

# Biology Topic 3: Infection and response

1. Keywords	
Communicable (infectious) disease	A disease which can be spread to others.
Pathogen	Micro-organisms that cause infectious disease (eg bacteria, protists, fungi and viruses).
Bacteria	Prokaryotic cells. Some can cause disease by making toxins.
Protists	Eukaryotic cells. Some can cause disease.
Fungi	Class of organisms that includes mushrooms. Some can cause disease.
Virus	The smallest organisms. Much smaller than bacteria. They reproduce inside host cells damaging them and causing disease.
Droplet inhalation	When a disease is spread through coughs and sneezes.
Direct contact	When a disease is only spread from physical contact.
Antibiotics	A group of chemicals which can kill bacteria (eg penicillin).
Antiviral drugs	A group of chemical which can prevent viruses reproducing. Hard to develop safe ones.
Fungicides	A group of chemicals which kill fungi.
Painkillers	A type of drug that treats pain symptoms but does not kill pathogens.
Lymphocyte	White blood cell.

2. Examples of infectious disease						
	Disease	Infects	Symptoms	Spread by	Fatal	Treatment
Virus	Measles	Human	Fever Skin rash	Droplet inhalation	Yes	vaccination
	HIV	Human	Reduced immune system	Unprotected sex	Yes	Antiviral drugs
	Tobacco mosaic virus (TMV)	Plants	Discolours leaves Stunts growth	Direct contact	No	Remove infected leaves and burn
Bacteria	Salmonella	Human	Fever Stomach cramps Vomiting Diarrhoea	Food	No	Take fluids to prevent dehydration
	Gonorrhoea	Human	Thick yellow/green discharge from vagina or penis	Unprotected sex	No	Antibiotics (if not resistant)
Fungal	Rose black spot	Plants	Black spots on leaves Stunts growth	Direct contact	No	Fungicides
Protist	Malaria	Human	Fever	Mosquito bite	Yes	Drugs to kill/prevent parasite. Prevention by using nets to stop bites

3. Non-specific defence systems	
Skin	Physical barrier
Nose	Hairs trap pathogens
Trachea and bronchi	Mucus traps pathogens
Stomach	Acid destroys pathogens

4. Specific defence by white blood cells	
Phagocytosis	Ingesting (take in) pathogens digesting and destroying them
Antibody production	Target a specific pathogen. Stick them together and target them for destruction. Gives you a 'memory' of that pathogen so you can fight it more quickly next time
Antitoxin production	Cancel out toxins released by pathogens

5. Vaccination	
Vaccine	Small amount of dead or inactive pathogen to stimulate white blood cells to produce antibodies
How vaccines work:	
1	Weak or dead pathogen injected
2	White blood cells generate antibodies to destroy pathogen
3	White blood cells that make those antibodies remain and make you immune to future infections

6. Drug development			
Drug/medicine	A chemical which alters the body. Often extracted from plants (eg aspirin) and microorganisms (eg penicillin)		
Toxicity	If it is toxic		
Efficacy	How well it works		
Dose	How much of a drug you need to take to make it work		
Placebo	A pill without the drug in it. Taken to check drug effectiveness		
Double blind trials	When the doctor does not know if they are giving the medicine or a placebo. Prevents bias		
Stages of drug development			Time taken (yrs)
1	Drug discovery	New possible medicines are identified	4.5
2	Preclinical trials	New drugs are tested in lab for toxicity and efficacy on cells, tissues and sometimes animals	1.5
3	Clinical trials	Low doses tested on human volunteers. Then patients suffering with the disease over 3 phases. These are double blind trials	5.5
4	Publishing results	Findings are checked by other scientists (peer review) Drug is approved by NHS	1.5

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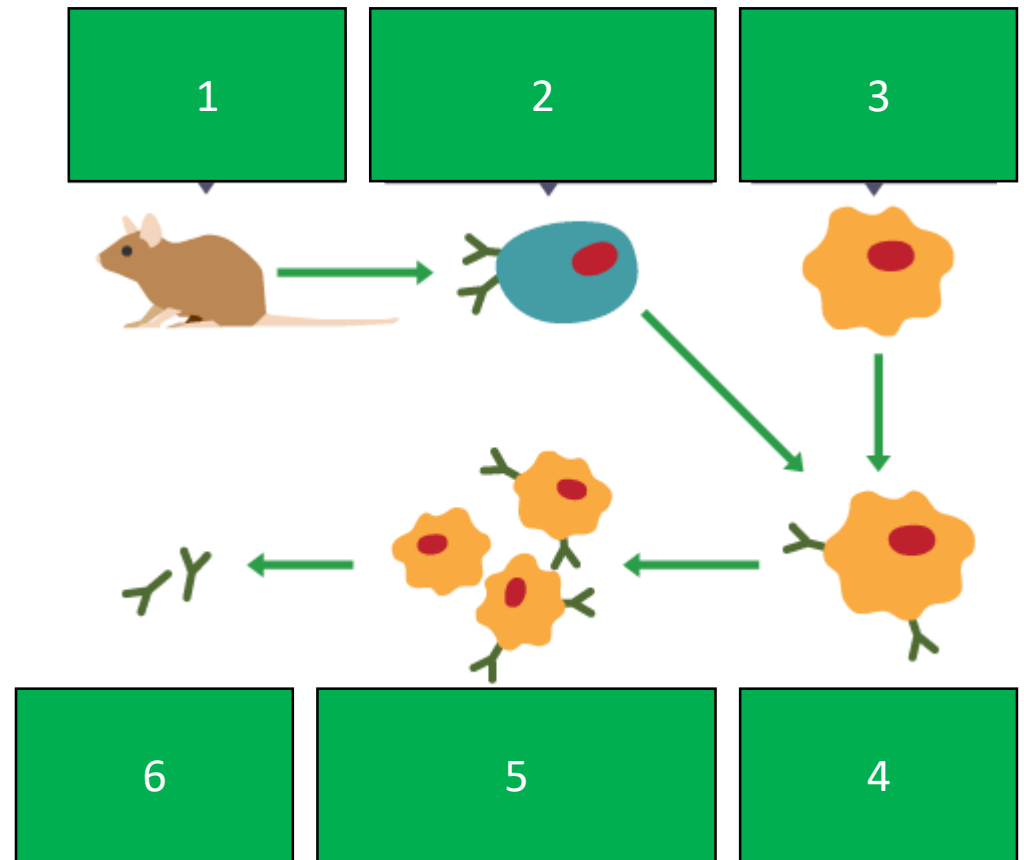
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## 7. Monoclonal antibodies (HT TRIPLE ONLY)

What are they?	Antibodies produced from a single clone of cells.
Why are they useful?	Bind to only on binding site on a specific chemical or cell in the body
Uses	Pregnancy tests Measure levels of hormones or other chemicals in blood Locate specific molecules in cells Treat cancer

### How are monoclonal antibodies made?

1	Mouse vaccinated to start production of antibodies
2	Lymphocyte: Produce antibodies but cant divide
3	Tumour cell: No antibodies but divides
4	Cells fused to form a single hybridoma
5	Single hybridoma cell cloned to make identical cells
6	A large amount of identical antibodies collected



## 8. Detecting plant disease (HT TRIPLE ONLY)

Symptoms:	<ul style="list-style-type: none"> <li>Stunted growth</li> <li>Spots on leaves</li> <li>Areas of decay</li> <li>Growths</li> <li>Malformed stems and leaves</li> <li>Discolouration</li> <li>Presence of pests</li> </ul>	Identified by:	<ul style="list-style-type: none"> <li>Reference to book or internet</li> <li>Taking to a lab</li> <li>Testing kits containing monoclonal antibodies</li> </ul>
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### 9. Plant disease (TRIPLE ONLY)

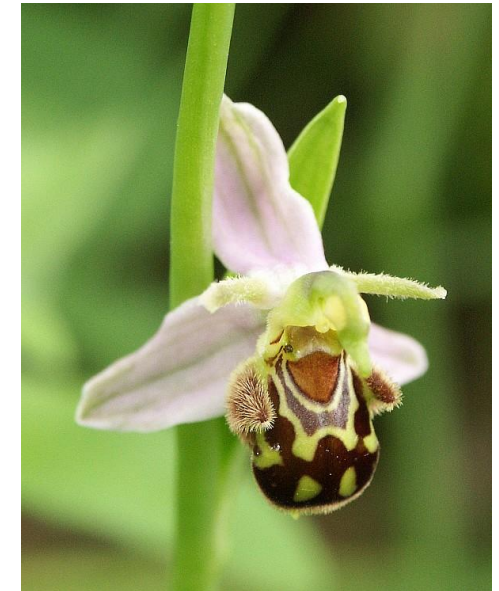
Type	Disease	How it damages plants
Pest	Aphid	A insect which injects toxins into plants as they eat them
Fungal	Black spot	Damages leaves
Virus	Tobacco mosaic virus	Damages leaves

### 10. Plant mineral deficiency (TRIPLE ONLY)

Mineral	Symptom	Reason
Nitrates	Stunted growth	Cant make enough protein
Magnesium	Chlorosis: yellow leaves	Cant make enough chlorophyll

### 11. Plant defence responses (TRIPLE ONLY)

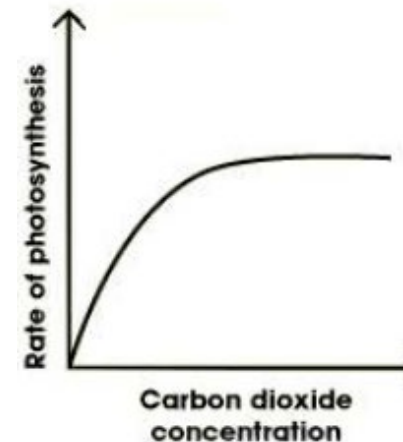
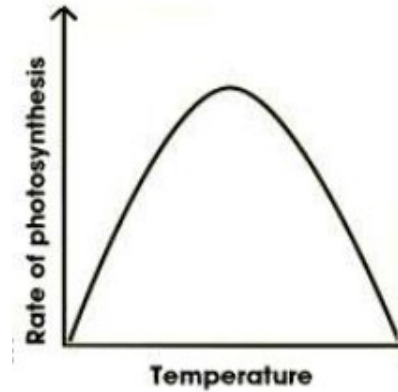
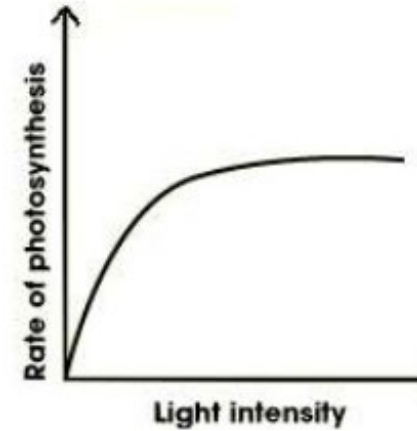
Type	Examples
Physical	<ul style="list-style-type: none"> <li>Cellulose cell wall</li> <li>Waxy cuticle on leaves</li> <li>Layers of dead cells (bark on trees)</li> </ul>
Chemical	<ul style="list-style-type: none"> <li>Antibacterial chemicals</li> <li>Poisons to stop animals</li> </ul>
Mechanical	<ul style="list-style-type: none"> <li>Thorns and hairs stop animals</li> <li>Leaves which droop or curl when touched</li> <li>Mimicry to trick animals</li> </ul>



[Bee orchid](#) flower resembles a female bee closely enough to attract males in search of a mate

# Biology Topic 4: Bioenergetics

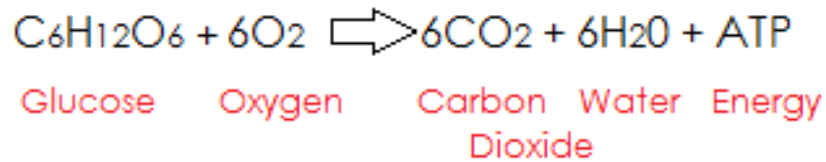
1. Photosynthesis	
$6\text{CO}_2 + 6\text{H}_2\text{O} \xrightarrow[\text{Chlorophyll}]{\text{Sunlight}} \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$ <p>Carbon Dioxide + Water <math>\xrightarrow[\text{Chlorophyll}]{\text{Sunlight}}</math> Glucose + Oxygen</p>	
Photosynthesis	An endothermic reaction where sunlight is absorbed and used to convert carbon dioxide and water into glucose and oxygen
Uses of glucose	<ul style="list-style-type: none"> <li>• Respiration</li> <li>• Converted into starch</li> <li>• Produce fat or oil</li> <li>• Produce cellulose cell walls</li> <li>• Produce amino acids</li> </ul>



2. Rate of photosynthesis		
Factor	Affect on photosynthesis	Reason
Light	Increases	More energy for the reaction
Carbon dioxide	Increases	More reactants (provided there is no limiting reactant)
Amount of chlorophyll	Increases	More energy for the reaction
Temperature	Increases then decreases	Initially more energy but then enzyme denatures
Limiting factor	The factor that can limit the rate of a reaction	

### 3. Aerobic respiration

Respiration	An exothermic reaction which continuously happens in living cells
Purpose	Transfer energy for: <ul style="list-style-type: none"> <li>• Chemical reactions</li> <li>• Movement</li> <li>• Warmth</li> </ul>
Aerobic	With oxygen



Anaerobic	Without oxygen
Anaerobic respiration in muscle cells	glucose → lactic acid
Anaerobic respiration in yeast cells (fermentation)	glucose → ethanol + carbon dioxide
Lactic acid	A chemical that when built up in muscles causes fatigue
Oxygen debt HT ONLY	The amount of oxygen the body needs after exercise to remove the lactic acid

### 4. Response to exercise

Change	Reason
Heart pumps faster	Supply more oxygenated blood to the muscles
Breathing rate increases	
Deeper breaths	

### 5. Metabolism

Metabolism	The sum of all the reactions in a cell or the body
Includes:	<ul style="list-style-type: none"> <li>• Conversion of glucose to starch, glycogen and cellulose</li> <li>• Formation of lipids from glycerol and 3 fatty acids</li> <li>• Use of glucose and nitrates to make proteins (PLANTS)</li> <li>• Respiration</li> <li>• Breakdown of protein to form urea.</li> </ul>



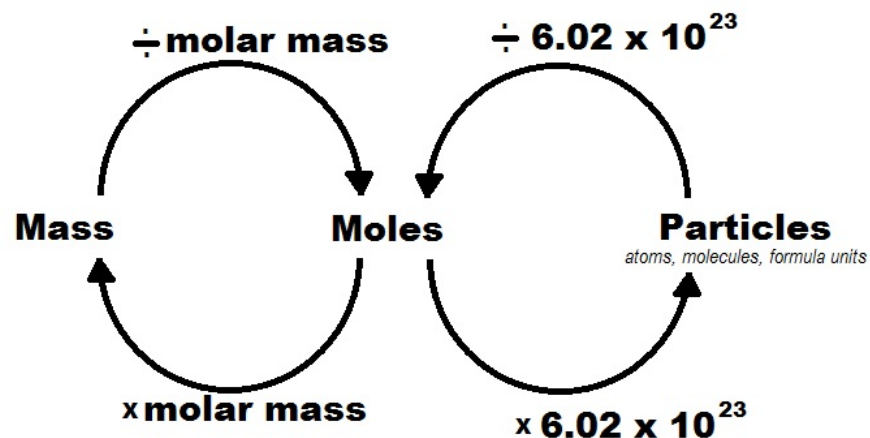
# Chemistry Topic 3: Quantitative chemistry

## 1. Keywords

Conservation of mass	No atoms are made or lost during a chemical reaction. The mass before the reaction must equal the mass after a reaction IN A CLOSED SYSTEM
Closed system	A container which no chemicals can escape. Eg a sealed bottle
Relative formula mass (Mr)	Sum of relative atomic masses from periodic table
Balanced equation	When the sum of the Mr on the left equals the sum of the Mr on the right
Uncertainty	The percentage of a result that might be wrong. Shown from differences between repeats
Limiting reactant	The reactant which runs out first

## 2. Moles (HT ONLY)

Mole	The number of particles needed to make the mass equal the atomic mass
Avogadro constant	$6.022 \times 10^{23}$ particles in 1 mole



## 3a. Concentration

$$C = \frac{\text{mass}}{V}$$

$C$	Concentration	$\text{g/dm}^3$
$\text{mass}$	mass	$\text{g}$
$V$	volume	$\text{dm}^3$ (litres)

## 3b. Concentration (HT ONLY)

$$C = \frac{m}{V}$$

$C$	Concentration	$\text{g/dm}^3$
$m$	mole	
$V$	volume	$\text{dm}^3$ (litres)

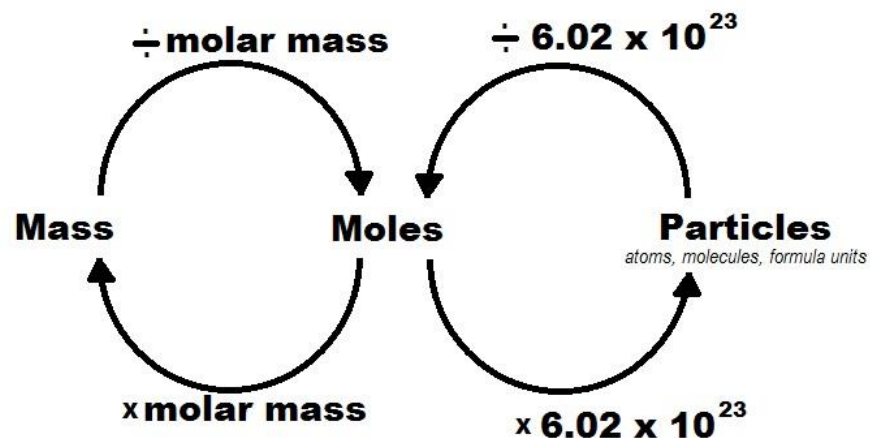
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## 3b. Concentration (HT ONLY)

$$C = \frac{m}{V}$$

$C$	Concentration	$\text{mol/dm}^3$
$m$	mole	
$V$	volume	$\text{dm}^3$ (litres)

#### 4. Percentage yield (TRIPLE ONLY)

$$\% \text{Yield} = \frac{\text{mass of actual}}{\text{Maximum mass}} \times 100$$

