (0:00) 2 bar repeated pattern, slap technique



Brass/sax riff (0:00) 2 bar repeated pattern



<b>Tonality</b>	F major: F (I), Gm (ii), Bb (IV), C (V)
<b>Rhythm</b>	Syncopation, syllabic speech-like rhythms, short value notes in the melody, offbeat, semiquavers, sextuplets, grace notes, drum fill

Section	Timing	Content
<b>Intro</b>	0:00-0:14	Brass and saxophone <b>stepwise riff, (homophonic texture)</b> with Bass riff F,C, Bb
<b>Verse 1</b>	0:15-0:43	2x 8 bars. B1-16 solo, spoken and <b>syllabic</b> . B17-24 <b>doubling</b> octave lower. F,C,Gm
<b>Chorus 1</b>	0:44-0:59	Sung with brass and sax riff from introduction. F,C, Bb
<b>Verse 2</b>	1:00-1:28	As verse 1
<b>Chorus 2</b>	1:29-1:45	As first chorus but with different high ending
<b>Penny whistle solo</b>	1:46-2:15	<b>Starts on 2nd quaver (off beat)</b> . Folk style. <b>Semiquavers, sextuplets, grace notes</b>
<b>Middle 8</b>	2:16-2:29	Brass/sax riff from introduction (homophonic)
<b>Verse 3</b>	2:30-2:58	As verse 1 and 2
<b>Chorus 3</b>	2:59-3:13	As second chorus
<b>Verse 4</b>	3:14-4:02	Repeated 'na-na' and humming
<b>Instrumental Break</b>	3:44 - 3:47	<b>Fretless bass solo - fast semiquavers and wide range of pitch. Slap bass technique.</b>
<b>Outro</b>	3:47 - end	Fragments of chorus and brass/sax riff introduction with <b>falsetto</b> oohs until <b>fade out</b>

**Instrumentation/Sonority - mixture of African and American musicians/singers;**

- Guitar
- Fretless Bass
- Drums
- Percussion
- Synthesizer
- Six string electric bass
- Guitar synthesizer
- Bass/baritone saxophone
- Trumpets
- Trombones
- Penny Whistle
- Background vocals

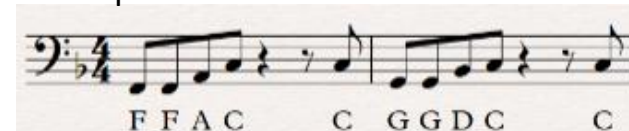


### QUESTIONS

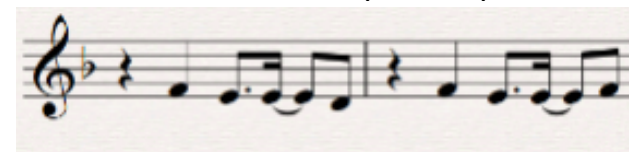
1. Identify the form and structure of 'Call Me AI'.
2. Identify the key of the song?
3. Which instruments play riffs?
4. What playing technique is used by the bass guitar?
5. Identify two melodic features in 'You Can Call Me AI'.
6. Which style of music has influenced this song? Give examples.
7. Identify two rhythmic features in 'You Can Call Me AI'.
8. How does the song end?
9. Explain how the elements of **melody, sonority and texture** add interest and variety to 'You Can Call'. (8 marks)

### NOTATE AND PLAY

Bass riff - 2 bar repeated pattern, slap technique



Brass/sax riff - 2 bar repeated pattern



### Structure

Can you remember the structure of the song? Can you identify the key features of each section?  
Draw a table and test yourself.

### VOCABULARY - Can you define what each of these terms mean?

BASS RIFF    BRASS/SAX RIFF    STEPWISE    F MAJOR    PENNY WHISTLE    BRIDGE    MIDDLE 8    DOUBLING  
OCTAVE    HOMOPHONIC TEXTURE    SLAP BASS    SEMIQUAVERS    PHRASE    SEXTUPLET    GRACE NOTES  
SYNTHESISED    RANGE OF PITCH    2ND QUAVER OF THE BAR    OFFBEAT    FADE OUT    SYLLABIC    FALSETTO

## Composition in Graphic Design

**Composition** in graphic design is where all information is placed on a page focussing on the importance of the information and the clarity of how the page looks. Designers need to consider what is the focal point of the page, what graphics stand out the most, symmetry and negative space.

**Proximity** – Is the process of placing all related information and imagery together on a page. Unrelated items should be spaced apart.

**White space** - refers to the empty space on a page. If the design is a confined and cluttered, then adding white space can add focus to the important information however, too much white space can leave the audience bored.

**Alignment** – This is where Information and imagery are placed in line with each other. It is important that the alignment is consistent as it adds clarity and professionalism to the work.

**Contrast** – is when two opposing colours or tones are used to help information or imagery stand out more. It also gives a greater balance to the page.

**Repetition** - is the process of repeating elements throughout a design, to give a unified look. You can think of it as adding consistency to a design.

**Hierarchy** – This is where information is organised in order of importance. Examples of this are titles and headlines.

### Proximity



### Contrast



### White space



### Repetition



### Alignment



### Hierarchy



## KEY VOCABULARY

**Composition, Proximity, White space, Alignment, Contrast, Repetition, Hierarchy.**

## ASSESSMENT CRITERIA

**Competence** - How you complete and improve your work using the project activities.

**Technical ability** – Experiment the different components of composition to develop a successful graphic design for Unit 2.

## Composition in Graphic Design

Why is proximity important in composition?  
.....  
.....

What does white space add to a graphic design?  
.....  
.....

What does alignment add to a graphic design?  
.....  
.....

How does contrast help a graphic design work well?  
.....  
.....

What kind of look does repetition give a graphic design?  
.....

Give two examples where Hierarchy is used?  
.....

**Give three areas of graphic design where composition is especially important.**

- 
- 
- 

**Create a poster to advertise the next Unity Academy 'Reading Rocks' festival. (in the space below)**  
**Include all of the important components of composition. Proximity, White space, Alignment, Contrast, Repetition and Hierarchy.**



