



Rayner Stephens  
HIGH SCHOOL

**YEAR 11**

**KNOWLEDGE ORGANISERS**

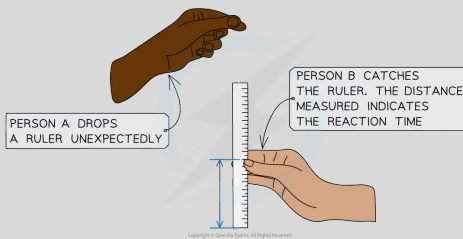
**Autumn Term 2024/25**



## Key Vocabulary:

1	Central Nervous System CNS	The part of the nervous system where information is processed. It is made up of the brain and spinal cord.
2	Peripheral Nervous System	This consists of the nerves which branch out from the brain and spinal cord.
3	Effectors	Are (usually muscles or glands) that bring about responses in the body.
4	Neurons	Basic cells of the nervous system that carry minute electrical impulses.
5	Receptors	Cells that detect stimuli – changes in the internal or external environment
6	Synapses	A gap between two neurones
7	Co-ordination centres	Areas that receive and process the information from receptors

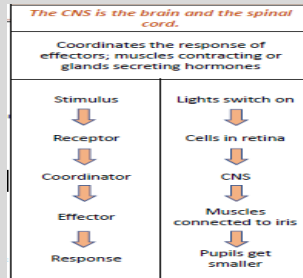
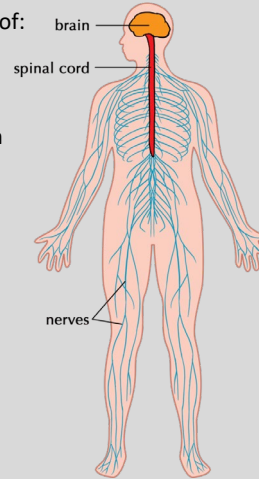
## Investigating Reaction Time



- Reaction time is the time taken to respond to a stimulus; reactions are usually very quick responses typically taking less than a second to occur
- You could investigate the effect of background noise or consumption of caffeine on how quickly a person catches a ruler.

## 10 The human nervous system

- The human nervous system consists of:
1. The central nervous system (CNS):
    - The brain and spinal cord
  2. The peripheral nervous system
    - nerve cells that carry information to or from the CNS.

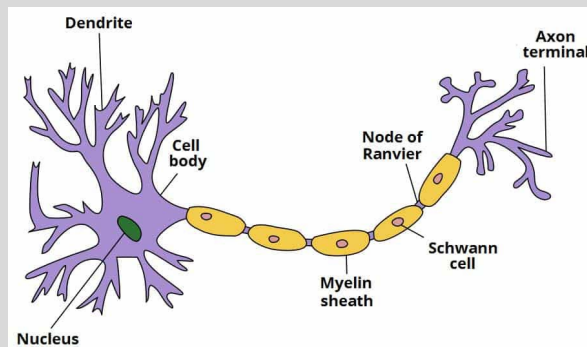


## 11 Nerve Cells

Nerve cells are called **neurones**. They are adapted to carry electrical impulses from one part of the body to another. There are three main types of neurone:

- **sensory neurones**
- **relay neurones**
- **motor neurones**

They have some features in common: the cell body that contains the **nucleus**, organelles and most of the **cytoplasm** of the neurone. One or more **dendrons**, which carry nerve impulses towards the cell body, and an **axon**, a single fibre that carries nerve impulses away from the cell body a fatty, myelin sheath, that covers and insulates the neurone.



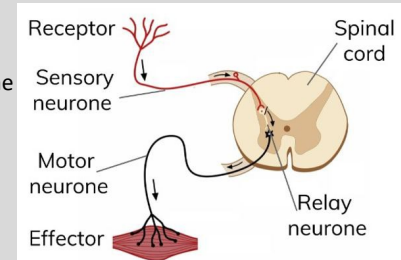
## 12 Types of Neurones

- **Sensory neurones** carry electrical signals - nerve impulses - towards the central nervous system (spinal cord and brain). The signal starts in a receptor which detects a change.
- **Relay neurones** carry nerve impulses within the central nervous system.
- **Motor neurones** carry nerve impulses away from the central nervous system. The neurone ends in either a muscle or glands which are effectors.

## 13 Reflex actions.

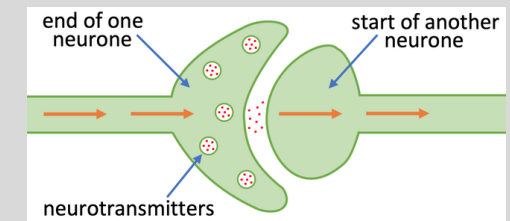
A **reflex action** is an automatic and rapid response to a **stimulus** - we do not have to think about a response. Reflex actions minimise damage to the body from potentially harmful conditions, such as touching something hot. Different types of **neurones** work together in a reflex action. A reflex action follows this general sequence:

1. Receptor
2. Sensory neurone
3. Relay neurone
4. Motor neurone
5. Effector



## 14 Synapses

Neurones do not connect physically with one another. Where neurones meet, there is a small gap called a **synapse**.



# Year 11 Knowledge Organiser Feedback and Control 2 Combined

## Key Vocabulary:

1	Homeostasis	The regulation of the internal conditions of a cell or organism to maintain optimum conditions for function, in response to internal and external changes.
2	Hormones	In animals, they are chemicals that are produced in glands and have an effect elsewhere in the body.
3	Endocrine system	The endocrine system is made of organs called glands that produced hormones.
4	Insulin	A hormone involved in controlling blood glucose levels.
5	Pancreas	The pancreas is a large gland that produces digestive enzymes and insulin.
6	Diabetes	A health condition where the body cannot control blood glucose levels, when either the pancreas does not produce insulin or where the body does not respond to the insulin.
7	Adrenaline	Increases breathing rate, heart rate, flow of blood to muscles, conversion of glycogen to glucose
8	Oestrogen	Female hormone released from the ovaries that controls female development during puberty.
9	Testosterone	Male hormone released from the testes that controls male development during puberty.
10	Pituitary Gland	'The master gland' found in the hypothalamus, it secretes hormones can also act on other glands to stimulate the release of different types of hormones and bring about effects.

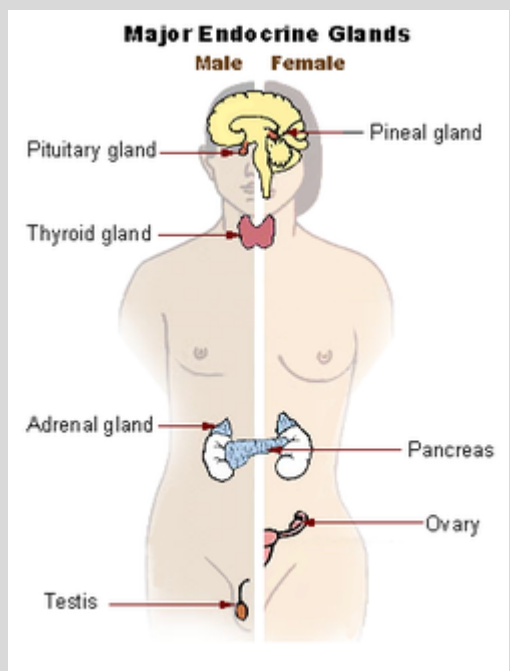
## 11 Homeostasis

Homeostasis maintains optimal conditions for enzyme action throughout the body, as well as all cell functions. It is the maintenance of a constant internal environment despite changes in internal and external conditions.

In the human body, these include the control of:

- blood
- glucose
- concentration
- body temperature
- water levels

## 12 Endocrine System

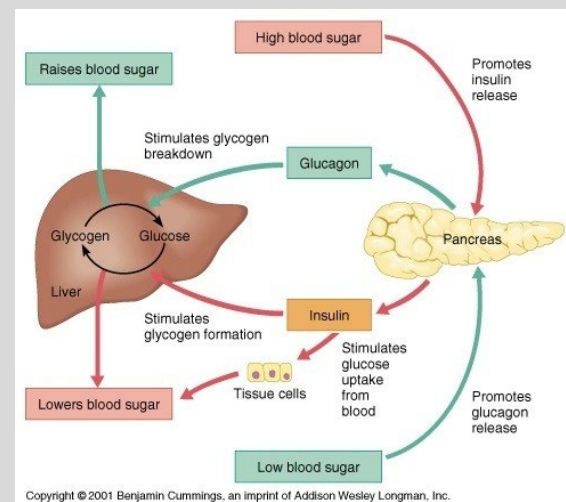


- The endocrine system is composed of glands which secrete chemicals called hormones directly into the bloodstream.
- The blood carries the hormone to a target organ where it produces an effect.
- Compared to the nervous system the effects are slower but act for longer.

## 13 Controlling Blood Glucose

Blood glucose concentration is monitored and controlled by the pancreas.