%Yield	Percentage yield	%
<i>mass of actual</i>	Mass of product actually obtained	g
Maximum mass	The theoretical maximum mass possible	g

#### 6. Volume of gases (TRIPLE HT ONLY)

1 mole of gas occupies 24 dm<sup>3</sup>

if 20°C and 1 atmosphere pressure

Equal moles occupy the same volume

#### 5. Atom economy (TRIPLE ONLY)

$$\% \text{ Atom economy} = \frac{\text{Mr of desired product}}{\text{Sum of Mr for all reactants}} \times 100$$

% Atom economy	Percentage atom economy	%
<i>Mr of desired product</i>	Relative formula mass of the product you want	g/mol
Sum of Mr for all reactants	The total of all the react Mr added together	g/mol

# Chemistry Topic 4: Chemical changes

1. Keywords	
Metal oxide	A compound formed when a metal ionically bonds to oxygen
Reactivity series	The order of elements in terms of their reactivity
Acid	A substance that releases H <sup>+</sup> ions and has a pH below 7
Base	A substance that neutralises an Acid and has a pH above 7
Alkali	A type of soluble base. A metal hydroxide. Releases OH <sup>-</sup> ions
Neutralisation	When an acid reacts with a base to produce a salt and water
Carbonates	Ionic compounds containing Carbon and oxygen
Salt	Ionic compound formed when acid and base react
Soluble	A substance that dissolves
Insoluble	A substance that does not dissolve
Indicator	A substance that changes colour when pH changes
Electrolysis	Splitting up an ionic substance using electricity
Molten	Turned to a liquid
Solution	Dissolved in water

2. REDOX			
Change	In terms of oxygen	In terms of hydrogen	In terms of electrons (HT ONLY)
Oxidation	Gaining oxygen	Losing hydrogen	Loss of electrons (OIL)
Reduction	Losing oxygen	Gaining hydrogen	Gain of electrons (RIG)

3. The reactivity series		
	Category	Extracted by
1	Highly reactive metals	Electrolysis
2	Base metals	Smelting: heating with carbon
3	Native metals	Found as nuggets of pure metal

Potassium  
Sodium  
Calcium  
Magnesium  
Aluminium  
*Carbon*

1

Zinc  
Iron  
Tin  
Lead  
*Hydrogen*  
Copper

2

Silver  
Gold  
Platinum

3

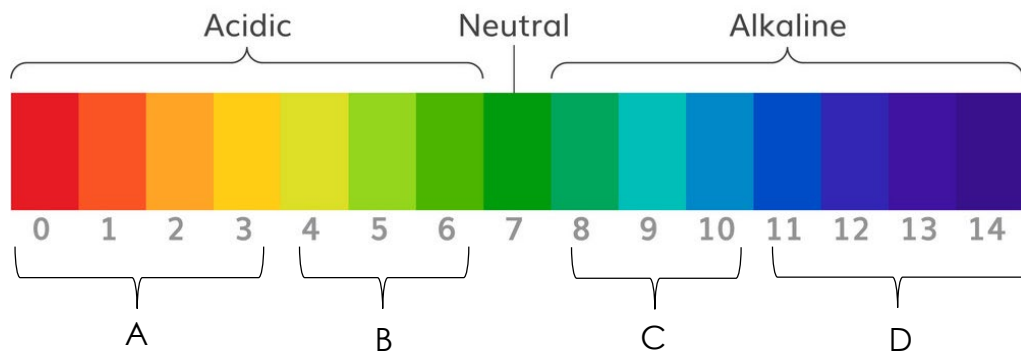
most reactive  
↑  
↓  
least reactive

NOTE: Hydrogen is not a metal and used to extract some other metals not on this list

#### 4. Naming salts

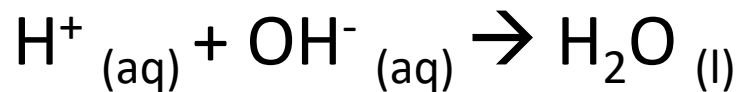
Acid used	Second part of salt's name
Hydrochloric acid	chloride
Sulfuric acid	sulfate
Nitric acid	nitrate

#### 5. pH scale



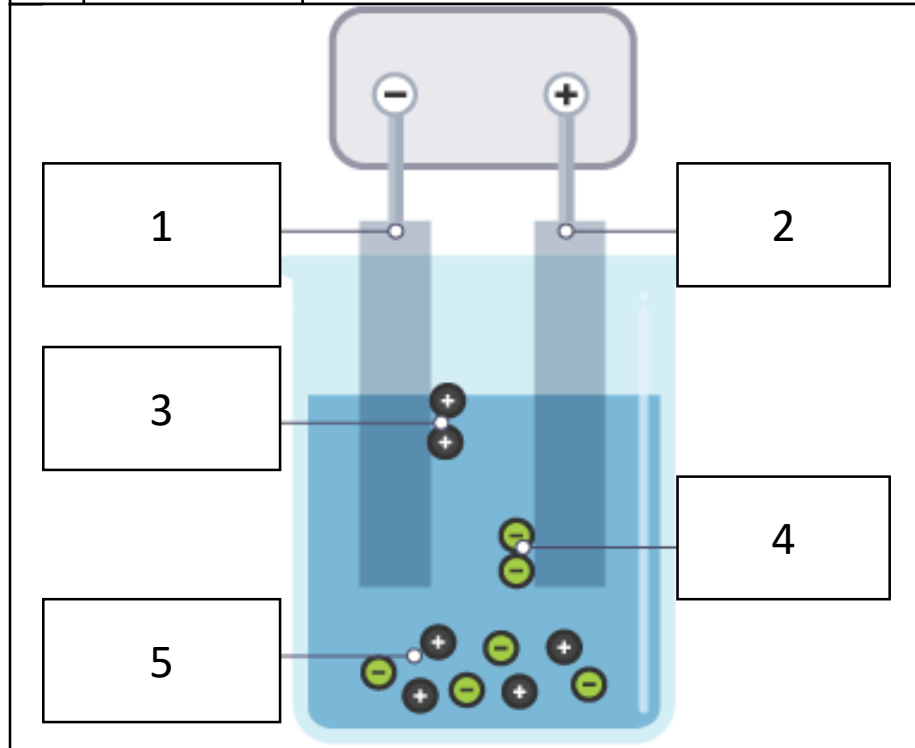
	Name	Level of ionisation in water
A	Strong acid	Fully
B	Weak acid	Partially
C	Weak base	Partially
D	Strong base	Fully

#### 6. Equation for all neutralisations



## 7. Electrolysis

1	Cathode	The negative electrode
2	Anode	The positive electrode
3	Positive ion	Move to cathode
4	Negative ion	Move to anode
5	Electrolyte	The ions that are being electrolysed



Don't **PANIC** - **P**ositive is **A**node, **N**egative is **C**athode.

## 8. Electrolysis of aqueous solutions

Place in reactivity series	Product of electrolysis
Metal more reactive than hydrogen	Hydrogen is produced at the cathode
If the negative ion is not a halide ion (group 7)	Oxygen is produced at the anode


# Physics Topic 3: Particle model

## 1. Density

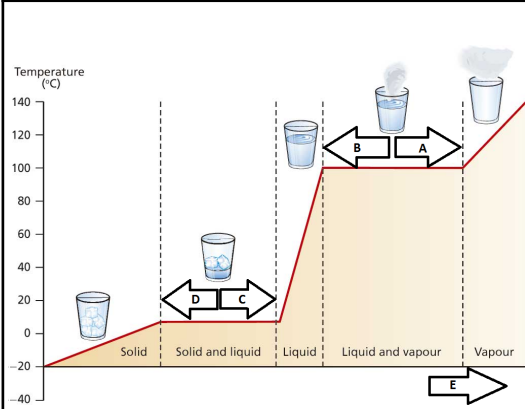
$$\rho = \frac{m}{V}$$

Symbol	Meaning	Unit
$\rho$	density	kg/m <sup>3</sup>
m	mass	kg
V	volume	m <sup>3</sup>

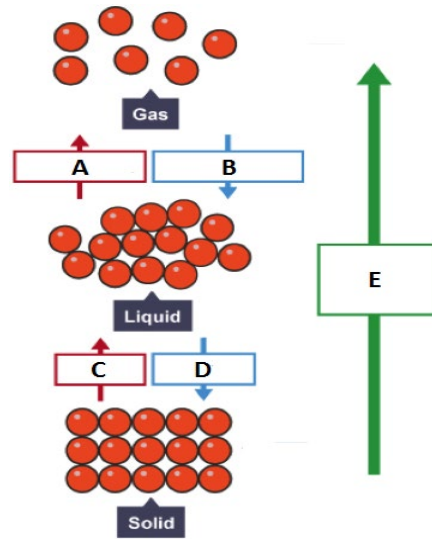
## 5. Gas properties

Diagram	
Arrangement of particles	Randomly arranged Far apart
Movement of particles	Brownian motion
Energy of particles	Very high energy
Density of substance	Very low density

## 2. Changes of state



- A. Evaporation/ Vaporisation
- B. Condensation
- C. Melting/ Fusion
- D. Freezing
- E. Increasing internal energy



## 3. The specific heat capacity

$$\text{Energy transferred, } \Delta E \text{ (joules, J)} = \text{mass, } m \text{ (kilograms, kg)} \times \text{Specific heat capacity, } c \text{ (joule per kilogram per degree Celsius, J/kg}^\circ\text{C)} \times \text{Temperature change, } \Delta\theta \text{ (degree Celsius, }^\circ\text{C)}$$

To find the specific heat capacity of a substance the equation can be rearranged to:  $c = \frac{\Delta E}{m\Delta\theta}$

## 4. The specific latent heat

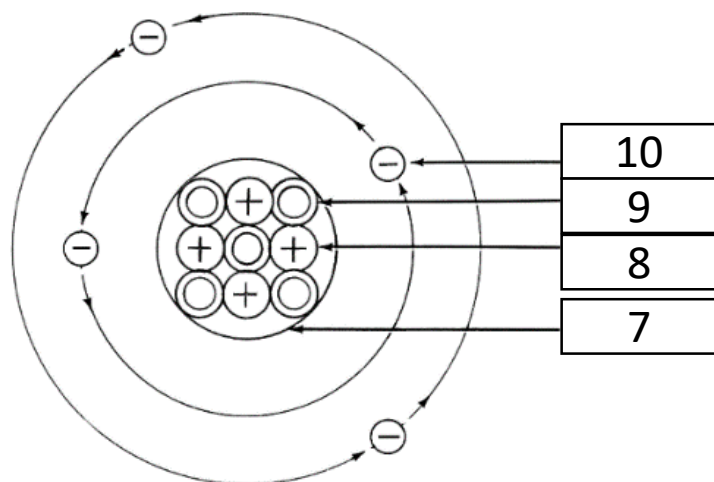
$$\text{Energy transferred, } \Delta E \text{ (joules, J)} = \text{mass, } m \text{ (kilograms, kg)} \times \text{Latent heat, } L \text{ (joule per kilogram J/kg)}$$

To find the specific latent heat of a substance the equation can be rearranged to:  $L = \frac{\Delta E}{m}$

# Physics topic 4: Atomic structure

## 1. Keywords

<b>1. Atom</b>	The smallest possible piece of an element. Has a radius of 0.1nm (or $1 \times 10^{-10} \text{m}$ ).
<b>2. Element</b>	A substance in which all the atoms have the same atomic number.
<b>3. Isotope</b>	Atoms with the same number of protons but different numbers of neutrons.
<b>4. Molecule</b>	Two or more atoms bonded together
<b>5. Compound</b>	Two or more <u>different</u> atoms bonded together
<b>6. Mixture</b>	At least two different elements or compounds together. Can be separated easily.
<b>7. Nucleus</b>	The centre of an atom. Contains protons and neutrons
<b>8. Proton</b>	A positively charged particle found in the nucleus
<b>9. Neutron</b>	A neutral particle found in the nucleus. Has no charge
<b>10. Electron</b>	A negatively charged particle found in energy levels (shells) around the nucleus



## 2. Properties of sub-atomic particles

Particle	Relative mass	Relative charge	Location
Proton	1	+1	Nucleus
Neutron	1	0	Nucleus
Electron	0	-1	Shells

### Key

relative atomic mass  
**atomic symbol**  
name  
 atomic (proton) number

1  
**H**  
 hydrogen  
 1

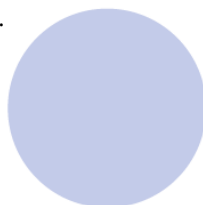
## 3. Using the periodic table

Number of..	Is the...	Found by..
Protons	Atomic (proton) number	Smaller number on periodic table
Electrons	Atomic (proton) number	Smaller number on periodic table
Neutrons	Difference between the atomic mass and atomic number	Big number – small number

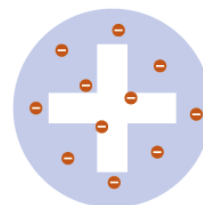
## 4. History of the atom

Discovery	By	Model	Diagram
Solid particle called atom	John Dalton	Particle: solid spheres	1
The electron	JJ Thompson	Plum pudding: positive 'cake' with negative 'plums'	2
Nucleus	Rutherford	Nuclear: Positive nucleus surrounded by electrons	3
Neutron	James Chadwick	Nuclear: Now with protons and neutrons in nucleus	3
Energy levels (shells)	Niels Bohr	Planetary: Electrons now 'orbit' in different shells	4

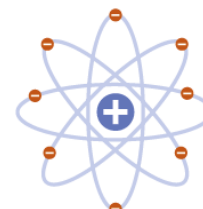
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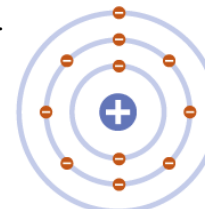
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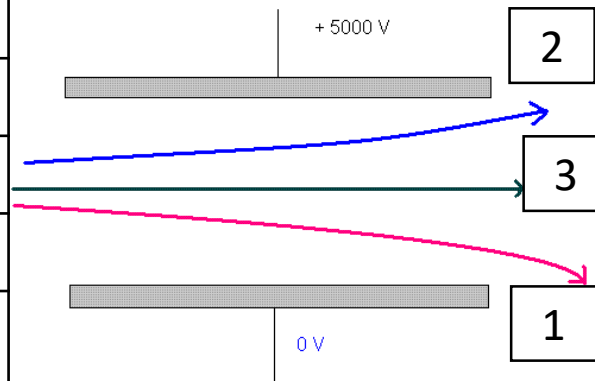
4.





## 5. Radioactive decay keywords

Unstable	The ability for a nucleus to decay
Radioactive decay	The RANDOM process of radiation being released by a nucleus. A different element is formed
Nuclear radiation	The energy and particles released when an unstable nucleus decays
Activity	How quickly a radioactive sample decays
Becquerel	The unit of activity
Geiger-Muller tube	A device to measure the count rate of a radioactive source
Count rate	The number of radioactive decays per second
Ionising power	How well it knocks off electrons and damages cells
Half life	The time it takes half of a group of radioactive nuclei to decay
Radioactive contamination	Unwanted hazardous materials containing radioactive atoms
Peer review	When the findings of one expert are double checked by another expert to make sure they are correct



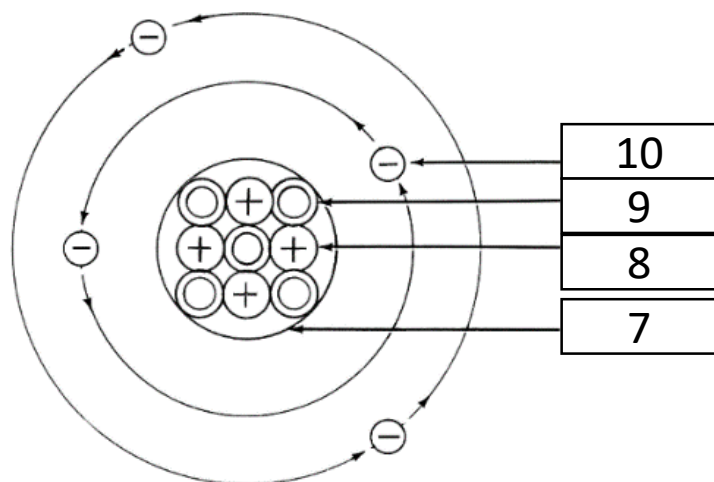
## 6. Ionising radiation

	Name	Symbol	Made of	Charge	Range in air	Penetration	Ionising power	
1	Alpha	$\alpha$	Helium nucleus	${}^4_2\text{He}$	<b>+2</b>	5 cm	Blocked by paper and skin	High
2	Beta	$\beta$	Fast moving electron	${}^0_{-1}\text{e}$	<b>-1</b>	15 cm	Blocked by thick aluminium	Medium
3	Gamma	$\gamma$	Electromagnetic wave	N/A	Very long	Blocked by thick lead	low	

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<b>6. Mixture</b>	At least two different elements or compounds together. Can be separated easily.
<b>7. Nucleus</b>	The centre of an atom. Contains protons and neutrons
<b>8. Proton</b>	A positively charged particle found in the nucleus
<b>9. Neutron</b>	A neutral particle found in the nucleus. Has no charge
<b>10. Electron</b>	A negatively charged particle found in energy levels (shells) around the nucleus



## 2. Properties of sub-atomic particles

Particle	Relative mass	Relative charge	Location
Proton	1	+1	Nucleus
Neutron	1	0	Nucleus
Electron	0	-1	Shells

### Key

relative atomic mass  
**atomic symbol**  
name  
 atomic (proton) number

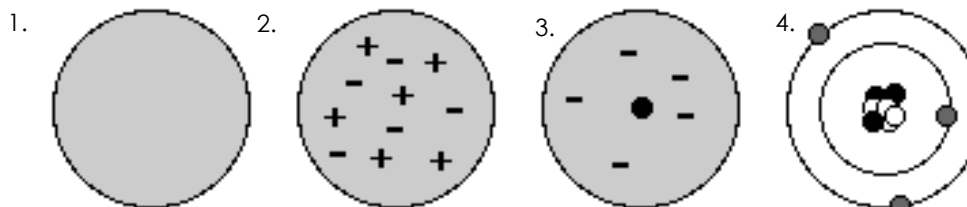
1  
**H**  
 hydrogen  
 1

## 3. Using the periodic table

Number of..	Is the...	Found by..
Protons	Atomic (proton) number	Smaller number on periodic table
Electrons	Atomic (proton) number	Smaller number on periodic table
Neutrons	Difference between the atomic mass and atomic number	Big number – small number

## 4. History of the atom

Discovery	By	Model	Diagram
Solid particle called atom	John Dalton	Particle: solid spheres	1
The electron	JJ Thompson	Plum pudding: positive 'cake' with negative 'plums'	2
Nucleus	Rutherford	Nuclear: Positive nucleus surrounded by electrons	3
Neutron	James Chadwick	Nuclear: Now with protons and neutrons in nucleus	3
Energy levels (shells)	Niels Bohr	Planetary: Electrons now 'orbit' in different shells	4



### 5. Radioactive decay keywords

Unstable	The ability for a nucleus to decay
Radioactive decay	The RANDOM process of radiation being released by a nucleus. A different element is formed
Nuclear radiation	The energy and particles released when an unstable nucleus decays
Activity	How quickly a radioactive sample decays
Becquerel	The unit of activity
Geiger-Muller tube	A device to measure the count rate of a radioactive source
Count rate	The number of radioactive decays per second
Ionising power	How well it knocks off electrons and damages cells
Half life	The time it takes half of a group of radioactive nuclei to decay
Radioactive contamination	Unwanted hazardous materials containing radioactive atoms
Peer review	When the findings of one expert are double checked by another expert to make sure they are correct

### 7. Background radiation (TRIPLE ONLY)

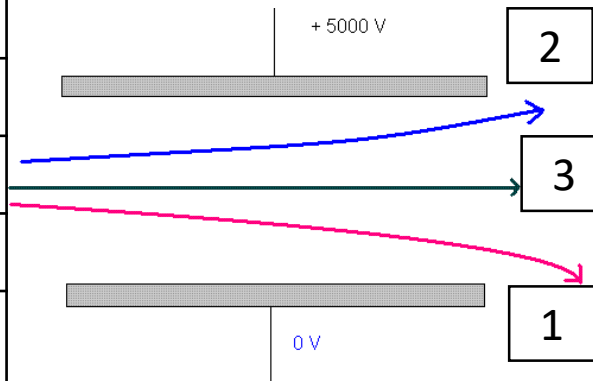
Background radiation is the radiation all around us all the time

Natural sources:

- Rocks
- Cosmic rays

Man-made sources:

- Fallout from weapons testing
- Fallout from nuclear incidents



### 6. Ionising radiation

	Name	Symbol	Made of	Charge	Range in air	Penetration	Ionising power	
1	Alpha	$\alpha$	Helium nucleus	${}^4_2\text{He}$	<b>+2</b>	5 cm	Blocked by paper and skin	High
2	Beta	$\beta$	Fast moving electron	${}^0_{-1}\text{e}$	<b>-1</b>	15 cm	Blocked by thick aluminium	Medium
3	Gamma	$\gamma$	Electromagnetic wave	N/A	Very long	Blocked by thick lead	low	

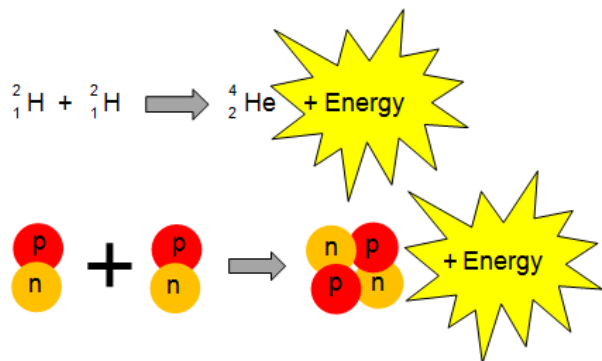
### 8. Uses of nuclear radiation (TRIPLE ONLY)

Use	Half life	Penetration power	Ionising power	Preferred emitter
Exploring internal organs	A few hours	Med-high	Low	Gamma
Radiotherapy	A few years	High	Med/Low	Gamma (or Beta)

### 9. Nuclear Fission vs Fusion (TRIPLE ONLY)

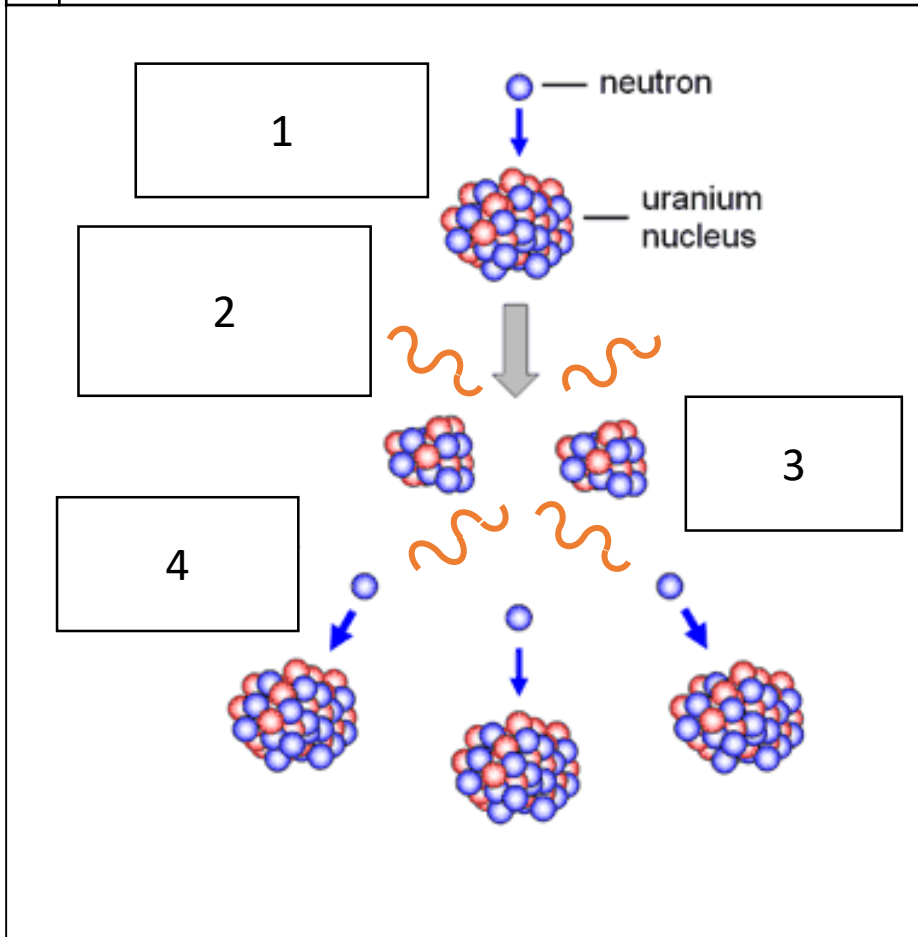
Nuclear fission	When a large nuclei breaks into smaller nuclei releasing energy	E.g: <ul style="list-style-type: none"> <li>Nuclear power stations</li> <li>Atomic bombs</li> <li>The core of the Earth</li> </ul>
Nuclear fusion	When small nuclei join together to form larger nuclei. Some mass is converted into energy	E.g: <ul style="list-style-type: none"> <li>The Sun</li> <li>Hydrogen bombs</li> </ul>

Figure 1





### 10. Nuclear fission (TRIPLE ONLY)

- 1 A slow neutron hits the nucleus
- 2 The nucleus becomes unstable and splits roughly in half
- 3 3 neutrons and gamma rays are released
- 4 These neutrons hit other nuclei causing a chain reaction
- 5 If this is uncontrolled then it will result in an explosion



# Confectionary:

 Confectionary is a term for sweets and  chocolate. It is typically anything that is sugary, such as candy, cakes and desserts.

**Sarah Graham**

Sarah Graham is a British painter who was born in 1977. She uses oil paints, working on a large scale. Her still life works depict sweets, candy wrappers and desserts. Her paintings are not only bright and colourful, but her hyper-realistic style gives the works a vivid, deep finish.

**Joel Penkman**

Joel Penkman is a New Zealand-British artist, born in 1979, who paints contemporary still-life. Her style is semi-photorealistic, which she uses to create interesting, playful depictions of confectionary, such as doughnuts and cakes. She uses the technique of egg tempera, which is where she mixes pigment (colour) with egg yolk.

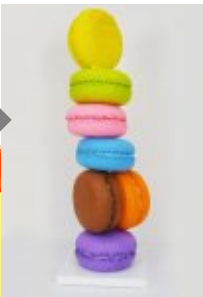
**Peter Anton**

Peter Anton is an American artist born in 1963. He is known for his oversized sculptures of candy. He describes himself as fascinated by the role food has in people's lives, now and throughout history. His work is quite humorous and surprising, as the sculptures are so realistic they are like an illusion.

## Keywords

**Investigate** – Exploring / looking into a topic.  
**Research** - Studying a topic carefully, such as finding out about an artist.  
**Annotate** - Adding notes to give an explanation or a comment.

**Analyse**- Examining in detail.  
**Develop** - Advancing a skill or knowledge in a subject.  
**Composition** - The way in which the elements of a piece of art are arranged.



# Year 10 ART Knowledge Organiser

## Lino Printing

Lino Printing is a form of block printing that involves carving a pattern or design into a linoleum, rubber or vinyl surface that can then be printed from.

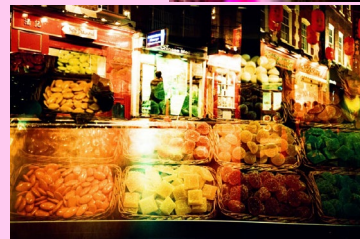
The traditional block printing surface is wood, however lino gained popularity in the early 20<sup>th</sup> Century due to it being a cheaper alternative.

It is achieved by carving out a design in the lino. The recesses created by the carving leave the design in relief, and it is the raised design that the ink is applied to. When the block is pressed onto paper, the ink is transferred from the lino to the paper, leaving the design behind.



## Photo Exposure

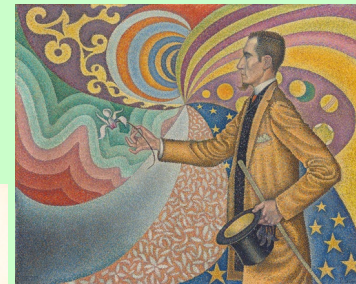
Double exposure photography is a technique that layers two different exposures on a single image, combining two photographs into one. Double exposure creates a surreal feeling for your photos and the two photographs can work together to convey deep meaning or symbolism. A similar technique, called a "multiple exposure," is when you combine more than two exposures in a single image.



## Pointillism

Pointillism is the practice of applying small strokes or dots of colour to a surface so that from a distance they visually blend together. The technique is associated with its inventor, Georges Seurat who founded Neo-Impressionism, a movement that flourished from the late 1880s to the first decade of the 20th century.

Pointillism can also be created using one colour, such as black. To create a successful piece of work using one colour and small dots, you must vary the pressure of the dots, and consider where you place each one. For example, lots of dots close together will appear darker than when spaced far apart.



## Silk painting

Silk painting is an ancient technique that first originated in India and Eastern Asia. Many Asian countries have their own unique silk painting techniques, including Japan, China, Vietnam, and Tibet, with practices that have been passed down and perfected throughout many generations of artists.

The 'Serti' technique is where designs are outlined with gutta or water-based resists, which are applied to white silk that has been pre-washed, dried and stretched (on a stretcher). Once the gutta or water-based resist has dried, it acts as a barrier for the dye or paint; keeping the colour within the outlined areas of the design and allowing you to achieve sharply defined borders.



## What are natural forms?

Natural forms are objects in nature in their original form.

### Examples:

- Leaves
- Flowers
- Pine cones
- Seaweed
- Shells
- Bones
- Insects
- Stones
- Fossils
- Crystals
- Feathers
- Birds
- Fish
- Animals

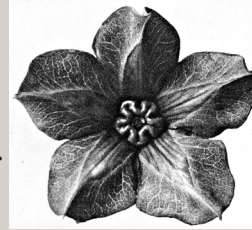
It is, in fact, anything you can find in nature – either complete or a part of it.



## Karl Blossfeldt (1865 - 1932)

Karl Blossfeldt was a German photographer best known for his striking close-up portraits of plants, twigs, seeds, leaves, and other flora. He was inspired by nature and the different ways that plants grow. He believed that "the plant must be valued as a totally artistic and architectural structure".

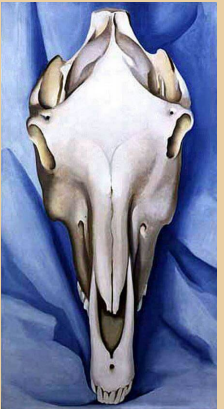
He was transfixed by the repetitive patterns created in the natural world, and in the early 1900's, he began documenting the structure and detail of plants, magnifying them up to 30 times their size using a home-made camera.



## Georgia O'Keeffe (1887 - 1986)

Georgia O'Keeffe was an American painter who was best known for her large-format paintings of natural forms, especially flowers and bones. She once said "I decided that if I could paint that flower in a huge scale, you could not ignore its beauty".

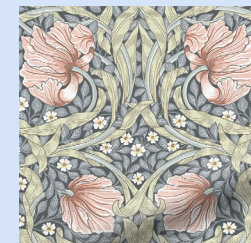
She painted nature in a way that showed how it made her feel. Her unique and new way of painting nature, simplifying its shapes and forms meant that she was considered a pioneer.



## William Morris (1834 - 1896)

William Morris was an English designer and craftsman, whose designs for furniture, fabrics, stained glass, wallpaper, and other decorative arts created the Arts and Crafts movement in England and revolutionized Victorian taste.

Morris took a new approach in the way he used natural forms in his designs. He understood plants intimately but never copied them literally. He said "It is impossible to imitate nature literally; the utmost realism of the most realistic painter falls a long way short of it". He believed that patterns should have 'beauty, imagination and order,' using these principles across all his work.



# Year 10 ART HT1 & HT2 Knowledge Organiser

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## Photo Exposure

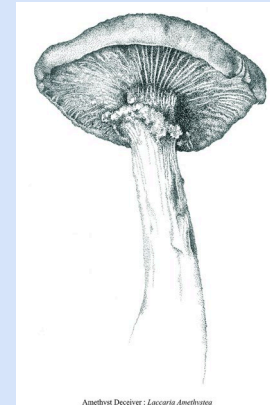
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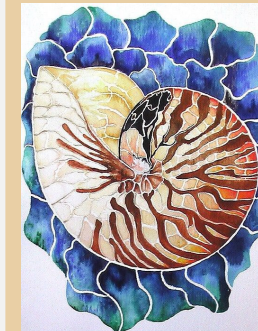


Anethysi Deceivri : Laccaria Anethysina

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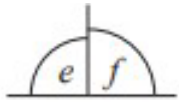




Angle Facts

Angles On a Straight Line

Always add up to  $180^\circ$

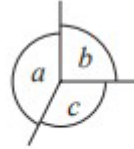


$$e + f = 180^\circ$$

Clip 45

Angles Around a Point

Always add up to  $360^\circ$

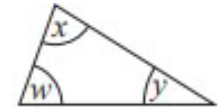


$$a + b + c = 360^\circ$$

Clip 45

Angles in a Triangle

Always add up to  $180^\circ$



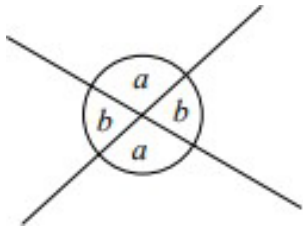
$$w + x + y = 180^\circ$$

Clip 45

Angle in Parallel Lines

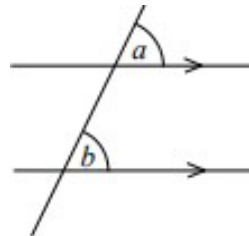
Vertically Opposite

Vertically opposite angles are equal.



Corresponding

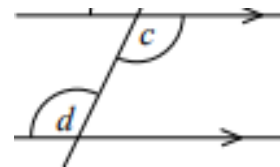
Corresponding angles are equal,  $a = b$ .



Clip 120

Alternate

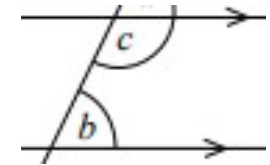
Alternate angles are equal,  $c = d$ .



Clip 120

Co-Interior

Co-interior angles add up to 180.



$$b + c = 180^\circ$$

Clip 120

Angles in Polygons

Interior and Exterior Angles

Interior angles are on the inside.

Exterior angles are on the outside.

Clip 123

The Sum of Interior and Exterior Angles

Interior and exterior angles always add up to  $180^\circ$

Example: The interior angle of a regular hexagon is  $120^\circ$ . Calculate the size of an exterior angle.

Solution:  
 $180 - 120 = 60^\circ$

Clip 123

The Sum of all Interior Angles

Sum of Interior angles =  
 (Number of sides - 2) x 180

Example: Calculate the sum of the interior angles of a heptagon.

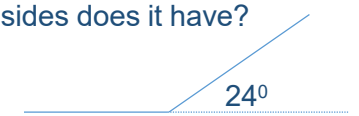
Solution:  
 Heptagon = 7 sides  
 $7 - 2 = 5$   
 $5 \times 180 = 900^\circ$

Clip 123

The Sum of all Exterior Angles

Sum of exterior angles =  $360^\circ$

Example: This is a corner of a regular polygon.  $24^\circ$  is the exterior angle. How many sides does it have?



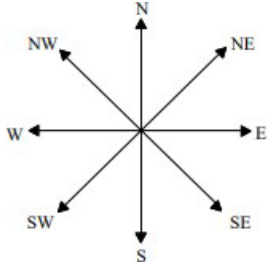
Solution:  $360 \div 24 = 15$  sides

Clip 123

### Bearings

#### Points of the Compass

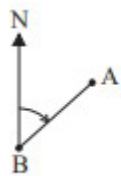
Bearings can be given as points of the compass



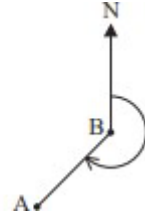
#### Bearings

Accurate bearing are measured clockwise from North, and written using three figures.