1. If the blood glucose concentration is too high, the pancreas produces the hormone insulin that causes glucose to move from the blood into the cells.
2. In liver and muscle cells excess glucose is converted to glycogen for storage.
3. (HT only) If the blood glucose concentration is too low, the pancreas produces the hormone glucagon that causes glycogen to be converted into glucose and released into the blood.



## 14 Diabetes

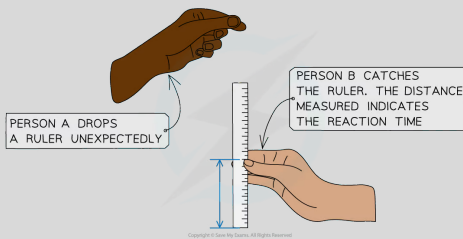
Diabetes	
Type 1	Type 2
Pancreas fails to produce sufficient insulin leading to uncontrolled blood glucose levels. Normally treated by insulin injection.	Obesity is a risk factor. Body cells no longer respond to insulin. Common treatments include changing by diet and increasing exercise.

# Year 11 Science Knowledge Organiser Feedback and Control Triple 1

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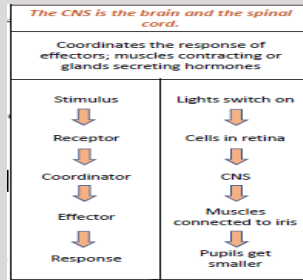
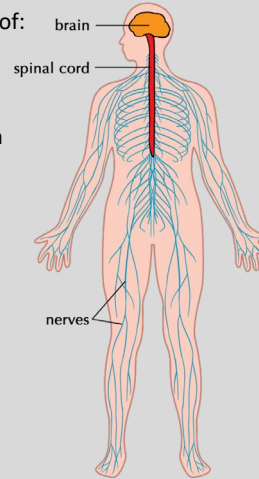
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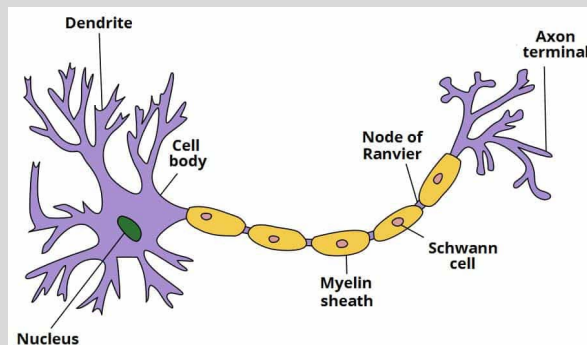


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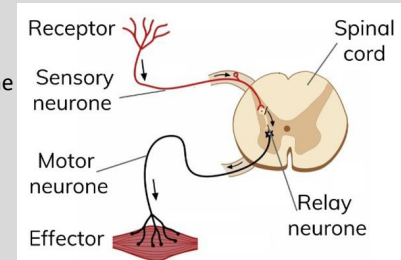
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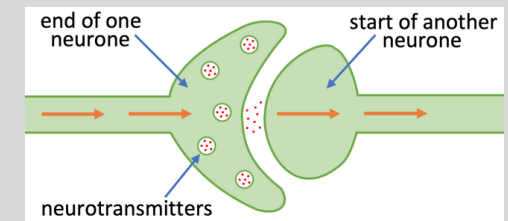
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# Year 11 Knowledge Organiser Feedback and Control 3 Triple

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11	Homeostasis
	Homeostasis maintains optimal conditions for enzyme action throughout the body, as well as all cell functions. In the human body, these include the control of: <ul style="list-style-type: none"> <li>• blood</li> <li>• Glucose concentration</li> <li>• body temperature</li> <li>• water levels</li> </ul>
12	Endocrine System
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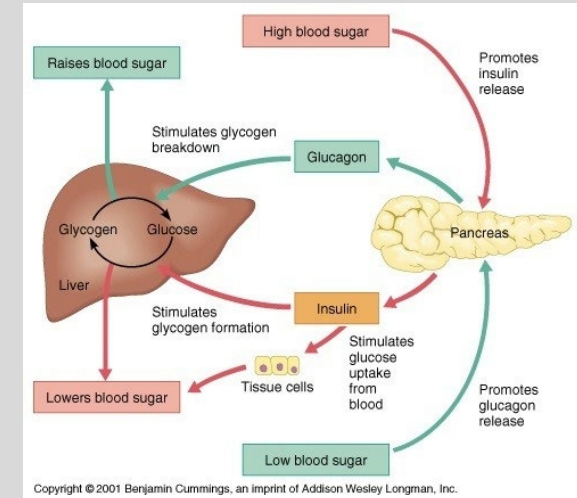
### Major Endocrine Glands

Male Female

### 13 Phototropism

13	Plant Hormones	
Plant responses using hormones (auxins)	<b>Light (phototropism)</b>	Light breaks down auxins and they become unequally distributed in the shoot. The side with the highest concentration of auxins has the highest growth rate and the shoot grows toward the light.
	<b>Gravity (geotropism or gravitropism)</b>	Gravity causes an unequal distribution of auxins. In roots the side with the lowest concentration has the highest growth rate and the root grows in the direction of gravity.
		In new shoots from a seedling the unequal distribution of auxins causes the shoot to grow away from gravity.

14	Controlling Blood Glucose
	Blood glucose concentration is monitored and controlled by the pancreas. <ol style="list-style-type: none"> <li>1. If the blood glucose concentration is too high, the pancreas produces the hormone insulin that causes glucose to move from the blood into the cells.</li> <li>2. In liver and muscle cells excess glucose is converted to glycogen for storage.</li> <li>3. (HT only) If the blood glucose concentration is too low, the pancreas produces the hormone glucagon that causes glycogen to be converted into glucose and released into the blood.</li> </ol>



15	Diabetes	
	<b>Type 1</b>	<b>Type 2</b>
	Pancreas fails to produce sufficient insulin leading to uncontrolled blood glucose levels. Normally treated by insulin injection.	Obesity is a risk factor. Body cells no longer respond to insulin. Common treatments include changing by diet and increasing exercise.

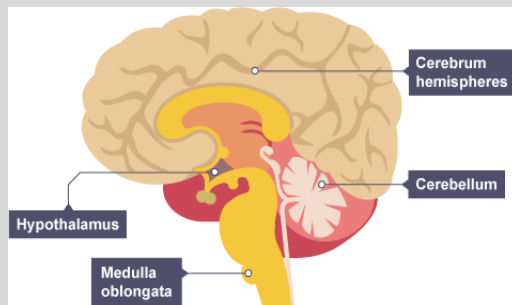
# Year 11 Science Knowledge Organiser. Human nervous system Triple part 2

## Key Vocabulary:

1	Accommodation	The process of changing the shape of the lens to focus on near or distant objects.
2	Suspensory ligaments	The ligaments that connect the lens of the eye to the ciliary muscles.
3	Ciliary muscles	Muscles that contract and relax to change the shape of the eye.
4	Myopia	Short sightedness, where the rays of light from close objects can be focused clearly on the retina but rays from distant objects are not focused and appear blurred.
5	Hyperopia	Long sightedness, where the rays of light from distant objects can be focused clearly on the retina but rays from close objects are not focused and appear blurred.
6	Electro-encephalograms EEGs	Recording of electrical brain activity. A painless test where small sensors are attached to the scalp to pick up electrical signals.
7	Magnetic Resonance Imaging. MRI	An imaging technique that uses strong magnetic fields and radio waves to show details of brain structure and function.
8	Retina	Part of the eye with light sensitive cells

## 9 The Brain

There are four main areas in the brain:  
 The **cerebrum** (the outer layer is called the cerebral cortex), which is split into two hemispheres and is highly folded. It controls intelligence, personality, conscious thought and high-level functions, such as language and verbal memory.  
 The **cerebellum**, which controls balance, co-ordination of movement and muscular activity.  
 The **medulla**, which controls unconscious activities such as heart rate and breathing rate,  
 The **hypothalamus**, which is the regulating centre for temperature and water balance within the body



## 10 Investigating the Brain.

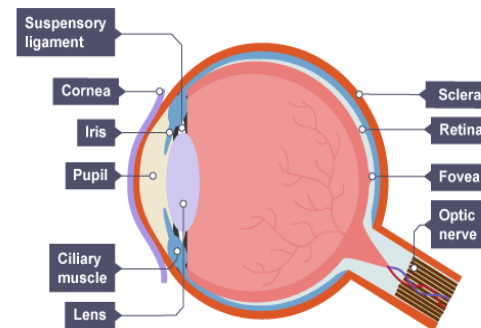
Modern science has allowed scientists to discover how different parts of the brain function. Neuroscientists have been able to map various regions of the brain to particular functions by studying patients with brain damage, electrically stimulating different parts of the brain and using **MRI** scanning techniques.

**Electrical stimulation**  
 Scientists have stimulated different parts of the brain with a weak electrical current and asked patients to describe what they experienced. If the motor area is stimulated, the patient makes an involuntary movement. If the visual area is stimulated, they may see a flash of colour. EEGs (Electroencephalograms) can be created and studied, to observe the electrical activity in the brain.