Bearing of A from B = 050°



Bearing of A from B = 210°



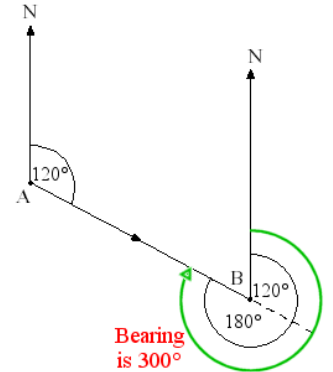
Clip 124

#### Return Bearings

In the picture on the right:

The bearing of B from A is 120°

The return bearing (of A from B) is 300°



### Simultaneous Equations

#### Simultaneous Equations

Finding solutions that work in two (or more) equations at the same time, like the ones below...

$$\begin{aligned} x + 2y &= 8 \\ 2x + y &= 7, \end{aligned}$$

...is called solving simultaneous equations.

#### Simultaneous Equations

First label the equations

$$\begin{aligned} x + 2y &= 8 & (1) \\ 2x + y &= 7 & (2) \end{aligned}$$

Then multiply to match the coefficients (the number before the letter)

$$\begin{aligned} 2x + 4y &= 16 & (3) & [2 \times (1)] \\ 2x + y &= 7 & (2) \end{aligned}$$

#### Simultaneous Equations

Next add (or subtract) to remove an unknown

$$\begin{aligned} 2x + 4y &= 16 & (3) \\ 2x + y &= 7 & (2) \\ \hline 3y &= 9 & (3) - (2) \end{aligned}$$

Here, we can see that  $y=3$

#### Simultaneous Equations

Finally, substitute into a previous equation to calculate the other unknown. Here we used equation (1)

$$\begin{aligned} x + 2 \times 3 &= 8 \\ x + 6 &= 8 \end{aligned}$$

We can see here that  $x=2$  [Clip 162](#)

### Indices and Standard Form

#### Laws of Indices

[Clips 82, 154, and 188](#)

$$a^m \times a^n = a^{m+n} \quad 2^7 \times 2^3 = 2^{10}$$

$$a^m \div a^n = a^{m-n} \quad 2^7 \div 2^3 = 2^4$$

$$(a^m)^n = a^{m \times n} \quad (2^7)^3 = 2^{21}$$

#### Negative Indices

$$a^{-n} = \frac{1}{a^n}$$

For example...

$$\begin{aligned} 3^{-2} &= \frac{1}{3^2} \\ &= \frac{1}{9} \end{aligned}$$

Standard Form is used to write large and small numbers concisely.

In *standard form*, numbers are written as

$$a \times 10^n$$

where  $1 \leq a < 10$  and  $n$  is an integer.

[Clip 83](#)

#### Large Numbers

Large Numbers are written like this...

$$473\,000 = 4.73 \times 100\,000$$

$$= 4.73 \times 10^5$$

#### Small Numbers are written...

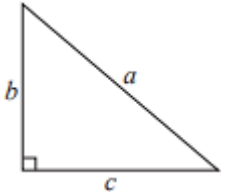
$$0.000621 = \frac{6.21}{10000}$$

$$= \frac{6.21}{10^4}$$

$$= 6.21 \times 10^{-4}$$

Pythagoras

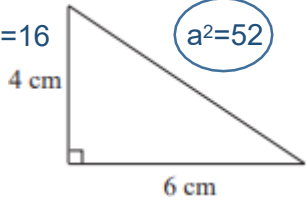
Pythagoras Theorem can be used to find missing sides of right-angled triangles



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

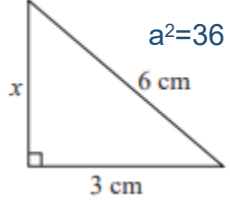
Clip 150

Pythagoras – finding the hypotenuse...



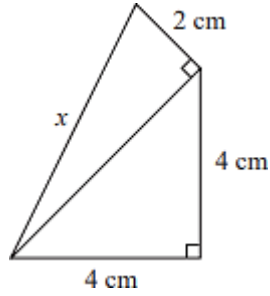
$b^2 = 16$        $a^2 = 52$        $a = \sqrt{52}$   
 $c^2 = 36$        $= 7.2 \text{ cm}$

Pythagoras – finding the shorter side...



$b^2 = 27$        $a^2 = 36$        $\sqrt{27} = x$   
 $c^2 = 9$        $x = 5.2 \text{ cm}$

Pythagoras  
Try this double-Pythagoras question.

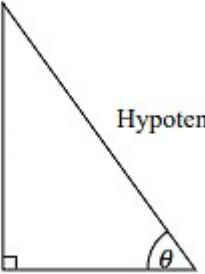


Solution:  $x = 6 \text{ cm}$

Trigonometry

Trigonometry is used when angles need to be considered.

Clip 168

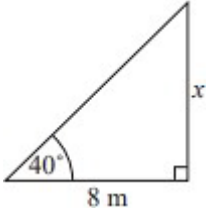


$$\sin \theta = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\cos \theta = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\tan \theta = \frac{\text{opposite}}{\text{adjacent}}$$

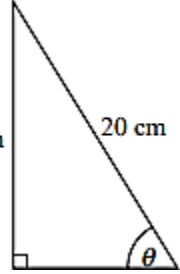
Trigonometry – Finding a missing side...



opposite =  $x$   
 adjacent = 8 metres

$\tan \theta = \frac{\text{opposite}}{\text{adjacent}}$   
 $\tan 40^\circ = \frac{x}{8}$   
 $8 \tan 40^\circ = x$   
 $x = 8 \tan 40^\circ$   
 $= 6.7 \text{ metres}$

Trigonometry – Finding a missing angle...



In this triangle,    hypotenuse = 20 cm  
                               opposite = 14 cm

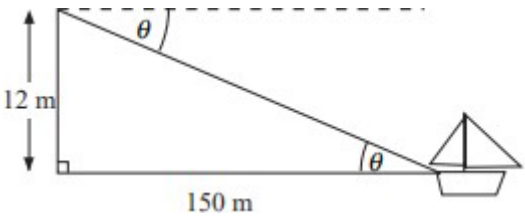
$\sin \theta = \frac{\text{opposite}}{\text{hypotenuse}}$   
 $\sin \theta = \frac{14}{20}$   
 $= 0.7$

Using 'shift' and 'sin' for 'sin<sup>-1</sup>' gives...  
 $\theta = 44.4^\circ$  (to 1 d.p.)

Trigonometry – Problem Solving  
Try the following question:

A man looks out to sea from a cliff top at a height of 12 metres. He sees a boat that is 150 metres from the cliff. What is the angle of depression?

The problem can be represented as this diagram...



Solution:  $4.6^\circ$

# Year 10 BTEC Dance Subject Term Knowledge Organiser

## Component 1- Exploring the Performing Arts Jazz Dance

Students will gain a **practical appreciation** of practitioners' work in using existing performance material in dance. They will learn how they may respond to or treat a particular theme or issue. How they also use/interpret/modify a pre-existing style and how they communicate ideas to their audience through stylistic qualities.

### Bob Fosse- choreographer

Characteristic of his style is a type of trio dance, with its forward thrust of hips, hunched shoulders, turned-in feet and sharp, jazzy movements enhanced by sound effects. Derbies and animated hands became trademarks of his work

- Fosses show-stopping ability came from the knowledge of how to build a number to a climax, to give it a beginning, middle and end – and his ability to do it with sex and humour.
- Fosse dancers must be able to isolate everything, right down to their eyeballs, elbows and fingers. When a Fosse dancer learns to focus her energy in stillness, she can grab the audience with a simple flutter of her fingers. "It should look like you're not working at all—but you'll come off stage sweating."

### Overview of key features:

- Sound effects (clapping hands, stamping feet, fsss sounds)
- Percussive rhythms
- Derbies and white gloves
- Angular posturing
- Shoulder rolling
- Finger stretching
- Dynamic use of lightening effects
- Percussive sounds which are a key feature of Jazz genre.
- Undercurrent of sensuality



**CHICAGO** focuses on the theme of celebrity and what people will do to achieve it. Neither Roxie nor Velma murder purely for publicity, but once they have they are eager to exploit their newly found fame to the full.

### Historical context

The piece was set in 1924 and Chicago was based on real stories. In particular, the 1926 play by Maurine Dallas about the murders and trials of Belva Gaertner and Beulah Annen. This meant Chicago's press and public became riveted by the subject of homicides committed by women. The time of Vaudeville was a very popular art form in the 1920's consisting of a diverse series of short acts. In the 2000 film version before Velma goes on stage you can hear the director say "on in five" meaning that this was part of a Vaudeville variety show.

### ROXIE HART- main character

As pretty as she is self centred, Roxie Hart's unrelenting search of fame and glory forms the spine of "Chicago". Not very bright and never thinking about the consequences of her actions, Roxie makes bad decisions throughout the show – all in the name of public recognition. Her wannabe vaudeville mind set lasts throughout the entire show.

### Velma Kelly-main character

Tough, sexy, and sarcastic, Velma Kelly is a vaudeville performer who resides in Cook County Jail after she murdered her cheating husband and sister. Used to being the "main attraction", Velma fiercely competes with up and coming rival superstar Roxie for the attention of the press and to preserve her celebrity status. In Brechtian style, Velma often breaks the fourth wall and addresses the audience directly to explain certain events within the show and express herself in the style of Fosse.



# Year 10 Subject Term Knowledge Organiser: Business Studies

## Unit 2.5 Making human resource decisions: Motivation

= means connective

### What is a Motivation?

Motivation is the way in which workers can be encouraged to work and do their best.

### Benefits of Motivation

- o Higher Quality goods
- o Better Customer Service
- o Less Mistakes
- o Less Likely to leave (*Higher staff retention*)
- o More productive (*make more*)

### Discuss the benefits of a well motivated workforce (6)

Workers produce **higher quality products**/offer higher quality service = happy customers = high levels of customer satisfaction = more sales and therefore profit = more money to spend improving the business.

Employees are less likely to leave so there is **higher staff retention** = money doesn't have to be spent on recruitment and training costs = costs are lower = more profit = more money to spend making the business better.

### Financial Motivators:

These involve giving the workers more money

### Non Financial Motivators:

Involves giving rewards that do not involve money

### Remuneration:

The payment system adopted by a business to pay and reward employees

### Financial Motivators:

#### Overtime:

The time rate maybe increased to persuade the worker to work extra hours above the normal working day or week. It maybe paid at time and quarter or time and a half.

+ Encourages workers to stay so customers not let down = high levels of customer satisfaction = customer loyalty = more sales and profit

### Financial Motivators

#### Salary

The firm agrees to pay the worker an amount of money for the year. This is divided by 12 and paid out monthly.

+ *Helps firms cashflow as they know how much is being spent on wages*

- *Employees can get demotivated if they are working long hours and not getting paid for it.*

#### Piece Rate:

The worker is paid a sum of money for each item they make.

+ *Encourages high levels of productivity meaning costs are lower*

- *Quality of products can suffer if the employee is rushing*

#### Bonus:

This is an extra lump sum of money that may be paid to employees they reach a target level of production.

+ *Encourages employees to work as hard as they can to get the bonus*

- *Can be demotivating to those that don't get the bonus*

#### Commission:

This is paid to workers who sell goods or services. The employees gets a percentage of the value of the goods or services they sell.

+ *Encourages employees to work as hard as they can to get a higher commission*

- *Can be demotivating if they employee is working hard but just not making the sales*

#### Time Rate:

The worker is paid a set sum of money for each hour worked

+ *Only pay workers when there is enough work for them to do = more cost effective = saves money = more profit = more money to spend making the business better*

- *Employers can not expect employees to stay over their working hours to meet customer demand = employees may not want to = unsatisfied customers = bad reputation = loss of sales and profit*

#### Overtime

- *Expensive = costs higher = profit lower = less money to spend*

# Year 11 Subject Term Knowledge Organiser: Business Studies

## Fringe Benefits – A Financial Motivator

An extra benefit on top of an employee's money wage or salary, for example a company car, private health care, free gym membership

- + Help motivate employees = less likely to leave
- Expensive = waste of money if it doesn't actually motivate people to work harder

## Non Financial motivators

### Job Rotation

Motivation is the way in which workers can be encouraged to work and do their best.

- + Stops employees getting bored
- + Can cover for absent colleagues
- Doesn't allow the employee to become an expert in any role

### Job Enrichment

Giving employees additional responsibilities and tasks normally given to higher level employees.

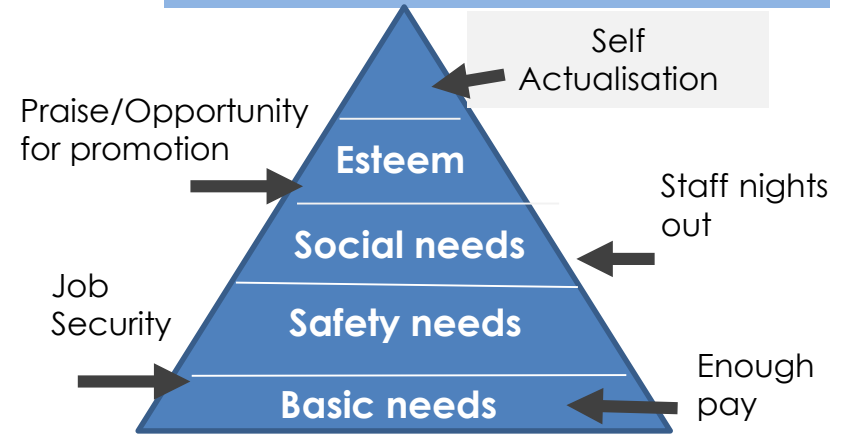
- + Makes employees feel valued
- + Can highlight potential employees for promotion
- May be Training costs involved
- Employee mightn't want the responsibility (demotivating)

### Autonomy

Management allow employees a great deal of freedom to make choices and decision in the workplace.

- + Employees feel trusted
- + Can highlight potential employees for promotion
- Mistakes may be made as the employee mightn't have the correct skills
- Employee may not want the extra responsibility (demotivating).

## Relating questions to the Employees



## Explain the benefit of an increase in pay to a Sainsbury's checkout worker (3)

Increased pay may improve the employees motivation because working in a supermarket is relatively low paid. The increase in pay may allow workers to buy extra necessities which may be more important to them that anything else like extra responsibility as they may not have their basic needs met

## Describe 1 way Goldsmith & Jones could motivate Sally who is an accountant. (3)

Sally is a highly skilled worker and therefore is likely to be paid a reasonable salary. As a result Sally is more likely to be motivated by the chance of promotion as she is likely to have enough money to meet her basic needs according to Maslow and be motivated by higher level needs up the hierarchy

# Year 10 HT3 Knowledge Organiser for BTEC Sport— Component 1



## Exercise Intensity

**Aerobic endurance** = It is the ability of the cardio-respiratory system to efficiently supply nutrients and oxygen to working muscles during sustained physical activity.

**Muscular strength** = The maximum force a muscle or muscle group can produce. (Measured in N or KG)

**Muscular endurance** = It is the ability of a muscle or group of muscles to keep contracting over a period of time against light to moderate load.

**Flexibility** = Having an adequate range of motion in all joints of the body. It is the ability to move a joint through its complete range of movement.

**Speed** = The ability to perform a movement or cover a distance in a short period of time = distance/time taken.

**Body composition** = This is the relative ratio of fat mass to fat free mass (vital organs, muscle, bone) in the body



## Components of Fitness — Skill

**Balance** = The ability to maintain your centre of mass over a base of support. A performer may need static or dynamic balance.

**Agility** = The ability of a sports performer to quickly and precisely move or change direction without losing their balance.

**Coordination** = The smooth flow of movement needed to perform a task efficiently and accurately. It often involves being able to use 2 or more body parts together.

**Reaction Time** = The time taken for a sports performer to respond to a stimuli and the start their response.

**Power** = The work done in a unit of time. It is the ability to apply a combination of strength and speed.  $\text{Power} = \text{Force (kg)} \times \text{Distance (m)/time (min or s)}$

## Keywords

**Cardio-Respiratory** = The heart and blood vessels working with the lung and the airways to carry oxygen to the muscle.

**Contracting** = This is when the muscles shortens to create a movement Accelerative

**Speed** = Gradually increasing your speed Pure Speed = Your maximum speed.

**Endurance** = The ability to prolong the amount of time near maximum speed Static

**Balance** = Balancing without moving Dynamic Balance = Balancing when moving

**Stimuli** = Something which causes a response or movement



# Year 10 HT3 Knowledge Organiser for BTEC Sport—

## Unit 1 Fitness for Sport and exercise

### Exercise Intensity

#### Measuring Heart Rate

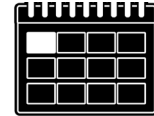
1. Sit Down
2. Locate your radial with your index and middle finger
3. Don't use your thumb—it has its own pulse
4. Count the beats from 30 seconds and times it by 2 to find your BPM



### Basic Principles of Training

We apply principles of training to our training programmes so that we make it effective and make sure it aids progression.

#### The Basic Principles of Training



### Training Zones

Speed Zone = 95% to 100% of MHR

Anaerobic Training Zone = 85% to 95% of MHR

Aerobic Training Zone = 60% to 85% of MHR



### The Borg Scale - Rate of Perceived Exertion (RPE)

The Borg scale is used to predict or estimate the Heart Rate of an individual.

Practice by the individual is needed to make their predictions as accurate as possible

The individual rates themselves from 7 to 20 on the scale.

They then times this by 10 to get an estimated HR

$RPE \times 10 = HR$  (BPM)

**Frequency** = How often we train Increasing the number of days

**Intensity** = How hard we train Increasing the number or reps

**Time** = How long we train Increasing the time we train

**Type** = How we train selecting the correct training method

The FITT principle is part of the Additional Principle of **PROGRESSIVE OVERLOAD.**

This is the gradual increase of a training load, when done correctly it will progressively increase Frequency, Intensity, Time and Type to develop fitness gains

### Key terms



**Heart Rate (HR)** = The amount your heart beats in 1 minute (BPM)

**Maximum Heart Rate (MHR)** = The maximum your heart will beat in 1 minute,  $220 - \text{Age} = \text{MHR}$

**RPE** = Rate of Perceived Exertion (How hard we think we have worked)





# Year 10 HT3 Drama Knowledge Organiser

## Summary of topic

They must understand the GCSE requirements of the devising plays unit and understand what constitutes successful devised work



## Skills & Definitions

**Ensemble** – Collaborated group performance.

**Characterisation** – The creating, development and performance of a created character.

**Improvisation** – Spontaneous acting and suggestions that further develop a performance.

**Devised** – Original created performance material, often using a stimulus.

**Stimuli** – The starting point set by exam board e.g. picture, quote, word or song. You chose one.

**Practitioner** – Brecht or Artaud and how they influenced the performance.

**Brecht** – Famous for Political and Epic Theatre. (See practitioner knowledge organiser). Made the audience think and bring real change.