**MRI brain scans**  
 Modern imaging methods such as MRI (Magnetic Resonance Imaging) scans, use strong magnetic fields and radio waves to show details of brain structure and function. Patients are asked to perform various tasks and, by looking at the scan, scientists can see which parts of the brain are active when the task is carried out.

## 11 The Eye

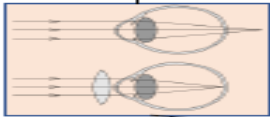

The eye is a sense organ containing **receptors** sensitive to light intensity and colour.



## 12 Parts of the eye.

Structure	Function
Cornea	Refracts light - bends it as it enters the eye
Iris	Controls how much light enters the pupil
Lens	Further refracts light to focus it onto the retina
Retina	Contains the light receptors
Optic nerve	Carries impulses between the eye and the brain
Sclera	Tough white outer layer of the eye. It helps protect the eye from injury

## 13 Eye Problems

<i>Hyperopia (long sightedness)</i>	<i>Myopia (short sightedness)</i>
Treated using a convex lens so the light is focused on the retina.	Treated using a concave lens so light is focused on the retina.
	
New technologies now include hard/soft contact lens, laser surgery to change the shape of the cornea and a replacement lens in the eye.	

# Year 11 Science Knowledge Organiser – Organic Reactions 1

Key Vocabulary:			Reactions of Alkenes		TRIPLE ONLY	
1	<b>Alcohol</b>	A group of organic compounds that have the same functional group (-OH, hydroxyl group)	10	<b>Combustion of Alkenes</b>	15	<b>Alcohols</b>
2	<b>Alkene</b>	Unsaturated hydrocarbon, which contains a carbon-carbon double bond, with the general formula $C_nH_{2n}$	11	<b>Addition Reactions of Alkenes</b>		
3	<b>Carboxylic Acids</b>	All carboxylic acids contain the -COOH functional group.	12	<b>Reactions with Halogens</b>		
4	<b>Ester</b>	All esters contain the -COO- functional group.	13	<b>Reactions with Hydrogen</b>		
5	<b>Fermentation</b>	The reaction in which the enzymes in yeast turn glucose into ethanol and carbon dioxide.	14	<b>Reactions with Water (Steam)</b>	16	<b>Carboxylic Acids</b>
6	<b>Functional Group</b>	An atom or group of atoms that give organic compounds their characteristic reactions.			17	<b>Esters</b>
7	<b>Halogens</b>	The elements found in group 7 of the periodic table.				
8	<b>Homologous Series</b>	A group of related organic compounds that have the same functional group.				
9	<b>Hydrocarbon</b>	A compound containing only hydrogen and carbon.				

- Complete combustion occurs when there is excess oxygen so water and carbon dioxide form.
- Incomplete combustion occurs when there is insufficient oxygen to burn so a mixture of products can form e.g. carbon monoxide or carbon in the form of soot.
- Alkenes are less likely to combust completely, so they tend to burn in air with a smoky flame due to incomplete combustion.

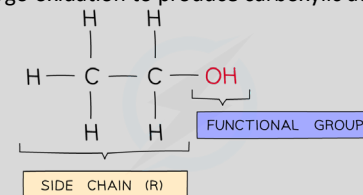
- Alkenes mainly undergo addition reactions in which atoms of a simple molecule add across the C=C double bond
- The carbon-carbon double bond opens up, forming a single bond between the carbons allowing for two more atoms to bond, one on each carbon.

- The halogens also participate in addition reactions with alkenes.
- The same process works for any halogen and any alkene in which the halogen atoms always add to the carbon atoms involved in the C=C double bond
- The reaction occurs readily at room temperature.

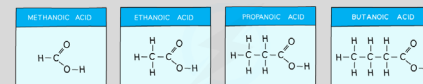
- Alkenes undergo addition reactions with hydrogen in which an alkane is formed
- These are hydrogenation reactions and occur at 150°C using a nickel catalyst
- Hydrogenation reactions are used to manufacture margarine from vegetable oils.

- Alkenes also undergo addition reactions with steam in which an alcohol is formed. Since water is being added to the molecule it is also called a hydration reaction
- The reaction is very important industrially for the production of alcohols and it occurs using the following conditions:
  - Temperature of around 330°C
  - Pressure of 60 – 70 atm
  - Concentrated phosphoric acid catalyst

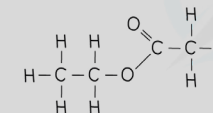
- All alcohols contain the hydroxyl (-OH) functional group which is the part of alcohol molecules that is responsible for their characteristic reactions
- Alcohols are a homologous series of compounds that have the general formula  $C_nH_{2n+1}OH$
- Alcohols are produced by fermentation.
- Alcohols undergo combustion to form carbon dioxide and water
- Alcohols react with sodium metal to produce hydrogen gas and a metal salt
- Alcohols undergo oxidation to produce carboxylic acids, an organic acid



- Carboxylic acids are a homologous series of compounds that have the general formula of  $C_nH_{2n+1}COOH$
- They differ by one  $-CH_2$  in the molecular formulae from one member to the next.
- The salts formed by the reaction of carboxylic acids all end -anoate
- Alcohols and carboxylic acids react to make esters in esterification reactions in the presence of an acid catalyst, usually concentrated sulfuric acid



- Esters are compounds with the functional group R-COO-R
- Esters are sweet smelling oily liquids used in food flavourings and perfumes
- They are volatile, meaning they vapourise easily
- Ethanoic acid will react with ethanol in the presence of concentrated sulfuric acid (catalyst) to form ethyl ethanoate:



# Year 11 Science Knowledge Organiser – Crude Oil and Fuels 2

Key Vocabulary:		
1	<b>Alkane</b>	Saturated hydrocarbon with the general formula $C_nH_{2n+2}$
2	<b>Alkene</b>	Unsaturated hydrocarbon, which contains a carbon-carbon double bond, with the general formula $C_nH_{2n}$
3	<b>Boiling Point</b>	The temperature at which a substance turns from a liquid to a gas.
4	<b>Combustion</b>	A reaction where a fuel is oxidised releasing heat energy.
5	<b>Cracking</b>	The reaction used in the oil industry to break down larger hydrocarbons into smaller, more useful ones.
6	<b>Crude Oil</b>	A mixture of hydrocarbons found in rock.
7	<b>Flammability</b>	How easily a fraction catches fire.
8	<b>Fractional Distillation</b>	A way to separate liquids from a mixture of liquids by boiling off the substances at different temperatures, then condensing and collecting the liquids.
9	<b>Hydrocarbon</b>	A compound containing only hydrogen and carbon.
10	<b>Incomplete Combustion</b>	When a fuel burns in insufficient oxygen, producing carbon monoxide as a toxic product.
11	<b>Particulate</b>	Small solid particle given off from motor vehicles as a result of incomplete combustion of its fuel
12	<b>Saturated Hydrocarbon</b>	Describes a hydrocarbon with only single bonds between its carbon atoms. This means that it contains as many carbon atoms as possible in each molecule.
13	<b>Viscosity</b>	The resistance of a liquid to flowing or pouring; a liquid's 'thickness'.

14	Types of Formulae
<b>General Formulae</b>	
This type of formula tells you the composition of any member of a whole homologous series of organic compound	
For example, all the alkanes have the general formula $C_nH_{2n+2}$	
This tells you that however many carbon atoms there are in the alkane, doubling this number and adding two will give you the number of hydrogen atoms present in the alkane.	
<b>Displayed Formulae</b>	
This shows the spatial arrangement of all the atoms and bonds in a molecule.	
<b>Molecular Formulae</b>	
This shows the actual number of each atom in a molecule, one molecule at a time.	
<b>Structural Formulae</b>	
This gives enough information to make the structure clear, but most of the actual covalent bonds are omitted	
15	Hydrocarbons and Crude Oil
<ul style="list-style-type: none"> <li>Crude oil is a finite resource found in rocks. It was formed over millions of years from the remains of ancient sea animals and plants.</li> <li>Crude oil that is formed is a dark, smelly liquid which is a mixture of many different carbon compounds.</li> <li>Most of the compounds in crude oil are hydrocarbons.</li> <li>Alkanes are saturated hydrocarbons meaning they contain as many hydrogen atoms as possible in their molecules.</li> </ul>	
16	Fractional Distillation

17	Fractional Distillation
<ul style="list-style-type: none"> <li>Crude oil is heated and enters at all column called a fractioning column. The column is hot at the bottom and decreases in temperature toward the top. As the crude oil is heated, it begins to evaporate and its vapours begin to</li> <li>rise up through the column. These vapours condense at the different fractions.</li> <li>Short-chain hydrocarbons are found at the top of the column. This is because shorter chain molecules are held together by weak intermolecular forces resulting in low boiling points. These shorter chain hydrocarbons leave the column as gas.</li> <li>Long-chain hydrocarbons are found at the bottom of the column and are held together by strong intermolecular forces, resulting in high boiling points.</li> </ul>	
18	Burning Hydrocarbon Fuels
<ul style="list-style-type: none"> <li>When hydrocarbon fuels are burned in plenty of air, the carbon and hydrogen in the fuel are completely oxidised. They produce carbon dioxide and water.</li> <li>For example, the simplest alkane, methane burns as follows:           <math display="block">CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O</math> </li> <li>Petrol is largely composed of isomers of octane, <math>C_8H_{18}</math>, which requires large amounts of oxygen to combust fully           <math display="block">2C_8H_{18} + 25O_2 \rightarrow 16CO_2 + 18H_2O</math> </li> <li>The efficiency of car engines does not usually enable all the petrol to burn, so car exhaust will contain small amounts of unburnt hydrocarbons as well as other products such as carbon monoxide and soot which lead to environmental problems.</li> </ul>	
19	Cracking Hydrocarbons
<ul style="list-style-type: none"> <li>Cracking is an example of a thermal decomposition reaction. Long-chain hydrocarbons can be broken down into shorter, more useful hydrocarbon chains.</li> <li>Cracking can be carried out with a catalyst in catalytic cracking or with steam in steam cracking.</li> <li>Catalytic cracking involves heating a hydrocarbon to a high temperature (550°C) and passing over a hot catalyst.</li> <li>Cracking of a long-chain hydrocarbon produces a short-chain alkane and an alkene.</li> <li>Alkenes are another type of hydrocarbon that is double bonded. The general formula for an alkene is <math>C_nH_{2n+2}</math></li> <li>Alkenes are unsaturated hydrocarbons. In a chemical reaction, the double bond of the alkenes can break. This allows other atoms to bond to it.</li> </ul>	



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1	<b>Alcohol</b>	A group of organic compounds that have the same functional group (-OH, hydroxyl group)	10	<b>Combustion of Alkenes</b>	15	<b>Alcohols</b>
2	<b>Alkene</b>	Unsaturated hydrocarbon, which contains a carbon-carbon double bond, with the general formula $C_nH_{2n}$	11	<b>Addition Reactions of Alkenes</b>		
3	<b>Carboxylic Acids</b>	All carboxylic acids contain the -COOH functional group.	12	<b>Reactions with Halogens</b>		
4	<b>Ester</b>	All esters contain the -COO- functional group.	13	<b>Reactions with Hydrogen</b>		
5	<b>Fermentation</b>	The reaction in which the enzymes in yeast turn glucose into ethanol and carbon dioxide.	14	<b>Reactions with Water (Steam)</b>	16	<b>Carboxylic Acids</b>
6	<b>Functional Group</b>	An atom or group of atoms that give organic compounds their characteristic reactions.			17	<b>Esters</b>
7	<b>Halogens</b>	The elements found in group 7 of the periodic table.				
8	<b>Homologous Series</b>	A group of related organic compounds that have the same functional group.				
9	<b>Hydrocarbon</b>	A compound containing only hydrogen and carbon.				

- Complete combustion occurs when there is excess oxygen so water and carbon dioxide form.
- Incomplete combustion occurs when there is insufficient oxygen to burn so a mixture of products can form e.g. carbon monoxide or carbon in the form of soot.
- Alkenes are less likely to combust completely, so they tend to burn in air with a smoky flame due to incomplete combustion.

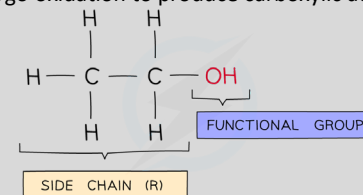
- Alkenes mainly undergo addition reactions in which atoms of a simple molecule add across the C=C double bond
- The carbon-carbon double bond opens up, forming a single bond between the carbons allowing for two more atoms to bond, one on each carbon.

- The halogens also participate in addition reactions with alkenes.
- The same process works for any halogen and any alkene in which the halogen atoms always add to the carbon atoms involved in the C=C double bond
- The reaction occurs readily at room temperature.

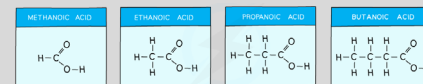
- Alkenes undergo addition reactions with hydrogen in which an alkane is formed
- These are hydrogenation reactions and occur at 150°C using a nickel catalyst
- Hydrogenation reactions are used to manufacture margarine from vegetable oils.

- Alkenes also undergo addition reactions with steam in which an alcohol is formed. Since water is being added to the molecule it is also called a hydration reaction
- The reaction is very important industrially for the production of alcohols and it occurs using the following conditions:
  - Temperature of around 330°C
  - Pressure of 60 – 70 atm
  - Concentrated phosphoric acid catalyst

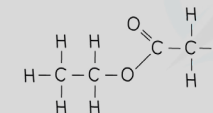
- All alcohols contain the hydroxyl (-OH) functional group which is the part of alcohol molecules that is responsible for their characteristic reactions
- Alcohols are a homologous series of compounds that have the general formula  $C_nH_{2n+1}OH$
- Alcohols are produced by fermentation.
- Alcohols undergo combustion to form carbon dioxide and water
- Alcohols react with sodium metal to produce hydrogen gas and a metal salt
- Alcohols undergo oxidation to produce carboxylic acids, an organic acid



- Carboxylic acids are a homologous series of compounds that have the general formula of  $C_nH_{2n+1}COOH$
- They differ by one  $-CH_2$  in the molecular formulae from one member to the next.
- The salts formed by the reaction of carboxylic acids all end -anoate
- Alcohols and carboxylic acids react to make esters in esterification reactions in the presence of an acid catalyst, usually concentrated sulfuric acid



- Esters are compounds with the functional group R-COO-R
- Esters are sweet smelling oily liquids used in food flavourings and perfumes
- They are volatile, meaning they vapourise easily
- Ethanoic acid will react with ethanol in the presence of concentrated sulfuric acid (catalyst) to form ethyl ethanoate:



# Year 11 Science Knowledge Organiser – Crude Oil and Fuels 2

Key Vocabulary:		
1	<b>Alkane</b>	Saturated hydrocarbon with the general formula $C_nH_{2n+2}$
2	<b>Alkene</b>	Unsaturated hydrocarbon, which contains a carbon-carbon double bond, with the general formula $C_nH_{2n}$
3	<b>Boiling Point</b>	The temperature at which a substance turns from a liquid to a gas.
4	<b>Combustion</b>	A reaction where a fuel is oxidised releasing heat energy.
5	<b>Cracking</b>	The reaction used in the oil industry to break down larger hydrocarbons into smaller, more useful ones.
6	<b>Crude Oil</b>	A mixture of hydrocarbons found in rock.
7	<b>Flammability</b>	How easily a fraction catches fire.
8	<b>Fractional Distillation</b>	A way to separate liquids from a mixture of liquids by boiling off the substances at different temperatures, then condensing and collecting the liquids.
9	<b>Hydrocarbon</b>	A compound containing only hydrogen and carbon.
10	<b>Incomplete Combustion</b>	When a fuel burns in insufficient oxygen, producing carbon monoxide as a toxic product.
11	<b>Particulate</b>	Small solid particle given off from motor vehicles as a result of incomplete combustion of its fuel
12	<b>Saturated Hydrocarbon</b>	Describes a hydrocarbon with only single bonds between its carbon atoms. This means that it contains as many carbon atoms as possible in each molecule.
13	<b>Viscosity</b>	The resistance of a liquid to flowing or pouring; a liquid's 'thickness'.

14	Types of Formulae
<b>General Formulae</b>	
This type of formula tells you the composition of any member of a whole homologous series of organic compound	
For example, all the alkanes have the general formula $C_nH_{2n+2}$	
This tells you that however many carbon atoms there are in the alkane, doubling this number and adding two will give you the number of hydrogen atoms present in the alkane.	
<b>Displayed Formulae</b>	
This shows the spatial arrangement of all the atoms and bonds in a molecule.	
<b>Molecular Formulae</b>	
This shows the actual number of each atom in a molecule, one molecule at a time.	
<b>Structural Formulae</b>	
This gives enough information to make the structure clear, but most of the actual covalent bonds are omitted	
15	Hydrocarbons and Crude Oil
<ul style="list-style-type: none"> <li>Crude oil is a finite resource found in rocks. It was formed over millions of years from the remains of ancient sea animals and plants.</li> <li>Crude oil that is formed is a dark, smelly liquid which is a mixture of many different carbon compounds.</li> <li>Most of the compounds in crude oil are hydrocarbons.</li> <li>Alkanes are saturated hydrocarbons meaning they contain as many hydrogen atoms as possible in their molecules.</li> </ul>	
16	Fractional Distillation