**Artaud** – Famous for Theatre of Cruelty (See practitioner knowledge organiser). Made the audience feel uncomfortable.

**Genre** – Physical theatre is NOT a practitioner, it is a STYLE of drama focused upon storytelling using movement.

**Techniques** – The key skills which are relevant to the practitioner or genre (see practitioner knowledge organiser).

**Final performance** – The end performance of the piece.

**Rehearsal** – The process of creating and developing your piece of theatre

**Monologue** – A one person speech in character. Often around 2 minutes in length.

## Aims of the topic

To use given stimuli to create and develop a devised piece of theatre

*'Life itself is the most wonderful fairy-tale'* – Hans Christian Anderson

## **Devising Plays Knowledge Organiser**

### **Y10 GCSE**

### Assessment & Rehearsal Tips

- You will be offered 4 pieces of stimuli given to us by the exam board. 1 song, 1 quote, 1 phrase and 1 picture.
- In your given groups, you will generate ideas for each stimuli
- You will then decide on a stimuli and an idea. Then you will decide on a practitioner to use for your idea
- In your groups you will create a piece of drama around your idea, linked to the stimuli and using practitioner techniques
- Try everything – even if something doesn't work, you may discover something useful.

*What's the point of having a voice if you're gonna be silent in those moments you shouldn't be?*  
– The Hate U Give by Angie Thomas



*'Superheroes'* – The Script

### Devising Rules

- Every actor should have a monologue that is at least 90 seconds long and everyone should have an equal part.
- Divide the work up evenly – script writing (everyone write/plan their own scene), sourcing costume, planning technical theatre (staging, music, lights)
- Help each other out – but only when your own work is done. Even though this is a group project, you still get marked individually.
- Find an idea that every person is happy with and don't rule anything out.
- Try to get it on its feet early – the best ideas come from when you try to act something out, not sit there discussing it.

## Macbeth, Shakespeare, Knowledge Organiser

### Plot Overview:

Three witches tell the Scottish general Macbeth that he will be King of Scotland. Encouraged by his wife, Macbeth kills the king, becomes the new king, and kills more people out of paranoia. Civil war erupts to overthrow Macbeth, resulting in more death.

**Summary:** After we read each act add a sentence to summarise the events.

Act 1:  
Act 2:  
Act 3:  
Act 4:  
Act 5:

### Context:

<p><b>William Shakespeare</b>  <b>Full name:</b> William Shakespeare.  <b>Born:</b> Exact date unknown, but baptised 26 April 1564.  <b>Hometown:</b> Stratford-upon-Avon, England.  <b>Occupation:</b> Playwright, actor and poet.  <b>Died:</b> 23 April 1616.  <b>Best known for:</b> Writing hugely successful theatre plays!  <b>Also known as:</b> The Bard of Avon.  <i>During his lifetime, <b>William Shakespeare</b> wrote around <b>37 plays</b> for the theatre and <b>over 150 poems!</b></i></p>	<p><b>Witchcraft</b>                  Until the 1700's most people in England believed in witches and witchcraft. This way of life was related to Pagan (non-Christian) beliefs, and had been tolerated for many years. But from the mid 1500's religious leaders tried to stamp out these beliefs to make sure that people were following the right religious practices. King James I wrote a book called <b>Daemonologie</b> in which he supported and encouraged the trials of witches. He believed the witches were being controlled by the devil.</p>	<p><b>Gender Expectations and Norms</b>                  Both 14<sup>th</sup> century Verona and Elizabethan England were patriarchal societies. Women were denied all political rights and considered legally subject to their husbands. Disobedience was seen as a crime against their religion. Women who did not marry for whatever reason were forced to live in under the control of a male relative in his home or in a convent, where a woman could become a nun. Aristocratic families often required their young daughters to marry successful older men. Girls were considered eligible at the age of 14 and had to give their consent to marriage.</p>	<p><b>The Great Chain of Being</b>                  Belief of a clear hierarchal order, where the closest (authority was derived from God) person to God was the King. God was at the top then came angels, mankind, animals, birds etc. In the human order the King was supreme – questioning the will of the king had religious as well as political significance. By killing the King Macbeth has caused chaos as well as going against the divine right as God chooses the King.</p>
<p><b>King James I</b>                  When Elizabeth I died without any children in 1603, her cousin King James VI of Scotland became king of England. He was given the title King James I. It was the first time that England, Scotland and Ireland were ruled under a single monarch. James I was highly intelligent and developed a love of learning. His succession known as the Union of Crowns was unpopular for many Scots, who considered it disastrous/English did not like it either being ruled by the Scottish. James I became the patron of the King's Men – the playing company that Shakespeare belonged to for most of his career.</p>	<p><b>The Gunpowder Plot</b>                  The gunpowder plot was an attempt by seven Catholic conspirators to blow up the new King and his parliament in 1605. The most famous of these plotters was Guy Fawkes, although he was not the leader of the group. They hid kegs full of gunpowder in the cellars beneath the chamber where the king and the rest of the political elite would assemble. Enough powder was stored to completely destroy the building and kill everyone present. But Guy Fawkes was caught with the gunpowder in the cellars, just twelve hours before the state opening of parliament. King James I's life was saved. The plotters were tortured and executed being hung, drawn and quartered.</p>	<p><b>Staging and Theatre</b>                  The play was first performed in 1595. 16<sup>th</sup> and 17<sup>th</sup> Century audiences watched Shakespeare's plays being performed at open-air London theatres during the day. The stage had no scenery and no props and women were played by boys with unbroken voices. The poorer 'groundings' stood nearest to the stage and wealthier spectators paid higher prices to watch from seated galleries.</p>	<p><b>Religion</b>                  Christian beliefs. Prominent in society – belief in God and hell. Therefore, conscious on what will happen after death depending on sins committed whilst alive.</p>

Assessment Overview: Part A and Part B.		Techniques: Language, structure and form.		
Part A	Part B	Language	Structure	Form
<p>You are given an extract from the play.</p> <p>You need to analyse how Shakespeare presents a character or relationship.</p> <p><b>Criteria:</b>  <b>3 paragraphs</b>  <b>Clear point</b>  <b>Embed evidence</b>  <b>Include language, structure and form</b>  <b>Explain what the quote shows</b>  <b>Analyse the techniques</b>  <b>Refer to the audience</b></p>	<p>After the extract, you are given a theme shown in the play.</p> <p>You need to refer to events elsewhere in the play which relate to that theme.</p> <p><b>Criteria:</b>  <b>3-4 paragraphs</b>  <b>Clear point</b>  <b>Event description</b>  <b>Explain what the event shows</b>  <b>Explain how it shows the theme</b>  <b>Explain why it is significant</b>  <b>Refer to context</b>  <b>Refer to the audience</b></p>	<p><b>Imagery:</b> Language which creates vivid sensory ideas in</p> <p><b>Simile:</b> An explicit comparison between two things using 'like' or 'as'</p> <p><b>Metaphor:</b> An implicit comparison between two things not using 'like' or 'as'.</p> <p><b>Personification:</b> Attributing human like qualities to objects, ideas or animals.</p> <p><b>Alliteration:</b> the occurrence of the same letter or sound.</p> <p><b>Triple emphasis:</b> Description using 3.</p> <p><b>Oxymoron:</b> The combination of words or ideas which have opposite or very different meanings.</p> <p><b>Assonance:</b> Resemblance of sound between syllables of nearby words, arising particularly from the rhyming of two or more stressed vowels.</p> <p><b>Sibilance:</b> The sibilant or hissing sounds are created. These soft consonants are s with sh, and ch, th including three others such as z, x, f and softer c.</p> <p><b>Motif:</b> A repeated idea or image used throughout a text.</p>	<p><b>A single plot:</b> No sub plot in Macbeth – focuses solely on his rise and fall – befits the intensity of the evil in the play – rise and fall of Macbeth which are prefaced by the Witches' contributions.</p> <p><b>A Two fold structure:</b> Act 1 and 2 Macbeth is in a position of power. Turning point is Act 3 at the banquet scene. Following this his power declines.</p> <p><b>Foreshadowing:</b> Witches' foretelling of Macbeth – the prophecies.</p> <p><b>Dramatic Irony:</b> Some things are revealed to the audience before the characters increasing tension.</p> <p><b>Juxtaposition:</b> The placement of two ideas, statements or events near each other to invite comparison to contrast.</p> <p><b>Rhyming:</b> (of a word, syllable, or line) have or end with a sound that corresponds to another.</p> <p><b>Rhythm:</b> a strong, regular repeated pattern of movement or sound</p> <p><b>Line length:</b> The length of the line.</p> <p><b>Repetition:</b> the action of repeating something that has already been said or written.</p>	<p><b>Blank Verse:</b> Verse without rhyme, especially that which uses iambic pentameters – higher rank characters.</p> <p><b>Prose:</b> Language that is without a specific pattern – usually lower standing characters speak in this.</p> <p><b>Iambic Pentameter:</b> A line of verse with five metrical feet, each consisting of one short (or unstressed) syllable followed by one long (or stressed) syllable.</p> <p><b>Sonnet:</b> a poem of fourteen lines using any of a number of formal rhyme schemes, in English typically having ten syllables per line.</p> <p><b>Soliloquy:</b> An act of speaking one's thoughts aloud when by oneself or regardless of any hearers, especially by a character in a play.</p> <p><b>Aside:</b> A remark or passage in a play that is intended to be heard by the audience but is supposed to be unheard by the other characters in the play</p> <p><b>Monologue:</b> a long speech by one actor in a play.</p>

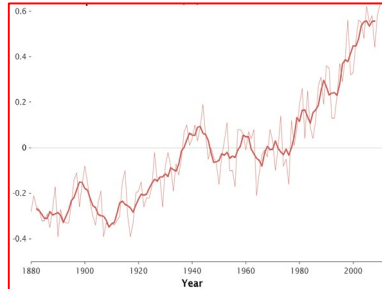
# What is Climate Change?

Climate change is a large-scale, long-term shift in the planet's weather patterns or average temperatures. Earth has had tropical climates and ice ages many times in its 4.5 billion years.

## Quaternary geological period

The quaternary period is the last 2.6 million years. During this period temperatures have always fluctuated. The cold 'spikes' are the glacial periods, whereas the warm points are the interglacial periods.

Today's temperature is higher than the rest of the period. Despite alternate cold and warm moments within this period, global temperatures have increased above average in the past 100 years. This current trend is what's become known as global warming.

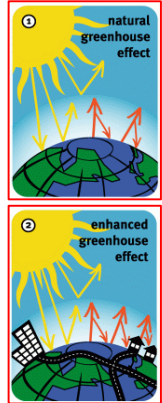


# Natural Greenhouse Effect

The Earth is kept warm by a natural process called the Greenhouse Effect. As solar radiation hits the Earth, some is reflected back into space. However, greenhouse gases help trap the sun's radiation. Without this process, the Earth would be too cold to support life as temperature would average as -18°C instead of +15°C.

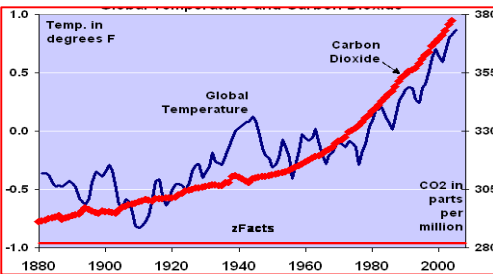
## Enhanced Greenhouse Effect

Recently, there has been an increase in humans burning fossil fuels for energy. These fuels (gas, coal and oil) emit extra greenhouse gases. This is making the Earth's atmosphere thicker, therefore trapping more solar radiation but causing less to be reflected. As a result, our Earth is becoming warmer.



# Linking CO<sub>2</sub> and Global temperatures

The rate of carbon dioxide and increase in global temperatures is strong. Scientist agree that this increase is caused by human activity.



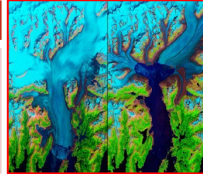
## Evidence for climate change

Earth's temperature has changed over the last 2.6 million years. Scientists know this by collecting a range of evidence that is trapped or stored in the environment around us.

<b>Geological fossil evidence</b>	Plants and animals fossils/remains which favour certain environmental conditions have been found in contractionary conditions, thus suggesting periods of a warmer and colder time. E.g. Mastodon in USA.
<b>Ocean Sediment</b>	Layers of sediment that has built up over time have provided scientists trapped oxygen isotopes. Scientists have used them to calculate and understand that atmospheric temperature have indeed changed.
<b>Ice Cores</b>	Ice cores are made up from different layers that each represents a different historical time. By exploring the water molecules of these cores, scientists have calculated fluctuating temperatures of the atmosphere.
<b>Historical records</b>	Historical records from ancient cave paintings, diaries and written observations have provided evidence of climate change through personal accounts from the people through them.

## Retreat of the Columbia Glacier, Alaska, USA

Located in southern Alaska, it flows 50km to the sea. The glacier has been retreated by 16km and has lost half of its thickness in the last 30 years. Scientists believe this is due to global warming, which if continued will contribute towards continued sea level rises.



## Greenhouse Gases

Most greenhouse gases occur naturally. Some greenhouse gases have greater potential to increase global warming than occurs as different gases trap and absorb different amounts of radiation.

<b>Carbon dioxide</b>	Accounts for 60% of the enhanced greenhouse gases. It is produced by burning fossil fuels through producing electricity, industry, cars and deforestation.
<b>Methane</b>	Accounts for 15% of the enhanced greenhouse gases. 25x more efficient than Carbon dioxide. Produced from landfills, rice and farm animals.
<b>Halocarbons</b>	Human made and makes a tiny proportion of all greenhouse gases. 15000x more efficient at trapping radiation than Carbon dioxide. Produced from air-conditioning, refrigerators and aerosols.
<b>Nitrous Oxide</b>	Accounts for 6% of the enhanced greenhouse effect. 250x more efficient than Carbon dioxide. Produced from fertilisers and car exhausts.

# CHANGING CLIMATE

## Past Evidence: The Little Ice Age (1300-1870)

The Little Ice Age was a period of cooling that occurred after the Medieval Warm Period in parts of Europe and North America. Impacts included...

1. Price of grain increased and vineyards become unproductive.
2. Sea ice engulfed Iceland and the sea force around parts of the UK. Frost Fairs were held on rivers such as the River Thames.
3. People suffered from the intense cold winters as food stock were limited.

## Recent Evidence for climate change.

In the past 100 years, scientists have become pretty good at collecting accurate measurements from around the world. These measurements have suggested a trend that the climate is yet again changing.

<b>Global temperature data</b>	Evidence collected by NASA suggests average global temperatures have increased by more than 0.6°C since 1950.
<b>Ice sheets and glaciers</b>	Evidence from maps and photos have shown many of the world's glaciers and ice sheets are melting. E.g. the Arctic sea ice has declined by 10% in 30 years.
<b>Sea Level Change</b>	Evidence from the IPCC has shown that the average global sea level has risen by 10-20cms in the past 100 years. This is due to the additional water from fresh water ice and thermal expansion of the ocean due to higher temperatures.

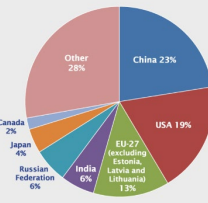
## Evidence of natural change

Climate change has occurred in the past without human ever being present. This suggests that there are natural reasons for the climate to change.

<b>Milankovitch cycle</b>	Milutin Milankovitch argued that climate change was linked to the way the Earth orbits the Sun, and how it wobbles and tilts as it does it. There are three ideas that are thought to change climate. <ol style="list-style-type: none"> <li>1. <b>Eccentricity:</b> Changes in the shape of Earth's orbit.</li> <li>2. <b>Obliquity:</b> Changes in how the Earth tilts on its axis.</li> <li>3. <b>Precession:</b> The amount the Earth wobbles on its axis.</li> </ol>
<b>Sun Spots</b>	Dark spots on the Sun are called Sun spots. They increase the amount of energy Earth receives from the Sun.
<b>Volcanic Eruptions</b>	Volcanoes release large amounts of dust containing gases. These can block out sunlight and result in cooler global temperatures.

## Whose responsible?

<b>LDCs</b>	Countries in Africa, such as Kenya, emit low levels of carbon dioxide. This is due to these countries not being industrialised or having a population wealthy enough to consume lots of energy
<b>EDCs</b>	Countries such as China and India are increasingly more industrialised and therefore are emitting more carbon dioxide. These increasing population sizes and steadily increasing wealth mean more energy is being consumed.
<b>ACs</b>	Countries such as the USA and UK are industrialised with a wealthier population that enjoy lifestyles which required a large consumption of energy.



## Not what it seems

Although China is responsible for the highest amount of carbon emission, 1.4 billion people do live there. However, per person, the USA (320 million) actually contributes far more CO<sub>2</sub> emissions.

## Global impacts of climate change

The impact of rising temperatures is affecting the world socially, economically and environmentally in several potential problematic ways.

<b>Extreme Weather</b>	Climate is causing more unpredictable and severe weather events. This includes more frequent and powerful tropical storms; more extreme heatwaves and lasting droughts. E.g. Typhoon Haiyan 2013
<b>Rising sea levels</b>	Sea levels have risen by 20 cm since 1901. due to thermal expansion, melting glaciers and ice caps. Some coastal countries are now disappearing such as the Maldives in the Indian Ocean.
<b>Food supply</b>	Warmer temperatures and changing rainfall will make it harder to produce a reliable source of food to sustain a rising global population. E.g. In 2011, Russia banned crop exports after a decline in yield.
<b>Plants and Animals</b>	About a quarter of animals and plants on Earth could become extinct. With warmer temperatures and changing rainfall environments will no longer be able to provide for the world's fragile ecosystems.
<b>Disease and Health</b>	Warmer temperatures will increase the spread of infectious diseases like malaria. In addition, more frequent floods could cause more waterborne disease such as dysentery.
<b>Water Supply</b>	People need freshwater to drink but with 1 billion people predicted to not have excess to enough water by 2025 due to climate change, this might cause several social, economic and environmental problems. E.g. fishing, irrigation and sanitation.
<b>Climate refugees</b>	Climate refugees are people who are forced to leave their home due to the impact of climate change. This can be due to sea level rises or extreme weather conditions such as drought.