17	Fractional Distillation
<ul style="list-style-type: none"> <li>Crude oil is heated and enters at all column called a fractioning column. The column is hot at the bottom and decreases in temperature toward the top. As the crude oil is heated, it begins to evaporate and its vapours begin to</li> <li>rise up through the column. These vapours condense at the different fractions.</li> <li>Short-chain hydrocarbons are found at the top of the column. This is because shorter chain molecules are held together by weak intermolecular forces resulting in low boiling points. These shorter chain hydrocarbons leave the column as gas.</li> <li>Long-chain hydrocarbons are found at the bottom of the column and are held together by strong intermolecular forces, resulting in high boiling points.</li> </ul>	
18	Burning Hydrocarbon Fuels
<ul style="list-style-type: none"> <li>When hydrocarbon fuels are burned in plenty of air, the carbon and hydrogen in the fuel are completely oxidised. They produce carbon dioxide and water.</li> <li>For example, the simplest alkane, methane burns as follows:                     <math display="block">CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O</math> </li> <li>Petrol is largely composed of isomers of octane, <math>C_8H_{18}</math>, which requires large amounts of oxygen to combust fully                     <math display="block">2C_8H_{18} + 25O_2 \rightarrow 16CO_2 + 18H_2O</math> </li> <li>The efficiency of car engines does not usually enable all the petrol to burn, so car exhaust will contain small amounts of unburnt hydrocarbons as well as other products such as carbon monoxide and soot which lead to environmental problems.</li> </ul>	
19	Cracking Hydrocarbons
<ul style="list-style-type: none"> <li>Cracking is an example of a thermal decomposition reaction. Long-chain hydrocarbons can be broken down into shorter, more useful hydrocarbon chains.</li> <li>Cracking can be carried out with a catalyst in catalytic cracking or with steam in steam cracking.</li> <li>Catalytic cracking involves heating a hydrocarbon to a high temperature (550°C) and passing over a hot catalyst.</li> <li>Cracking of a long-chain hydrocarbon produces a short-chain alkane and an alkene.</li> <li>Alkenes are another type of hydrocarbon that is double bonded. The general formula for an alkene is <math>C_nH_{2n+2}</math></li> <li>Alkenes are unsaturated hydrocarbons. In a chemical reaction, the double bond of the alkenes can break. This allows other atoms to bond to it.</li> </ul>	

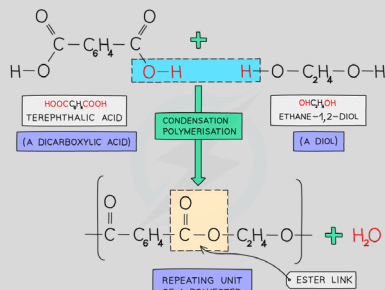
# Year 11 Science Knowledge Organiser – Polymers (TRIPLE ONLY)

Key Vocabulary:		
1	<b>Additional Polymerisation</b>	Chemical reaction in which unsaturated monomers (small molecules) join by addition reactions to produce a polymer (long molecule).
2	<b>Condensation Polymerisation</b>	Chemical reaction in which monomers (small molecules) join to produce a polymer and a small molecule such as water.
3	<b>Dicarboxylic Acid</b>	A carboxylic acid with a $-COOH$ group at either end
4	<b>Diol</b>	An alcohol with an $-OH$ group at either end
5	<b>DNA</b>	Deoxyribonucleic acid. The material inside the nucleus of cells, carrying the genetic information of a living being.
6	<b>Monomer</b>	Small, reactive molecules that react together in repeating sequences to form a very large molecule (a polymer)
7	<b>Mono-saccharides</b>	Simple carbohydrates (sugars) such as fructose and glucose.
8	<b>Natural Polymers</b>	A polymer that is naturally occurring e.g., starch, haemoglobin
9	<b>Polymer</b>	A substance made from very large molecules made up of many repeating units.
10	<b>Polysaccharides</b>	Complex carbohydrates such as starch and cellulose
11	<b>Polypeptides</b>	Condensation polymers which are formed from amino acid monomers joined together by a peptide link
12	<b>Synthetic Polymers</b>	A polymer that is manufactured e.g., nylon, polystyrene

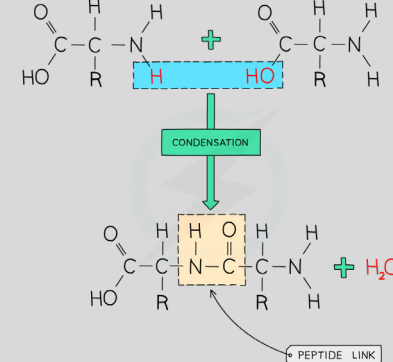
13	Polymerisation
	<ul style="list-style-type: none"> <li>Polymers are large molecules of high relative molecular mass and are made by linking together large numbers of smaller molecules called monomers</li> <li>Each monomer is a repeat unit and is connected to the adjacent units via covalent bonds</li> <li>Polymerisation reactions usually require high pressures and the use of a catalyst</li> <li>Many everyday materials such as resins, plastics, polystyrene cups, nylon etc. are polymers</li> </ul>

14	Representing Polymers and Monomers
	<p>MONOMER <math>n</math> <math>\xrightarrow{\text{POLYMERISATION}}</math> REPEAT UNIT <math>n</math></p> <p>ETHENE <math>n</math> <math>\xrightarrow{\quad}</math> POLY(ETHENE) <math>n</math></p>

15	Condensation Polymerisation (HIGHER ONLY)
	<ul style="list-style-type: none"> <li>Condensation polymers are formed when two different monomers are linked together with the removal of a small molecule, usually water.</li> <li>The monomers have two functional groups present, one on each end.</li> <li>The functional groups at the ends of one monomer react with the functional group on the end of the other monomer, in so doing creating long chains of alternating monomers, forming the polymer</li> </ul>



16	Amino Acids (HIGHER ONLY)
	<ul style="list-style-type: none"> <li>Amino acids are small molecules containing the amino, <math>NH_2</math>, and carboxylic acid, <math>COOH</math>, functional groups</li> <li>The <math>NH_2</math> group is basic and behaves in a similar way to ammonia</li> <li>The <math>COOH</math> group is acidic and is called a carboxyl group</li> <li>There are twenty naturally occurring amino acids and they all have the same general structure</li> <li>In polypeptides the amino group on one amino acid links to the acid group of an adjacent amino acid</li> </ul>

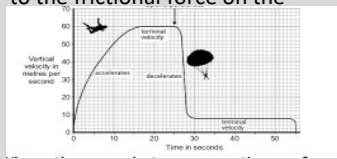


17	DNA and Natural Polymers (HIGHER ONLY)
	<ul style="list-style-type: none"> <li>DNA consists of four different monomers called nucleotides which contain small molecules called bases and which are abbreviated to A, T, C, and G which are bound together by polymerisation</li> </ul>
	<b>Starch &amp; Cellulose</b>
	<ul style="list-style-type: none"> <li>Carbohydrates are compounds of carbon, hydrogen and oxygen with the general formula <math>C_x(H_2O)_y</math>. There are simple carbohydrates and complex carbohydrates</li> <li>The monomers from which starch and cellulose are made are both sugars</li> <li>Starch is used to store energy and cellulose is a stiff polymer used in plant cell walls to provide support</li> <li>Complex carbohydrates are condensation polymers formed from simple sugar monomers and, unlike proteins, are usually made up of the same monomers</li> <li>An <math>H_2O</math> molecule is eliminated when simple sugars polymerise</li> </ul>

# Year Science Term Knowledge Organiser. Forces in motion. Triple 1

## Key Vocabulary:

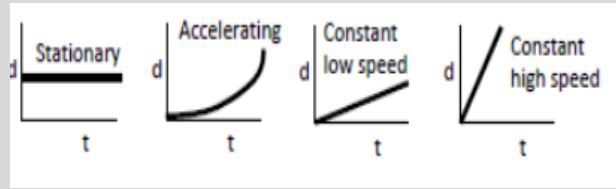
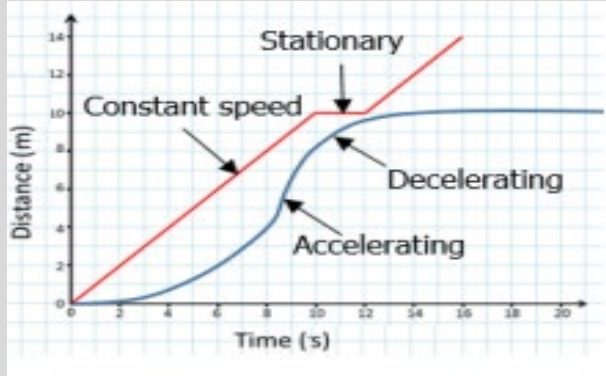
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2	Deceleration.	Slowing down or negative acceleration, eg the car slowed down with a deceleration of 2 ms <sup>-2</sup> .
3	Displacement.	Slowing down or negative acceleration, eg the car slowed down with a deceleration of 2 ms <sup>-2</sup> .
4	Scalar	A quantity that requires only a size, for example, distance travelled is 20 m.
5	Momentum	A moving object with mass has momentum. Momentum is "mass in motion" It is a vector quantity. Momentum = mass x velocity
6	Vector.	A physical quantity that has both magnitude (size) and direction. Eg force, velocity, displacement, acceleration
7	Velocity.	The speed of an object in a particular direction.
8	Weight	The weight of an object is the force acting on the object due to gravity. Measured in newtons, N weight = mass x gravitational field strength. $w = m \times g$ .
9	Mass	The quantity of matter in it. Measured in Kg.
10	Terminal velocity	The velocity an object eventually reaches when it is falling. The weight of the object is then equal to the frictional force on the



## 11 Speed, distance, time.

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**Calculations involving speed, distance and time**  
 The distance travelled by an object moving at constant speed can be calculated using the equation:  
 distance travelled = speed × time  
 This is when:  
 distance travelled (s) is measured in metres (m)  
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The movement of objects can be described using motion graphs and numerical values. These are both used to help in the design of faster and more efficient vehicles.