## Rising Sea Levels: Tuvalu

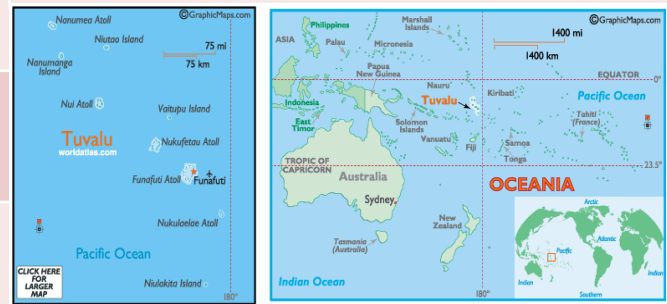
Tuvalu is a group of tiny islands in the South Pacific. Most islands are low-lying with the highest point being 4.5m above sea level. Population is 11,000 people and the economy relies mainly from exporting copra.

### Impacts from climate change

Social	Economic	Environmental
<ul style="list-style-type: none"> <li>- Water supply due to droughts becoming more common.</li> <li>- Wells are becoming polluted by seawater.</li> <li>- High tides are starting to threaten homes and roads.</li> </ul>	<ul style="list-style-type: none"> <li>- Increased levels of salinization affecting soil for agriculture.</li> <li>- Coastal erosion is destroying productive farmland.</li> <li>- Main runway threaten by flooding.</li> </ul>	<ul style="list-style-type: none"> <li>- Ocean acidification is reducing fish stocks around the island.</li> <li>- Warmer temperatures are destroying fragile ecosystems such as coral reefs.</li> </ul>

### Management

- Campaigning internationally for a reduction in carbon emissions.
- Migration to safer islands off the coast of New Zealand.
- Low sea walls have been constructed to prevent erosion and flooding.
- Japan supporting coral reef restoration by introducing new species to damaged reefs.



## Climate change management: Paris Agreement 2015

Paris climate conference involved 195 countries making a legally binding global climate deal. This agreement objective is to limit global warming to below 2°C. The aims of this objective are...

- Limit emissions to pre-industrial levels.
- Meet every 5 years to set new targets.
- Communicate plans to the public.
- Provide support to developing countries at reducing emissions.



## Extreme Weather: Brazilian Drought 2014

Brazil is a EDC in the continent of South America. Its population is 204 million. In 2014 it faced a record breaking dry season that resulted in severe drought conditions. Scientist believe that deforestation may have contributed in changing the climate.

### Impacts from climate change

Social	Economic	Environmental
<ul style="list-style-type: none"> <li>- Drought caused a reduction in the production of hydroelectric power.</li> <li>- Major cities faced water shortages.</li> </ul>	<ul style="list-style-type: none"> <li>- Shortage of water affected industrial production.</li> <li>- Coffee industry was severely affected due to the lack of rainfall.</li> </ul>	<ul style="list-style-type: none"> <li>- As reservoir levels dropped, levels of pollution increased. This damaged natural ecosystems and killed fish.</li> </ul>

### Management

- Introduction of water rationing and recycling more water.
- Repair leaking pipes to decrease water waste.
- Introduction of more natural gas to sustain energy demands.

## Impacts of climate change on the UK.

The UK's climate is also changing. It is expected to...

- Increase in average temperature.
- Have warmer, but wetter winters.
- Have warmer and drier summers.

However, not all the impacts to the UK will be negative, there are clear benefits for a changing climate.

## Negative impacts of climate change for the UK

<b>Coastal Flooding</b> <ul style="list-style-type: none"> <li>• Vulnerable low lying areas could flood homes and infrastructure.</li> <li>• Increase of coastal erosion.</li> <li>• Damage to the economy.</li> </ul>	<b>Extreme Rainfall</b> <ul style="list-style-type: none"> <li>• Increase in extreme flash floods.</li> <li>• Flood damage to homes and businesses.</li> <li>• Soil contaminations on farmland.</li> </ul>
--	--

<b>Water Shortages</b> <ul style="list-style-type: none"> <li>• Farmers will find it difficult to irrigate land.</li> <li>• Water restrictions, with London being worst affected.</li> </ul>	<b>Extreme Heat</b> <ul style="list-style-type: none"> <li>• Warmer weather can increase health problems.</li> <li>• Infectious diseases such as malaria might spread.</li> </ul>
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## Positive impacts of climate change for the UK

<b>Tourism</b> <ul style="list-style-type: none"> <li>• More people likely to take holidays within the UK.</li> <li>• The economy could be boosted: helping to create new jobs.</li> <li>• More outdoor events could become common.</li> </ul>	<b>Environment</b> <ul style="list-style-type: none"> <li>• New wetlands from coastal flooding could become established.</li> <li>• New wildlife and plants could be drawn to the UK.</li> </ul>
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<b>Farming</b> <ul style="list-style-type: none"> <li>• Agriculture productivity may increase under warmer conditions.</li> <li>• Farmers could potentially grow new foods used to warmer climates.</li> </ul>	<b>Industry</b> <ul style="list-style-type: none"> <li>• Heating cost will fall.</li> <li>• Construction industry will be boosted by the need to build sea defences.</li> <li>• New designs produced to cope with conditions.</li> </ul>
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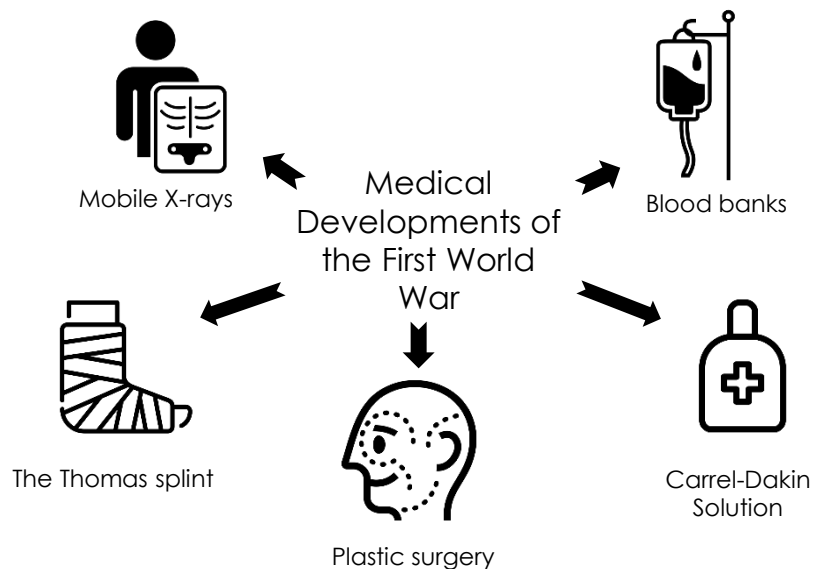
# Year 10 History Term 2 Knowledge Organiser: The Western Front 1914-1918

## Key Dates

<b>Autumn 1914</b>	First Battle of Ypres. Germans build Hill 60.
<b>Spring 1915</b>	Second Battle of Ypres – first use of poison gas.
<b>1915</b>	Introduction of the Brodie helmet
<b>July- November 1916</b>	First Battle of the Somme. 420,000 British troops were killed or injured.
<b>1916</b>	The Thomas splint is first used.
<b>Spring 1917</b>	Battle of Arras – Allied troops dug 19km of tunnels
<b>Winter 1917</b>	Battle of Cambrai – first mass use of tanks.

## Key Words

<b>Trench</b>	Long, narrow ditches dug into the ground where soldiers lived.
<b>Parapet</b>	The front, protective wall of a trench.
<b>FANY</b>	First Aid Nursing Yeomanry – an organisation founded to provide nursing care in war zones.
<b>RAMC</b>	Royal Army Medical Corps. The army organisation that provided medical treatment, From doctors to stretcher bearers.
<b>Artillery</b>	Large guns, like cannons, that fire explosive shells.
<b>Shell</b>	From the word 'bomb shell'. An explosive device fired by artillery.
<b>Shrapnel</b>	Fragments of a bomb or shell thrown out by an explosion.
<b>Triage</b>	Sorting wounded soldiers into groups according to who needs treatment most quickly.
<b>Chlorine gas</b>	A gas – usually green – that would be used as a weapon to choke or suffocate soldiers. At lower concentrations it irritated the eyes, lungs and throat.
<b>Phosgene gas</b>	A deadly clear gas that caused soldiers lungs to slowly fill with fluid. Could cause burning in the eyes and throat.
<b>Mustard gas</b>	A gas that caused soldiers skin and eyes to blister. Could cause temporary blindness.
<b>Trench Fever</b>	A flu-like illness, with a high temperature, caused by lice.
<b>Trench Foot</b>	An infection caused by feet being continuously wet. Could lead to amputation.
<b>Shell Shock</b>	A mental illness caused by stress, trauma and shock.
<b>Compound Fracture</b>	Where a broken bone pierces the skin and comes out of the body. Also known as an open fracture.



## The Chain of Evacuation



# Year 10 History Term 2 Knowledge Organiser: Sources of evidence from the Western Front



## Letters

Soldiers' private letters to family are useful for showing personal experience. Remember they may leave out upsetting details and some sensitive details may have been censored.



## Diaries

These are useful for showing the personal experience and feelings of one person. They are likely to be honest as they are not meant to be read by anyone else.



## Medical Records

These are official documents and needed to be accurate so patients could be treated. Data from medical records can tell us how typical or common illnesses and injuries were.



## Army Records or Archives

These are official documents so needed to be factual and were checked. They can tell us what the general experience of large numbers of soldiers was. They will show accurate numbers of dead and injured soldiers.

## Interviews

Video, audio and written interviews show soldiers' personal experiences. If they happened a long time after the war, some detail may be mis-remembered but people usually remember their feelings well.



## Autobiographies

These show peoples' memories of events and experiences. They are usually written by credible people to inform but they are also intended to sell, so boring details may be left out.



## Photographs

These show a true record of one event. They could not be photoshopped in 1914-18! Some photos are staged (planned to give a certain impression) and some are candid (informal and unplanned).



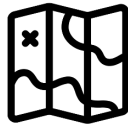
## Paintings & Drawings

These show an artist's interpretation of an event. First World War artists had often experienced the trenches first hand, so were credible sources. However, art may be intended to celebrate or glorify the soldiers so may not show things as they really were.



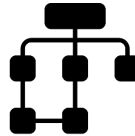
## Newspapers

These are intended to be factual reports and were usually checked for accuracy. Although sensitive information was censored between 1914-1918, these accounts are useful for telling us what people in Britain were told.



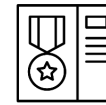
## Maps

Official army maps were important and needed to be highly accurate so soldiers could navigate. Roads and landscapes changed throughout the war, so maps that are dated are the most useful.



## Diagrams & Blueprints

Official army plans, diagrams and blueprints are useful for showing us how things should be generally. They don't take into account specific circumstances e.g. a blueprint for a trench may need to be adapted for some terrains.



## Artefacts

Physical items like weapons, uniforms and preserved trenches from the time are highly useful. Even though they are just one object, they can help us to appreciate the size, feel and shape of things we read about.

## Is this source USEFUL?

**Question 2a** on the final exam, asks you how useful Source A & B are for an enquiry into a specific part of the First World War. You need to explain why each source would be useful for the enquiry based on its **content**, your **own** knowledge and the **provenance** of the source. **ALL** sources are useful!

### CONTENT

Source \_\_\_ is useful because it says/shows ... which suggests that...

### OWN KNOWLEDGE

And I know that... (SPPED)

### PROVENANCE

Source \_\_\_ is also a trustworthy source because...

However, we may not be completely accurate because...

1.1

**1.1.3 Services provided by IT**  
**IT10: Online services**

**What is an online service?**

There are a range of services provided by IT that improves efficiency/productivity for individual users.

**Online shopping**

Online shopping is a convenient way of buying goods. Users can enter the name of a product in a search engine and a list of results appears almost instantly.

**Benefits of online shopping**

- You can search for goods, sort them by price, relevance, reviews.
- Images of the products provided.
- 24/7 Availability
- Read customer reviews
- You can compare prices from different shops
- Book a delivery/collection service.

**Online entertainment**

To access content for our enjoyment and pleasure such as VoD and streaming services.

**Benefits of using a smart TV**

- Apps made available to use.
- Access the internet
- No need to buy an additional smart device as smart TV offers the same functions.

**Benefits of streaming music**

- Accessible on all smart devices.
- Create your own playlists.
- No requirement for additional equipment such as a radio player.
- Access to large libraries of songs and audiobooks.

**Online booking**

Software that's used to manage reservations for business services. Most systems can accept customer payments online as well as making bookings.



1.1

### 1.1.3 Services provided by IT

#### IT10: Online services

#### Online banking

Online banking is a convenient way to organise your finances. It allows you to view multiple accounts so that you can effectively view and manage your transactions.

#### Benefits of online banking

- You can view up to date bank statements
- You can view all incoming and outgoing transactions
- You can make payments online such as a standing order or direct debit.
- You have secure access via a login and encryption tools used by the banks network security system.
- Promotions can be offered to online customers.

#### Online booking

Online gaming is constantly developing. 3D graphics have given game creators the ability to provide life-like textures, realistic physical characteristics and in-game interactions between objects. Special effects allow players to immerse themselves in the online gaming world.

#### Benefits of online gaming

- Players can select the game they want to play, create online accounts
- Interact with other players as well as computer opponents.
- Access games for download 24/7.
- Quick access to games as they can be downloaded straight away with an internet connection.
- Other acceptable answers.

1.1

### 1.1.3 Services provided by IT

#### IT10: Online services

#### Online education

Online learning is when you study at home with all the lessons, materials, support and assessment provided over the Internet

#### Benefits of online education

- It provides the opportunity for teaching material to be more interactive instead of just using a text book as a source.
- Students can interact with each other and teachers through forums or chat facilities.
- It can provide personalised learning.
- It allows students to work from home providing they have access.

#### Blended learning

Blended learning is a mixture of online study and face-to-face teaching in a classroom. Learners spend some time at school or college for lessons taught by teachers or lecturers, and some time learning remotely using digital learning methods.

#### Benefits of blended learning

- Blended learning provides flexibility in terms of time and location.
- Students can access online materials and complete assignments at their own pace and convenience.
- Blended learning enables personalized and individualized instruction.

1.1

### 1.1.3 Services provided by IT

#### IT11: Smart technology

#### Mobile phones

A smartphone is an example of a smart device which provide messaging services, access to the Internet amongst other features.

#### Features:

- Make calls
- Text using SMS
- Torch
- Timer/Stopwatch
- Play games
- Browse the internet
- Calculator
- Photo libraries
- Weather forecasting
- Social media
- Shopping

#### Control systems

A control system is a set of devices that work together to achieve set objectives such as to regulate an environment.

#### Examples:

- Motion-activated security cameras
- Lighting
- Cooking appliances
- Pet feeders.
- Thermostat

#### Wearable technology

The term wearable technology covers any kind of smart electronic device designed to be worn on the body. These 'wearables' can be worn as accessories, embedded in clothing, implanted in the user's body or tattooed on the skin.

#### Examples:

- Heart rate monitors
- Sleep monitors
- Checking glucose levels
- Smart watches
- Fitness trackers (e.g. Fitbit)
- Smart jackets
- Full body suits with sensors.
- Head cameras.

1.1

### 1.1.3 Services provided by IT

#### IT12: Artificial Intelligence

#### What is Artificial Intelligence?

Artificial Intelligence is the broader concept of machines being able to carry out tasks in a way that we would consider "smart".

#### Examples of AI being used.

- Voice assistants
- Driverless cars
- Smart bins
- Smart alarms
- Streaming services
- GPS (Google Maps)
- Healthcare
- Video games

#### Three branches of AI

##### Neural networks

A Neural Network is a computer system designed to work by classifying information in the same way a human brain does. It can be taught to recognise, for example, images, and classify them according to elements they contain.

##### Machine learning

Machine learning use systems that automatically learn and improve from experience without being explicitly programmed.

##### Deep learning

Deep learning closely tries to mimic how the human brain works.

# Mis estudios



Subjects



Opinions



Teachers



Uniform

School subjects	Estudio - I study	el arte dramático/el teatro - drama el dibujo - art el español - Spanish el inglés - English la biología - biology la educación física - pe la física - physics el francés - French el alemán - German la geografía - geography la historia - history la informática - computing la química - chemistry la religión - RS la tecnología - technology la sociología - sociology las matemáticas - maths las ciencias - science las empresariales - business las lenguas/los idiomas - languages	porque - because  es - it is  son - they are	me interesa - interests me me aburre - bores me me fascina - fascinates me me importa - is important to me fácil - easy difícil - difficult duro - hard útil - useful inútil - useless práctico - practical creativo - creative relevante - relevant relajante - relaxing exacto - precise lógico - logical exigente - demanding
	Mi asignatura preferida es... - My favourite subject is...  Me chifla - I'm crazy about  Prefiero - I prefer			me aburre como una ostra - it bores me to death es pan comido - it's a piece of cake  mejor que... - better than peor que... - worse than tan...como... - as...as...

Teachers	El/la profesor/a de (ciencias) - My (science) teacher	es - is  paciente - patient tolerante - tolerant listo - clever trabajador(a) - hardworking simpático - nice	impaciente - impatient severo/estricto - harsh/strict tonto - silly/stupid perezoso - lazy antipático - mean/unpleasant
		enseña bien - teaches well explica bien -explains well tiene buen sentido del humor - has a good sense of humor tiene expectativas altas - has high expectations crea un buen ambiente de trabajo - creates a good working atmosphere nunca se enfada - never gets angry me hace pensar - makes me think nos da consejos/estrategias - gives us advice/strategies nos pone muchos deberes - gives us a lot of homework	

Uniform	Tengo/tenemos que llevar... - I/we have to wear (No) llevo/llevamos - I/we (don't) wear Es obligatorio llevar... - it's compulsory to wear No me gusta llevar - I don't like wearing	un jersey - a jumper un vestido - a dress una camisa - a shirt una corbata - a tie una falda - a skirt unos zapatos - shoes unos calcetines - socks unas medias - tights	blanco - white negro - black morado - purple	porque/ya que/ dado que - because	mejora la disciplina - improves discipline limita la individualidad - limits individuality da un imagen positiva del insti - gives a positive impression of the school ahorra tiempo por la mañana - saves time in the morning
	Ojalá pudiera llevar... - If only I could wear...	unos vaqueros - jeans zapatillas de deporte - trainers	una sudadera - a hoody		

Estudio <b>diez</b> asignaturas <b>incluso</b>	I study <b>10</b> subjects <b>including</b>
El <b>inglés</b> , las <b>matemáticas</b> , las <b>ciencias</b> y el <b>dibujo</b> .	<b>English</b> , <b>maths</b> , <b>science</b> and <b>art</b> .
Mi asignatura preferida es	My favourite subject is
La <b>biología</b> <b>ya que me fascina</b>	<b>biology</b> <b>because it fascinates me</b>
y me gustaría trabajar como <b>biólogo marino</b> en el futuro.	and I would like to work as a <b>marine biologist</b> in the future
<b>aunque puede ser</b> muy <b>difícil</b>	<b>although it can be</b> very <b>hard</b> .
<b>Además</b> me chifla <b>el dibujo</b> porque	<b>Moreover</b> I'm crazy about <b>art</b> because
soy una persona <b>creativa</b> y lo <b>encuentro relajante</b>	I'm a <b>creative</b> person and I <b>find it relaxing</b>
y la profe es <b>paciente</b>	and the teacher is <b>patient</b>
y <b>crea un buen ambiente de trabajo</b>	and <b>creates a good working atmosphere</b>
<b>mientras que</b> mi profe de <b>matemáticas se enfada mucho</b>	<b>whereas</b> my <b>maths</b> teacher <b>gets angry loads</b>
y <b>nos pone muchos deberes</b> .	and <b>gives us lots of homework</b> .
También, no aguanto <b>el inglés</b> <b>dado que</b>	Also I can't stand <b>English</b> <b>because</b>
<b>me aburre como una ostra</b> .	<b>it bores me to death</b> .
Cuando era más joven estudiaba <b>la tecnología</b>	When I was younger I used to study <b>technology</b>
pero <b>no me gustaba</b> ya que	but <b>I didn't like it</b> because
era <b>duro</b> y <b>inútil</b> y	it was <b>hard</b> and <b>useless</b> and
<b>no me interesaba nada</b> .	<b>it didn't interest</b> me at all.

↑                      ↑                      ↑  
**A model text on school subjects**

# El colegio



School facilities



School rules

School facilities	<p>En mi instituto hay... - in my school there is                  mi insti tiene - my school has                  Mi escuela primaria tenía - my primary school had                  En mi escuela primaria había - in my primary school there was...</p>		<p>un salón de actos - a hall                  un comedor - a canteen                  un campo de fútbol - a football pitch                  un patio - a yard/playground                  un gimnasio - a gym                  una piscina - a pool                  una biblioteca - a library                  una pista de tenis - a tennis court                  unos laboratorios - some science labs                  muchas aulas - lots of classrooms                  menos/más exámenes - more/less exams                  más oportunidades para hacer deporte - more sports opportunities</p>	<p>Mi insti es <b>mixto</b> y <b>está situado</b></p> <p>en <b>Liverpool</b>, en el <b>noroeste de Inglaterra</b>.</p> <p>Las clases comienzan a las <b>nueve menos cuarto</b></p> <p>y terminan a las <b>tres y cinco</b>.</p> <p>En mi opinión, el día escolar es <b>muy largo</b></p> <p>y un poco <b>aburrido</b></p> <p>pero <b>trabajo como un burro</b>.</p> <p>Me encanta mi insti porque tiene muchas instalaciones</p> <p><b>como una biblioteca, una piscina y un campo de fútbol enorme</b>.</p> <p>Mi escuela primaria era más <b>pequeña</b></p> <p>y no tenía <b>una piscina</b></p> <p>pero <b>había menos exámenes</b>.</p> <p>Hay muchas reglas en mi insti</p> <p>y <b>pienso que formentan la buena disciplina</b></p> <p>por ejemplo no se debe <b>ser agresivo o dañar las instalaciones</b></p> <p>pero <b>lo que me fastidia es que</b></p> <p>no se permite <b>usar el móvil en clase</b>.</p> <p><b>A mi parecer</b> puede ser muy útil.</p>	<p>My school is <b>mixed</b> and it's <b>located</b></p> <p>in <b>Liverpool</b>, in the <b>Northwest of England</b>.</p> <p>Lessons start at <b>quarter to 8</b></p> <p>and finish at <b>5 past 3</b>.</p> <p>In my opinion, the school day is <b>really long</b></p> <p>and a bit <b>boring</b></p> <p>but <b>I work my socks off</b>.</p> <p>I love my school because it has lots of facilities</p> <p><b>such as a library, a pool and an enormous football pitch</b>.</p> <p>My primary school was <b>smaller</b></p> <p>and it didn't have a <b>pool</b></p> <p>but <b>there were fewer exams</b>.</p> <p>There are lots of rules in my school</p> <p>and <b>I think that they promote good discipline</b></p> <p>for example you mustn't <b>be aggressive or damage the facilities</b></p> <p>but <b>the thing that annoys me is that</b></p> <p>you're not allowed to <b>use your phone in lessons</b>.</p> <p><b>In my opinion</b>, it can be really useful.</p>
	<p>Mi insti es... - my school is...</p>		<p>mixto - mixed                  masculino - all boys                  privado - private</p> <p>feminino - all girls                  público - state school</p>		
	<p>Las clases comienzan a las _____ - classes start at _____ o'clock                  Las clases terminan a las _____ - classes end at _____ o'clock                  La hora de comer/el recreo dura _____ minutos - lunch/break lasts _____ minutes                  El día escolar es muy largo - the school day is really long</p>				
	School rules	<p>No se debe - you mustn't                  Está prohibido - it's not allowed                  No se permite - you're not allowed</p>		<p>dañar las instalaciones - damage the facilities                  ser agresivo o grosero - be aggressive or rude                  correr en los pasillos - run in the corridors                  usar el móvil en clase - use your phone in lessons                  llevar zapatillas de deporte - wear trainers                  comer chicle - chew gum                  llevar joyas/maquillaje - wear jewellery/makeup</p>	
<p>Se debe - you must                  Hay que - you have to                  Tienes que - you have to                  Se permite - you're allowed to</p>		<p>ser puntual - be on time                  respetar el turno de palabra - wait your turn to speak                  respetar a los demás - respect others                  trabajar duro - work hard                  escuchar en clase - listen in class                  hacer los deberes - do your homework</p>			
Las normas - the rules		son - are	<p>demasiado estrictas - too strict                  necesarias - necessary                  importantes - important</p>		
		<p>fomentan la buena disciplina - promote good discipline                  limitan la individualidad - limit individuality                  fastidian a los alumnos - annoy the pupils</p>			
Random	<p>Mi horario - my timetable                  La educación infantil/primaria - pre-school/primary education                  La educación secundaria - secondary education                  El bachillerato - A-Level equivalent in Spain                  La formación profesional - vocational training                  El instituto - secondary school                  Suspender/aprobar un examen - to fail/pass an exam</p>		<p><b>El bachillerato</b> - this is the two final years of school. (English equivalent of 6<sup>th</sup> form) It is split into 4 different pathways: arts, sciences, humanities and social sciences. The subjects you study depend on which pathway you have chosen but every student has to study Spanish language and literature, PE and a foreign language.</p>		

↑  
 A model text on my school

# Year 10 Subject Term Knowledge Organiser: Enterprise and Marketing

## Market Research

Anything a business does to find out potential customers' wants and needs is called market research.

**Primary** methods of research generate new data through **surveys, focus groups, observations** and **interviews**. Data can be expensive to gather, especially if a large amount is needed, but it will be more likely to suit a business's research needs.

**Secondary** sources of market research, such as **competitor research, government publications, books** and **newspapers** use data that already exists. Data is cheaper to obtain and quicker as it has already been generated. The data might not be fully applicable to the business's research needs though.

Data generated from research will either be **quantitative** (numbers and percentages) or **qualitative** (written thoughts and opinions).



## Sampling

The people a business asks to take part in their research are known as the **sample**. How this sample is selected is known as a **sampling method**.

- **Cluster** – selecting people within a particular group (e.g. age)
- **Convenience** – selecting people who are near and willing
- **Random** – choosing people without thought
- **Quota** – people from each group represent the full population.

## Customer Profiles

A Customer Profile is a detailed description of a business's main target customer. They're really specific depictions, so they often include the customer name and picture as well as other key details such as their age, gender, spending habits and lifestyle.

## Market Segmentation

Market segmentation is the process of dividing a market into groups – customers are grouped based on key characteristics such as their **age, gender, occupation, income, location** or **lifestyle** (e.g. Poundland™ segments by income).

Businesses segment their market so they can tailor products to suit their target audience and so they can aim their marketing efforts at their target customer.

## Customer Profile Example

**Name:** Gary Asher

**Age:** 39

**Occupation:** Decorator

Gary lives in Derby with his wife who he married in 2015 and their two children, Izzy and Abbie.

He works full time and, as he has two young children, lives a busy life. He enjoys eating out with his family and plays football at the weekend with a group of friends. He is trying to save as much money as possible to put towards a new house.



# R068

## KNOWLEDGE ORGANISER

### Key Calculations

**Revenue:**

$$\text{Selling Price} \times \text{Number Sold}$$



**Total Costs:**

$$\text{Fixed Costs} + (\text{Variable Cost for 1} \times \text{Number Sold})$$

**Profit or loss:**

$$\text{Revenue} - \text{Total Costs}$$

*It's a loss if the answer is negative*

**Break-even:**

$$\frac{\text{Fixed Costs}}{\text{Selling Price} - \text{Variable Cost per Unit}}$$

*The answer is given in units, not pounds*

## Design Mix Model

This is the combination of what a product does (**function**) with how it looks (**aesthetics**) and how much it costs to make (**economic manufacture**).

New products start as ideas, presented as **mind maps, brain shifters, mood boards, sketches** or **drawings**.

## Pricing

When businesses set a price for a product or service, they consider many factors including being able to cover their costs in order to make a **profit**.

**Pricing strategies** are specific approaches businesses can use when setting their prices and include:

**Competitive Pricing** – where businesses base their prices on those of their rivals.

**Psychological Pricing** – where businesses avoid round/whole numbers for their prices.

**Price Skimming** – where businesses set a high price for a new product and lower this price over time. (£)

**Price Penetration** – where businesses set a low initial price, later increasing this price.

## Risk and Viability

Setting up a new business or launching a new product can be **risky** for a person/business. Market research helps reduce this risk.

**Viability** refers to how successful a product might be – often based on finances – is the break-even point realistic, for example.

# THEMES: RELATIONSHIPS

## Key terms

Roles	Position, status or function of a person in society, as well as the characteristics and social behaviour expected of them.
Cohabitation	Living together in a sexual relationship without being married or in a civil partnership.
Adultery	Voluntary sexual intercourse between a married person and a person who is not their spouse.
Commitment	A sense of dedication and obligation to someone or something.
Contraception	Methods used to prevent a woman from becoming pregnant during or following sexual intercourse.
Gender equality	People of all genders enjoying the same rights and opportunities in all aspects of their lives.
Responsibilities	Actions/ duties you are expected to carry out.

### Crucial Commands:

**Describe:** Say in detail what something or someone is like, and the impact it has. E.g. Describe the meaning of the word Omnibenevolent.

**Explain:** Say why something or someone is important, and the impact it has. E.g. Explain why Jesus' death is important to Christians.

**DISCUSS:** Write about at least two points of view and explain why these points of view are valuable or not. E.g. "The most important Christian belief is Jesus' resurrection" (15 marks)

Human beings are social creatures and relationships are vital to human development and existence. The world's religions have much to say about relationships and the way they are conducted.

### Things to remember:

- Not all Christians or all Muslims will necessarily believe or teach the same things! There are different denominations that will agree/ disagree on many topics
- Society's views on relationships have changed over the centuries and religious belief may sometimes evolve to reflect the needs of society.

Do NOT forget to always think about and discuss how each part of what we learn **IMPACTS** individuals, groups or societies!



## Relationships in the 21<sup>st</sup> century

- Different denominations of Christianity have slightly different beliefs about the nature and role of the family: Catholics – believe the ideal family is the nuclear family Parents must provide a safe and stable home where children are educated in their faith. Quakers – welcome any family where children are taught religious and moral values.
- In Islam, the family consists of a heterosexual couple (man and woman), their children and often extended family. Muslims have a duty to care for parents with kindness and respect when older.

## Sexual relationships

- The Catholic approach to contraception comes from scripture and the teachings of Aquinas in his Natural Law (**5 Precepts**).
  1. Preserve innocent life
  2. Reproduce
  3. Educate children
  4. Order society
  5. Worship God.
- Family planning and birth control is permitted by most Islamic schools of law within a marriage. It is not allowed for unmarried people as sex outside of marriage is **Haram**.

## Marriage and Divorce

- For many Christians, marriage is a **sacrament**. It is a lifelong, **monogamous** union between one man and one woman that is blessed by God. Because of this, to divorce and remarry is seen as committing adultery. (Catholics allow separation but not divorce).
- For many Muslims, a Muslim wedding is performed before Allah as a religious duty. According to the Qur'an, men and women are gifts to each other from Allah. If a couple experience marriage difficulties, there are Muslim counselling services to try to avoid divorce. However, if necessary, divorce is allowed except when **menstruating, pregnant or just after childbirth**.

## Roles of men and women in religion

- Roles of men and women in Christianity is controversial. Traditionally, women and men have different roles, based on interpretations of Christian Scripture. The Bible is believed to have been written in 70CE, since then, society has changed and Christians are challenged with understanding the place of **gender equality**.
- Islam teaches that women and men were created equals by Allah to compliment each other. The Qur'an praises women and men equally. Allah has given each gender their own responsibilities that reflect the roles they were created to take on.



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# Level 1/2 Hospitality and Catering: Unit 2-2.1.1 - Nutrition at different life stages & special dietary needs



## Nutrition at different life-stages

### Adults:

- **Early** – Growth in regard to height of the body continues to develop until 21 years of age. Therefore, all micro-nutrients and macro-nutrients especially carbohydrates, protein, fats, vitamins, calcium and iron are needed for strength, to avoid diseases and to maintain being healthy.
- **Middle** – The metabolic rate starts to slow down at this stage, and it is very easy to gain weight if the energy intake is unbalanced and there isn't enough physical activity.
- **Elderly** – The body's systems start to slow down with age and a risk of blood pressure can increase as well as decrease in appetite, vision and long-term memory. Because of this, it is essential to keep the body strong and free from disease by continuing to eat a healthy, balanced diet.

### Children:

- **Babies** – All nutrients are essential and important in babies, especially protein as growth and development of the body is very quick at this stage. Vitamins and minerals are also important. You should try to limit the amount of salt and free sugars in the diet.
- **Toddlers** – All nutrients remain very important in the diet at this stage as growth remains. A variety of foods are needed for toddlers to have all the micro-nutrients and macro-nutrients the body needs to develop.
- **Teenagers** – The body grows at a fast pace at different times at this stage as the body develops from a child to an adult, therefore all nutrients are essential within proportions. Girls start their menstruation which can sometimes lead to anaemia due to not having enough iron in the body.

## Special Dietary needs

### Different energy requirements based on:

- Lifestyles / Occupation / Age / Activity level  
The amount of energy the body needs is determined with each of the above factors e.g. active lifestyle or physical activity level would need more energy compared to a person being sedentary.

### Medical conditions:

- **Allergens** – Examples of food allergies include milk, eggs, nuts and seafood.
- **Lactose intolerance** – Unable to digest lactose which is mainly found in milk and dairy products.
- **Gluten intolerance** – Follows a gluten free diet and eats alternatives to food containing wheat, barley and rye.
- **Diabetes (Type 2)** – High level of glucose in the blood, therefore changes include reducing the amount of fat, salt and sugar in the diet.
- **Cardiovascular disorder** – Needing a balanced, healthy diet with low levels of salt, sugar and fat.
- **Iron deficiency** – Needing to eat more dark green leafy vegetables, fortified cereals and dried fruit.

### Dietary requirements:

- **Religious beliefs** – Different religions have different dietary requirements.
- **Vegetarian** – Avoids eating meats and fish but does eat dairy products and protein alternatives such as quorn and tofu.
- **Vegan** – Avoids all animal foods and products but can eat all plant-based foods and protein alternatives such as tofu and tempeh.
- **Pescatarian** – Follows a vegetarian diet but does eat fish products and seafood.

# Level 1/2 Hospitality and Catering: Unit 2-2.1.1 - Understanding the importance of nutrition



## The importance of nutrition

Listed below are the macro-nutrients and micro-nutrients. You need to know their function in the body and know examples of food items for each. You need to know why they are needed in the diet and why there is a need for a balanced/varied diet.

### Macro-nutrients

**Carbohydrates** - Carbohydrates are mainly used in the body for energy. There are two types of carbohydrates which are:

- **Starch** - Examples include bread, pasta, rice, potatoes and cereals.
- **Sugar** - Examples include sweets, cakes, biscuits & fizzy drinks.

**Fat** - This is needed to insulate the body, for energy, to protect bones and arteries from physical damage and provides fat soluble vitamins. There are two main types of fat which are:

- **Saturated fat** - Examples include butter, lard, meat and cheese.
- **Unsaturated fat** - Examples include avocados, plant oils such as sunflower oil, seeds and oily fish.

**Protein** - Protein is mainly used for growth and repair in the body and cell maintenance. There are two types of protein which are:

- **High biological value (HBV) protein** - Includes meat, fish, poultry, eggs, milk, cheese, yogurt, soya and quinoa.
- **Low biological value (LBV) protein** - Includes cereals, nuts, seeds and pulses.