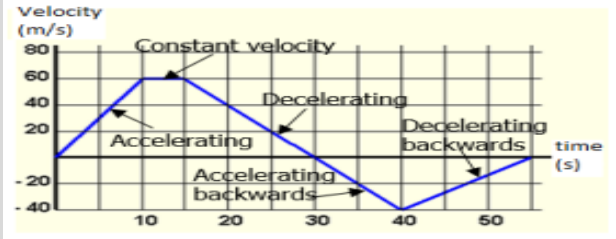


## 12 Stopping distance

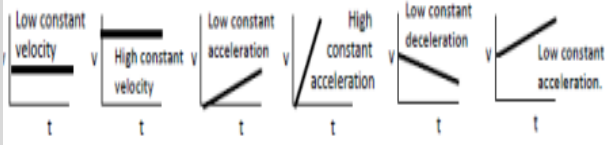
The sum of the thinking distance and braking distance.

## 13 Velocity-time graph

If an object moves along a straight line, its motion can be represented by a velocity-time graph. The gradient of the line is equal to the **acceleration** of the object

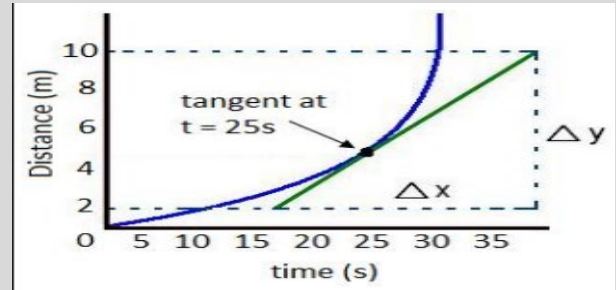


Velocity-time graph



## 14 Calculating the gradient

The distance-time graph for an object moving at changing speed is a curve. To find the speed at a particular instant in time, draw a tangent to the line at that instant and determine the gradient of the tangent.



Calculating the gradient:

$$\text{slope} = \frac{\Delta y}{\Delta x}$$

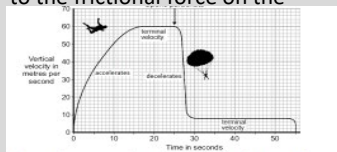
or

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# Year Science Term Knowledge Organiser. Forces in motion. Triple 1

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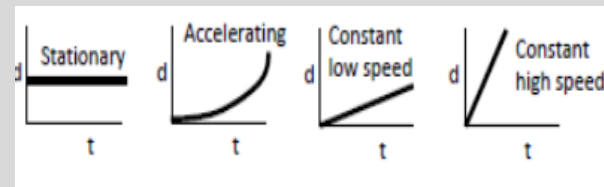
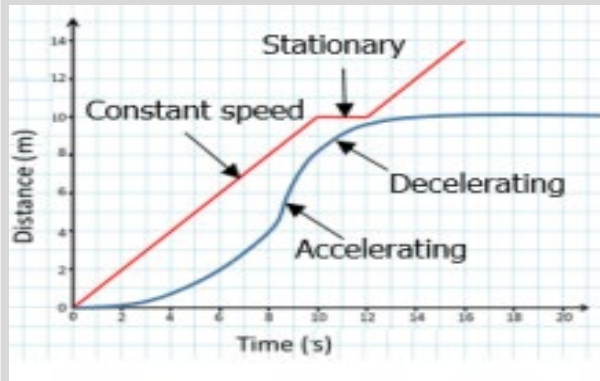
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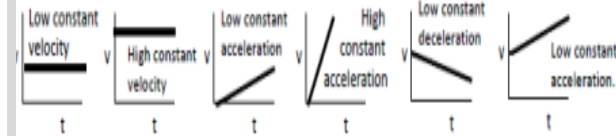
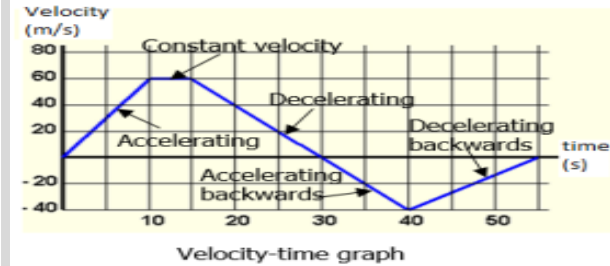


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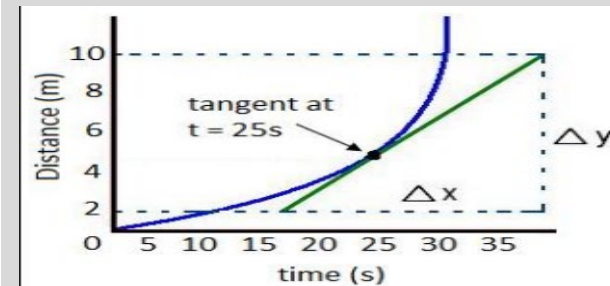
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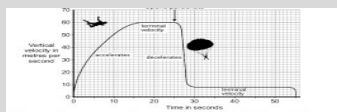
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# Year Science Term Knowledge Organiser. Forces in motion. Triple Science (Part 2.)

## Key Vocabulary:

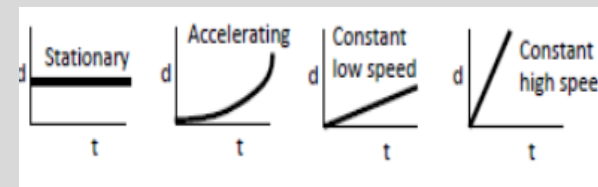
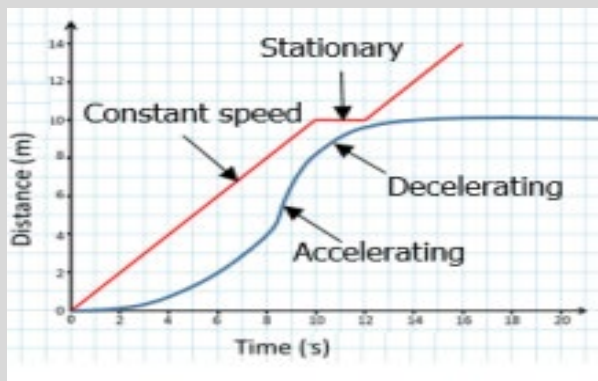
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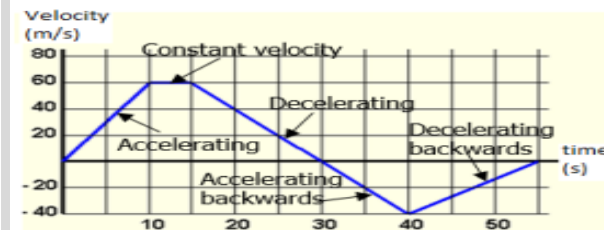


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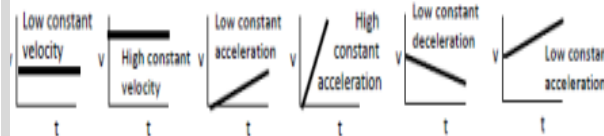
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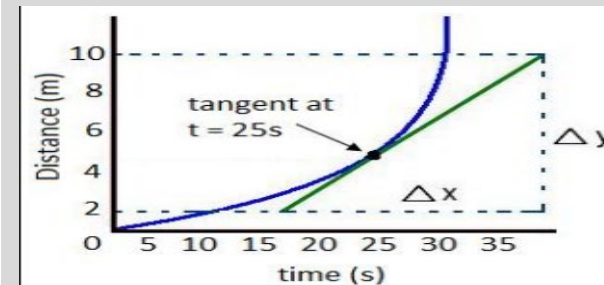


Velocity-time graph



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# Year Science Knowledge Organiser . Forces and motion Triple( part 3)

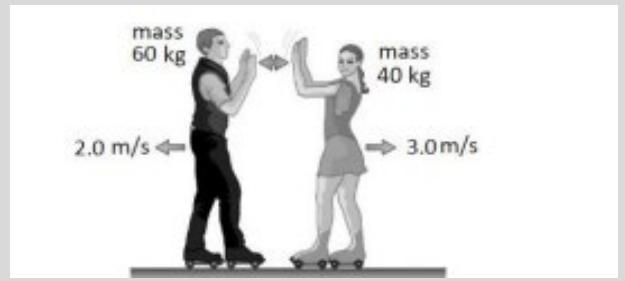
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Terminal velocity	The velocity an object eventually reaches when it is falling. The weight of the object is then equal to the frictional force on the object

## 11 Using conservation of momentum

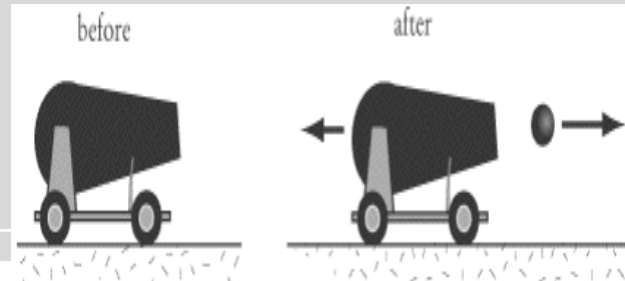
When two objects push each other apart, they move with different speeds if they have unequal masses and with equal and opposite momentum, so their total momentum is zero. This means that the momentum lost by one of the objects will be gained by the other object. Hence whenever two objects collide or interact, momentum is conserved.  
Momentum = mass x velocity  $p = m \times v$

Two roller skaters, a girl and a boy stand facing each other on flat level ground. When one of the roller skaters pushes the other one away, they move away in opposite directions at different velocities because they have different masses



Momentum of boy =  $60 \times 2 = 120 \text{ Kg m/s}$   
Momentum of girl =  $-40 \times 3 = -120 \text{ Kg m/s}$   
Total momentum =  $120 - 120 = 0 \text{ Kg m/s}$   
The minus sign tells you that the momentum of the girl is in the opposite direction to the momentum of the boy.

**Explosions**  
Total momentum after an explosion is the same as before the explosion. The total momentum after the explosion is zero.  
Momentum before = Momentum after



## 12 Impact forces

When two vehicles collide, the force of the impact depends on the mass, change of velocity and length of the impact time.  

- They exert equal and opposite forces on each other
- Their total momentum is unchanged.

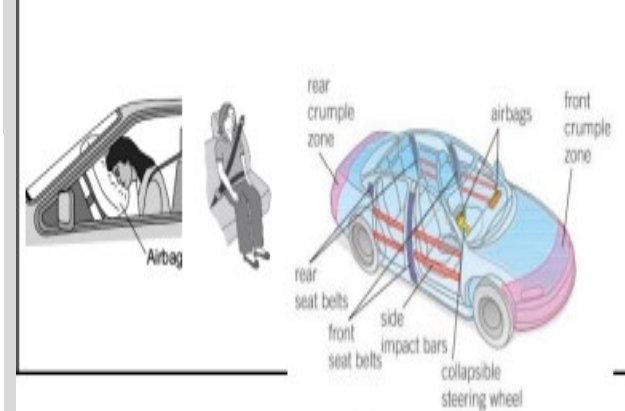
**Longer the impact time, the more the impact force is reduced.**

Impact force = $\frac{\text{change in momentum}}{\text{time taken}}$ $F = \frac{m\Delta v}{\Delta t}$		
Force	F	Newtons, N
$m\Delta v$	Change in momentum	Kg m/s
$\Delta t$	Time taken	s

## 13 Car safety

When you are driving in a car or riding a bike you want to feel safe if you crash. Different safety features have been designed to increase the impact time and hence decrease the rate of change in momentum

**Reduce impact forces by increasing impact time.**  
**Seat belts & air bags**  
Spread force across chest and increase impact time. Hence reduces impact force on head.

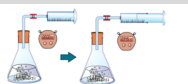
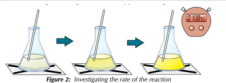
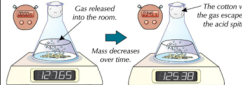


# Year 11 Science Knowledge Organiser Spring Term – Rates and Equilibrium

Key Vocabulary:		
1	<b>Activation Energy</b>	The minimum energy needed for a reaction to take place.
2	<b>Catalyst</b>	A substance that speeds up a chemical reaction by providing a different pathway for the reaction that has a lower activation energy, the catalysts is chemically unchanged at the end of the reaction.
3	<b>Collision Theory</b>	An explanation of chemical reactions in terms of reacting particles colliding with sufficient energy for a reaction to take place.
4	<b>Equilibrium</b>	The point in a reversible reaction at which the forward and backward rates of reaction are the same. Therefore, the amounts of substance present in the reacting mixture remain constant.
5	<b>Le Châtelier's Principle</b>	When a change in conditions is introduced to a system at equilibrium, the position of the equilibrium shifts so as to cancel out the change.
6	<b>Rate of Reaction</b>	can be measured either by how fast a reactant is used up or by how fast the product is made.
7	<b>Rate of Reaction Calculation</b>	$= \frac{\text{mass of reactant used or product formed}}{\text{Time taken}}$
8	<b>Reversible Reaction</b>	A reaction in which the products can re-form the reactants.

**9 Rates of Reaction**

- The rate of a chemical reaction tells you how fast reactants turn into products.
- There are three ways that the rate of reaction can be measured:

Volume of gas produced	
Formation of a solid product	
Change in mass	

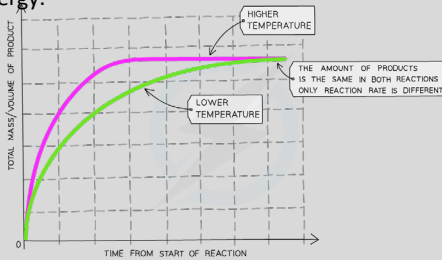
*Figure 20: Investigating the rate of the reaction between sodium thiosulfate and hydrochloric acid.*

**10 Collision Theory and Surface Area**

- Reactions can only take place when particles (atoms, ions or molecules) of reactants come together.
- The reacting particles do not only have to bump into each other, but also need to collide with enough energy to cause a reaction to take place.
- Reactions are more likely to happen between the reactant particles if you :
  - Increase the frequency of reaction particles colliding with each other
  - Increasing the energy they have when they collide.
- The larger the surface area of the reactants, the faster the rate of reaction as the frequency of collisions between reacting particles.

**11 The Effect of Temperature**

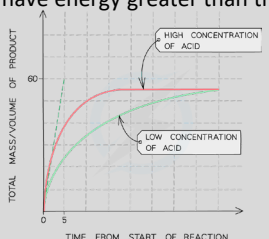
- Increasing the temperature increased the rate of reaction because the particles can collide more frequently and energetically meaning more of the collisions occurring in a given time results in a reaction because a higher proportion of particles have energy greater than the activation energy.



THE AMOUNT OF PRODUCTS IS THE SAME IN BOTH REACTIONS ONLY REACTION RATE IS DIFFERENT.

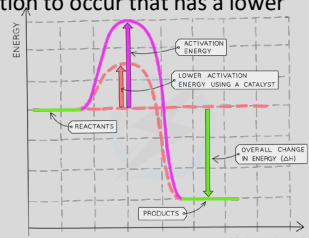
**12 The Effect of Concentration/Pressure**

- Increasing the concentration/pressure increases the rate of reaction because the particles can collide more frequently and energetically meaning more of the collisions occurring in a given time results in a reaction because a higher proportion of particles have energy greater than the activation energy.



**13 The Effect of Catalysts**

- Catalysts are substances which speed up the rate of a reaction without themselves being altered or consumed in the reaction.
- Different processes require different types of catalysts, but they all work on the same principle of providing a different pathway for the reaction to occur that has a lower activation energy.



**14 Energy and Reversible Reactions**

- In reversible reactions, one reaction is exothermic, and one reaction is endothermic.
- In any reversible reaction, the amount of energy transferred to the surrounds when the reaction goes in one direction is exactly equal to the energy transferred back when the reaction goes in the opposite direction

**15 Altering Conditions (HIGHER ONLY)**

- Pressure can affect reversible reactions involving gases at equilibrium. Increasing the pressure favours the reaction that forms fewer molecules of gas.
- You can change the relative amount of products formed at equilibrium, by changing the temperature at which you carry out a reversible reaction.
- Increasing the temperature favours the endothermic reaction and decreasing the temperature favours the exothermic reaction.



# Year 11 Art and Design Autumn Term Knowledge Organiser

## Key Vocabulary:

<b>1</b>	<b>The Formal Elements of Art</b>	The formal elements of art are used to make a piece of artwork. These elements are line, tone, colour, pattern, texture, shape, form and space. They are often used together, and how they are organised in a piece of art determines what the finished piece will look like.
<b>2</b>	<b>mark</b>	Mark making describes the different lines, dots, marks, patterns and textures created to produce a work of art. Artists often use mark making and gestural qualities to express their feeling and emotions in response to something seen or something felt.
<b>3</b>	<b>Visual Principles</b>	Rules for using the elements. For example, harmony, balance, scale and proportion, contrast, rhythm and motion, composition.
<b>4</b>	<b>Visual Language</b>	This is made up from the visual (or basic) elements and principles (or rules).
<b>5</b>	<b>Universal Themes in Art</b>	The subject matter that artists use for their work. For example, the following categories for themes that occur throughout the world of art, craft and design. <ul style="list-style-type: none"> <li>• Human experience</li> <li>• The environment</li> <li>• Animals and plants Events</li> <li>• Fantastic and strange</li> <li>• Abstraction</li> </ul>
<b>6</b>	<b>harmony</b>	In art and design harmony means making sure the elements you use 'accord' with each other.
<b>7</b>	<b>balance</b>	If a picture or piece of artwork has balance, then each part of it works well together in a whole piece.