### Micro-nutrients

#### Vitamins

- **Fat soluble vitamin A** - Main functions include keeping the skin healthy, helps vision in weak light and helps children grow. Examples include leafy vegetables, eggs, oily fish and orange/yellow fruits.
- **Fat soluble vitamin D** - The main function of this micro-nutrient is to help the body absorb calcium during digestion. Examples include eggs, oily fish, fortified cereals and margarine.
- **Water soluble vitamin B group** - Helps absorb minerals in the body, release energy from nutrients and helps to create red blood cells. Examples include wholegrain foods, milk and eggs.
- **Water soluble vitamin C** - Helps absorb iron in the body during digestion, supports the immune system and helps support connective tissue in the body which bind cells in the body together. Examples include citrus fruits, kiwi fruit, cabbage, broccoli, potatoes and liver.

#### Minerals

- **Calcium** - Needed for strengthening teeth and bones. Examples include dairy products, soya and green leafy vegetables.
- **Iron** - To make haemoglobin in red blood cells to carry oxygen around the body. Examples include nuts, beans, red meat and green leafy vegetables.
- **Sodium** - Controls how much water is in the body and helps with the function of nerves and muscles. Examples include salt, processed foods and cured meats.
- **Potassium** - Helps the heart muscle to work correctly and regulates the balance of fluid in the body. Examples include bananas, broccoli, parsnips, beans, nuts and fish.
- **Magnesium** - Helps convert food into energy. Examples include wholemeal bread, nuts and spinach.
- **Dietary fibre (NSP)** - Helps digestion and prevents constipation. Examples include wholegrain foods (wholemeal pasta, bread and cereals), brown rice, lentils, beans and pulses.
- **Water** - Helps control temperature of the body, helps get rid of waste products from the body and prevents dehydration. Foods that contain water naturally include fruits and vegetables, milk and eggs.

# Level 1/2 Hospitality and Catering: Unit 2-2.1.2 - How cooking methods can impact on nutritional value



## Boiling

- Up to 50% of vitamin C is lost when boiling green vegetables in water.
- The vitamin B group is damaged and lost in heat.

## Poaching

- The vitamin B group are damaged in heat and dissolve in water.

## Roasting

- Roasting is a method of cooking in high temperatures and so this will destroy most of the group C vitamins and some of the group B vitamins.

## Frying

- Using fat whilst frying increases the amount of vitamin A the body can absorb from some vegetables
- Cooking in fat will increase the calorie count of food e.g deep fat frying foods.

## Stir-frying

- The small amount of fat used whilst stir-frying increases the amount of vitamin A the body can absorb from some vegetables.
- Some vitamin C and B are lost due to cooking in heat for a short amount of time.

## Steaming

- Steaming is the best cooking method for keeping vitamin C in foods.
- Only up to 15% of vitamin C is lost as the foods do not come into contact with water.

## Grilling

- Using this cooking method can result in losing up to 40% of group B vitamins.
- It is easy to overcook protein due to the high temperature used in grilling foods.

## Baking

- Due to high temperatures in the oven, it is easy to overcook protein and damage the vitamin C and B group vitamins.



### Sustainability

Many diners are interested in hospitality and catering provisions that provide sustainable dining.

The aim of the three Rs of sustainability is to conserve natural resources and prevent excess waste. By following the rules of reduce, reuse, and recycle, hospitality and catering provisions can save money at the same time as attracting more diners and bringing in more profit.

Sustainability also means buying local produce, using organic ingredients, buying meat and poultry from farm assured producers who guarantee better welfare for the animals, using Marine Stewardship Council sustainable fish and offering meat-free versions of favourite dishes.

### Reduce

**Food waste:** If food and waste were its own country, it would be the third largest producer of greenhouse gas in the world! If it cannot be used to make new dishes or given away, then as much food waste as possible should be composted.

**Energy use:** Hospitality and catering provisions can save energy in many ways including using low-energy lighting, maintaining and upgrading equipment, putting lids on saucepans, batch baking and cooking.

**Food miles:** Using local suppliers means that the food does not have to travel as far from 'field to fork'.

**Water usage:** Use less in cooking by only just submerging vegetables or using a steamer. Use an energy and water efficient dishwasher.

### Reuse

Food that is past its best, for example a brown banana, or scraps such as bones can be used to create new dishes which in turn will decrease food waste. [www.lovefoodhatewaste.com](http://www.lovefoodhatewaste.com) has a vast range of recipe ideas for using surplus food.

- Bread: breadcrumbs, bread and butter pudding, bread sauce and croutons.
- Meat and poultry: bones can be used to make stocks.
- Fruit: banana muffins, apple crumble, fruit coulis, smoothies.
- Vegetables: bubble and squeak, vegetable stock, vegetable bakes, omelettes.
- Eggs: whites can be used to make meringue; yolks can be used to make mayonnaise.

### Recycle

Many hospitality and catering provisions have separate bins for recyclable materials. Professional kitchens should also have areas to separate waste into recyclable, non-recyclable and compostable materials. All staff should be trained to know how to dispose waste correctly.

Coffee grounds can be composted. Compost can be used to grow fruit, vegetables and herbs for use in the kitchen.

Jars and plastic containers can be used for storage in the kitchen. Glass bottles can be used to hold flowers or candles as table decorations.

*Too Good To Go*, *Karma* and *Olio* are apps used by restaurants and supermarkets. Customers can buy discounted food which would otherwise go into landfill.

You need to be able to plan dishes for a menu as well as know, understand and include the following:

### Commodity list with quantities

This means naming all the ingredients needed to make all dishes and how much of each one e.g. grams (g), ounces (oz), millilitres (ml), etc.

### Contingencies

This means stating, in the plan, what you would do to deal with a problem if something were to go wrong.

### Equipment list

Naming all pieces of equipment you would need to cook the dishes, which also includes specialist equipment such as pasta machines and ice cream makers as well as saucepans, chopping boards, knives, etc.

### Health, safety and hygiene

Stating in the plan, points regarding the health, safety and hygiene. The use of temperature probes to ensure foods are cooked, correctly using colour coded chopping boards or washing hands after handling raw meat are a few examples.

### Quality points

These include naming any quality points to consider in the preparation, cooking and serving stage of the plan. Examples could include checking foods are in use by/best before dates, dishes are cooked to minimum temperatures, ingredients stored in correct places and correct temperature, etc.

### Sequencing or dovetailing

This means you fit together the different steps and activities in logical order when planning to cook more than one dish.

### Timing

You need to state realistic timings of how long each step is likely to take throughout your plan to give accurate information of how long your dishes take to complete.

### Mise en place

This is all the preparation you undertake before cooking. Examples of this include weighing out ingredients, collecting equipment and washing hands.

### Cooking

Throughout your plan, you will need to state how you ensure food is cooked correctly, e.g. chicken is white in the middle, using a temperature probe, etc.

### Cooling and hot holding

Cooling dishes correctly within 1.5hrs to 8 degrees and keeping hot dishes for service at 63 degrees should be mentioned in your plan for relevant dishes, as well as how you would ensure these temperatures are met, e.g. by using temperature probes.

### Serving

Once you have finished cooking your dish or dishes, you need to state how you would present your dish/dishes, e.g. on plate, bowl, etc., as well as what decoration, garnishes and sauces you include before serving.

### Storage

In your plan, you should state where different kinds of ingredients need to be stored, e.g. raw chicken in the fridge or frozen fruit in the freezer and at what temperatures these pieces of equipment need to be (fridge needs to be 0–5 degrees and freezer needs to be -18 degrees).



## Creativity

It is said that 'we eat with our eyes'. Creativity in plating dishes enhances the diner's experience – diners want to be 'wowed' when their meal appears!

**Serving dishes:** Start with the plate – varied sizes, shapes and colours can add immediate impact to your dish. Dishes served in bowls or dessert glasses should be placed on a plate to aid serving.

**Elements:** Each dish will consist of several elements – the main protein, accompaniments, garnish and decoration.

**Volume:** Do not overcrowd the plate – leave some space so that the diner can see each element of the dish. The rule of thumb is that only two-thirds of the plate should be full.

**Height:** Food can be stacked to add height to the overall dish, but each element should be visible.

**Colour:** Accompaniments, garnishes and decoration can add colour to dishes where the main elements are similar in colour. An example is fish and chips: bright green peas and a slice of yellow lemon will enhance the overall appearance of the meal.

**Functionality:** The dish should be beautiful to look at, but easy for the diner to eat.

**Temperature:** Hot food should be served on hot plates. Cold food should be served on chilled plates.

## Accompaniments

Accompaniments should be chosen to complement the main part of the dish. Examples include:

### Carbohydrate accompaniments:

- Savoury: bread, dauphinoise potatoes, pilau rice.
- Sweet: shortbread, brandy snaps, macaron.

### Fruit and vegetable accompaniments:

- Savoury: pea purée, roasted root vegetables, griddled asparagus.
- Sweet: berry compote, fruit kebabs, grilled peaches.

### Sauces:

- Savoury: gravy, red wine jus, parsley sauce.
- Sweet: custard, salted caramel sauce, chocolate sauce.

## Portion control

It is important that the customer is satisfied with their portion without the plate being overcrowded. Keeping portion control accurate allows hospitality and catering provisions to order adequate supplies of ingredients. Accurate portion control will also help prevent food waste.

## Garnish

Garnishes are additions to a dish which both add to the overall taste and enhance the overall appearance.

**Savoury:** parmesan crisps, crispy onions, caviar, watercress, lemon wedges, fresh herbs, salsa, edible flowers.

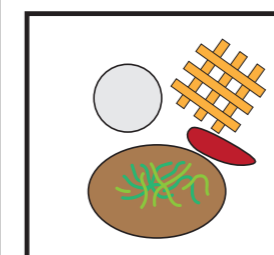
**Sweet:** chocolate dipped strawberries, tuile biscuits, chopped nuts, tempered chocolate work, spun sugar work, edible flowers.

## Decoration

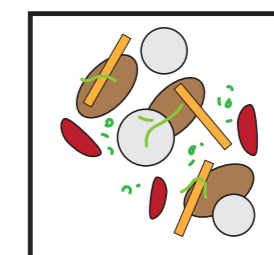
Decoration adds drama to the finished dish but it is not meant to be eaten or add to the overall flavour of the dish. Examples include:

- whole spices added to pilau rice
- gold leaf
- hollow eggshell as serving dish.

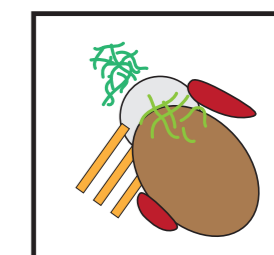
## Plating styles



Classic



Freeform



Landscape



## Food safety practices

During your practical session, you must demonstrate that you can work safely and hygienically. Your plan should show that you have thought about food safety and hygiene during all parts of your practical session. Your personal safety and hygiene practices will be observed during your practical session.

### Personal safety and hygiene practices

#### Hands:

- Wash before, during and after preparing food especially after touching raw meat, dirty vegetables and fridge handles.
- Wash after going to the toilet.
- Wash after sneezing or blowing your nose.
- Wash after disposing of waste.

#### Clothing and hair:

- Clean apron and/or chef's whites.
- Non-slip closed-toe shoes.
- Tie hair back.
- Wear a bandana or hair net.

#### Cuts:

- Cover with a blue, waterproof plaster.

#### Equipment:

- Handle knives safely.
- Use oven gloves when carrying hot items.
- Keep electrical equipment away from water.
- Clean spills immediately.

### Food safety and hygiene practices

#### Ingredients:

- Check use-by and best before dates.
- Check ingredients for freshness; no bruises on fruit, fish should not smell.
- Store correctly until needed.

#### Cleaning:

- Clean worktops before preparation.
- Clean workstation and equipment after preparing high-risk foods.
- Wash up throughout the session – do not leave it all until the end!

#### Temperatures:

- Keep high-risk foods in the fridge (0°C – 5°C) until needed.
- Use a temperature probe to check core temperature of high-risk foods.

#### Waste management:

- Keep waste separate from ingredients during preparation, cooking and serving.
- Recycle and compost waste if possible.

### Management of accidents

- Ensure that you know the location of the First Aid box.
- Ensure that you know how to use a fire blanket or fire extinguisher.





## Dish production

- Were you able to keep to your time plan?
- Did you have any problems during the practical? How did you resolve them?

## Dish selection

- Did your dishes contain the right nutrients for your two groups?
- Were they expensive or cheap to produce?
- Did they contain seasonal or local produce?

## Organoleptic

How did your dishes:

- Look (appearance)?
- Taste (flavour and texture)?
- Smell (aroma)?

## Hygiene

- Did you follow all hygiene guidelines?
- Did you wear correct PPE?
- Did you wash up between jobs?

## Reviewing of dishes

### PEE: Point, Evidence, Explain

You need to write a self-reflection of how you performed during your practical session. There are 8 areas to consider when you write your review of your dishes.

## Presentation

- Were the portions the right size for your two groups?
- How did you add colour to your dishes?
- Were your garnishes and decorations appropriate?

## Health and safety

- Were you able to use equipment safely?
- Did you store ingredients correctly?

## Waste

- Did you separate your waste into categories? (Food waste, recyclable materials, general waste.)
- Did you buy the right amount of ingredients?

## Improvements

- If you made your dishes again, what would you do differently?
- If you had to do the task again, would you change your choice of dishes?
- Would you add additional accompaniments?



### Decision making

- What were your strengths in completing the written tasks?
- What were your strengths in choosing dishes?
- How could you improve weak decisions?
- Were the dishes easy to make together?
- What were the disadvantages of the chosen dishes?
- Did your dishes meet the needs of the provision?
- Did your dishes meet the needs of your two groups (nutrition and cost)?

### Planning

Was the practical session plan in a logical order?

- Discuss your strengths.
- Discuss your weaknesses.
- Suggest improvements.

Were you able to keep to the plan during the practical session?

- Discuss your strengths.
- Discuss your weaknesses.
- Suggest improvements.

### Organisation

How did you organise your written tasks?

- Discuss your strengths.
- Discuss your weaknesses.
- Suggest improvements.

How did you organise your workstation during the practical session?

- Discuss your strengths.
- Discuss your weaknesses.
- Suggest improvements.

### Time management

How did you manage your time when completing the written tasks?

- Discuss your strengths.
- Discuss your weaknesses.
- Suggest improvements.

How did you manage your time during the practical session?

- Discuss your strengths.
- Discuss your weaknesses.
- Suggest improvements.



### Factors affecting menu planning

You need to be aware of the following factors when planning menus:

- **cost** (ingredients as well as business costs)
- **portion control** (value for money without waste)
- **balanced diets/current national advice**
- **time of day** (breakfast, lunch, and dinner menus as well as small plates and snacks)
- **clients/customers** (a menu with prices that will suit the people who visit your establishment).

### Equipment available

You need to know and understand the type of equipment needed to produce a menu. The choice of dishes will be influenced by the equipment available to the chef.

This includes kitchen equipment such as:

- hobs, ovens, and microwaves
- fridge, freezer and/or blast chiller
- specialist equipment, for example a *sous vide* or pizza oven
- hand-held equipment, for example electric whisks or hand-blenders
- other electric equipment, for example food processors.

### Skills of the chef

The skills of the chef must be suited to the type of provision and the menu offered.

A Michelin starred restaurant will require a chef who has complex skills in preparation, cooking and presentation of dishes.

A café will require a chef who has a range of medium and complex skills to produce a suitable menu.

A large restaurant will normally have a full kitchen brigade while a smaller establishment may only have a single chef with one or two assistants.

### Time available

The type of provision will influence the amount of time a customer may be willing to wait for their dish to be prepared. Can the chef prepare, cook, and present more than one dish at the same time? Can some items be made in advance?

### Time of year

The time of year can affect menu choices. Light and cold dishes such as salads are better suited to the summer months. Hearty dishes such as stews are more suited to the winter. Special dishes linked to holidays such as Christmas and Valentine's Day may also be included. The availability of **seasonal** produce can also affect menu choices as certain commodities, for example strawberries, are less expensive when in season.

### Environmental issues

The chef will need to think about environmental issues when planning a menu. Can the chef **reduce** the amount of ingredients bought as well as reducing food waste? Can the chef **reuse** ingredients to create new dishes for example stale bread made into bread-and-butter pudding? Can the kitchen **recycle** waste wherever possible? Running the kitchen sustainably will save money.

### Organoleptic properties

Organoleptic properties are the sensory features of a dish (**appearance, aroma, flavour, and texture**).

The chef will need to think about how the dish will look and taste. Is there a range of colours? Do the flavours go well together? Are there a variety of textures?



### Skills and techniques

You need to be able to identify the different types of skills you need to produce your selected dishes. Some dishes will require the use of more complex skills. You will need to demonstrate a range of skills when producing your chosen dishes.

Preparation and cooking skills are categorised as follows: **basic**, **medium**, and **complex**.

### Presentation

You should know and understand the importance of using the following appropriate presentation techniques during the production of dishes:

- creativity
- garnish and decoration
- portion control
- accompaniments.

### Basic preparation skills and techniques

Blending, beating, chopping, grating, hydrating, juicing, marinading, mashing, melting, peeling, proving, sieving, tenderising, trimming, and zesting.

### Medium preparation skills and techniques

*Baton*, *chiffonade*, creaming, dehydrating, deseeding, dicing, folding, kneading, measuring, mixing, puréeing, rub-in, rolling, skinning, slicing, spatchcocking, toasting (nuts/seeds) and weighing.

### Complex preparation skills and techniques

*Brunoise*, crimping, de-boning, filleting, *julienne*, laminating (pastry), melting using *bain-marie*, mincing, piping, and segmenting, shaping, unmoulding and whisking (aeration).

### Basic cooking skills and techniques

Basting, boiling, chilling, cooling, dehydrating, freezing, grilling, skimming, and toasting.

### Medium cooking skills and techniques

Baking, blanching, braising, deglazing, frying, griddling, pickling, reduction, roasting, sautéing, steaming, stir-frying, and using a *sous vide* (water bath).

### Complex cooking skills and techniques

Baking blind, caramelising, deep fat frying, emulsifying, poaching, and tempering.