<b>8</b>	<b>scale and proportion</b>	The scale of something is its size. To scale something is to enlarge it. To scale down is to do a smaller version or reduction. The size of the work and the elements in it.
<b>9</b>	<b>contrast</b>	Giving some elements more impact than others.
<b>10</b>	<b>composition</b>	The arrangement of elements in a piece of art.
<b>11</b>	<b>moodboard</b>	Imagery collected relevant to a theme. It can be a range of different ideas, not just one. It displays your ideas at the start of a journey. For example, internet imagery, magazine cuttings and photography can be used together.
<b>12</b>	<b>(AOs)</b>	GCSE Art and Design assessment objectives. There are <b>four</b> assessment objectives. AO1, AO2, AO3 and AO4.
<b>13</b>	<b>Artist Research</b>	Showing your understanding of artworks and styles. For example, how they have influenced the work of others and personal ideas.
<b>14</b>	<b>Artist Response</b>	Showing your understanding of artworks and styles and how they have influenced personal ideas.
<b>15</b>	<b>Critical Understanding</b>	Showing an ability to analyse the work of others. Engaging with ideas, images and identifying how values and meanings are conveyed. Looking at content, form, process and mood when discussing 2D and 3D work.

# Year 11 DT Knowledge Organiser Non-Exam Assessment

## Key Vocabulary:

1	Contextual Challenges	All design and technology happens within a context. It is important for designers to understand the context they are designing within, as this will impact on the wants and needs of users as well as the requirements for the design.
2	Investigation of Needs and Research	Identify the need of the end user. Outline a design problem from the context provided and identify a need for a product that could solve the problem.
3	Exploration of Context and Research	The context of a study is important because it helps to clarify the meaning and relevance of the research, and can provide insight into the ways in which the findings might be applied in practice.
4	Market Research. Primary Research & Results	The term market research refers to the process of evaluating the viability of a new product through research conducted directly with potential customers.
5	Product Analysis	Investigate existing products to inform the product specification for the prototype, from past and present designers.
6	Design Brief and Specification	Production of a design brief, that address all needs previously identified. Production of a product specification that includes statement that are technical, measurable and justifiable.

## Key Concepts

### 7. Design ideas

**Communication of design ideas** consider how designers develop, communicate, record and justify design ideas using a range of appropriate techniques such as: freehand sketching, schematic drawings, annotated drawings, exploded diagrams, working drawings, computer modelling and physical modelling.

**Prototype development** develop a knowledge and understanding of how the development of prototypes satisfy the requirements of the brief, respond to clients wants and needs, demonstrate innovation, functional and consider aesthetics.

**Material management** develop a knowledge and understanding of how to cut materials and minimize waste, the importance of planning the cutting and shaping of materials, how additional material may be removed by cutting methods, using appropriate marking out methods, data points and co-ordinates, quality assurance and quality control systems.

### 8. CAD/CAM

**CAD (Computer Aided Design)** is the use of a computer to help you visualise the product. CAD allows us to change the design quickly and allows the design to shared easily via email etc. Multiple people can be working on the same design and the same time making the process very efficient.

**CAM (Computer Aided Manufacturing)** It is important to remember that CAD can happen on its own because its just a design, but for CAM to occur, CAD must be involved. CAM is when machines (such as the laser cutter) produces the work that you have created using CAD. The process is to send your CAD design to the CAM machine, and with a few simple instructions the CAM machine will make the product or part.

### 9. Evaluation

The evaluation of your product often is left to the end, but you should evaluate your product at every stage in order to make alterations and corrections as you go.

It is useful to use a structure when evaluation such as a **SWOT analysis**. Using a SWOT analysis tool allows you to check all the main aspects of your product have been considered. A good evaluation DOES NOT only focus on the good parts of your product, but makes honest judgements that all you to make improvements next time, or as you go.

SWOT Evaluation Method



# Year 11 Language Paper 2 Knowledge Organiser

## Key Vocabulary:

1	Structure	The way a text is laid out on the page through the use of paragraphs, sentences and punctuation.
2	Evaluate	To make an informed judgement about a text and assess how well a writer does something.
3	Analyse	To examine something in detail then assess and interpret it.
4	Identify	To locate specific and relevant information.
5	Synthesise	Combining different ideas.
6	Explicit	Something clear and in detail. Leaving no room for interpretation.
7	Implicit	What is suggested by something but not directly made clear.

## 8. Questions 1 and 2

Reading and comprehension – 3 marks  
Read the question carefully.  
No need for an explanation. Keep quotes short and concise.

## 9. Question 3

Analysis of language and structure – 15 marks )

Language devices (Hyperbole, onomatopoeia, personification, alliteration, simile, triple emphasis, every sense, adjectives, metaphor, verb, adverb, noun, pathetic fallacy, pronouns)  
Structural devices (Dash, semi-colon, colon, list sentence, imperative sentence, interrogative sentence, short sentence, juxtaposition, tone, repetition, foreshadowing)

## 10. Questions 4 and 5

Reading and comprehension – 2 marks

Read the question carefully.

No need for an explanation. Keep quotes short and concise.

## 11. Question 6

Evaluation – 15 marks (no more than 30 minutes)

Split the extract into 3 – beginning middle and end.

At least 3 paragraphs examining a point from each section of the extract. If time examine more than one point from each section of the extract.

Remember: SCITE Focus on: settings, characters, ideas, themes and events.

## 12. Question 7

Part a – 6 marks. Three distinct similarities supported with evidence from both texts

Part B – 14 marks. Develop your response from 7.a commenting on the writer's use of language and/or structure. Also include at least one difference.

## 13. Question 8 and 9

Transactional writing – 40 marks (45 minutes)

This could be a speech, article, review, guide book or letter.

Use high level vocabulary and multiple language techniques. Discuss your opinion and also give an opposite opinion.

You must use paragraphs and correct punctuation (capital letter, ?, !, "").

# Year 11 Macbeth Knowledge Organiser

## Key Vocabulary:

1	Subvert	To undermine the power and authority of another
2	Paradoxical Language	A contradictory statement.
3	Soliloquy	A character says their thoughts aloud.
4	Hamartia	Fatal flaw, leading to the downfall of a tragic hero.
5	Duplicitous	Deceitful; appearing on way but acting another.
6	Tyrannical/ Tyrant	using, showing, or relating to the unfair and cruel use of power over other people
7	Valiant	possessing or showing courage or determination
8	Regicide	Act of killing a king
9	Foil	a character who contrasts with another character,

## 10. Context:

A	Divine Right of Kings	Kings are chosen by God and are their representative on earth.
b	Great Chain of Being	Hierarchal structure for all matter of life.
c	Supernatural	People where highly suspicious of the supernatural and witches.
d	Jacobean Times and James I	King James was on the throne and was a victim of an attempted assassination which inspired the events in the play.

## 11. Key quotations:

Banquo	Macbeth
<b>'The instruments of darkness tell us truths'</b>	<b>'Stars, hide your fires. Let not light see my black and deep desires'</b>
Lady Macbeth	Macbeth
<b>'look like the innocent flower but be the serpent underneath'</b>	<b>'Is this a dagger I see before me? Come let me clutch thee'</b>
Macbeth	Macbeth end of play
<b>'Oh full of scorpions is my mind'</b>	<b>'Out, out, brief candle!'</b>

## 13. Plot Summary



## 12. Key Characters:

a. Macbeth – **Valiant, Corrupt, Ambitious, Flawed, Indecisive, Conflicted, Tyrannical**. *Kills King Duncan and becomes King.*

b. Lady Macbeth – **Manipulative, Dominant, Emasculating, Duplicitous**. *Helps persuade Macbeth to kill Duncan through coercion.*

c. King Duncan – **Honourable, Kind, Respected, Ignorant**. *Is murdered by Macbeth.*

d. Macduff – **Virtuous, Passionate, Reckless, Honourable, Loyal**. *Kills Macbeth at the end of the play.*

e. Banquo – **Honourable, Loyal, Trustworthy Antithesis and foil of Macbeth** – *is murdered by Macbeth due to Macbeth jealousy and paranoia. Is told by the witches his descendants will become kings.*

f. Three Witches – **Supernatural, Cunning, Prophecies, Manipulative**. *Meeting with Macbeth and Banquo to offer three prophecies which lead to the tragic chain of events in the play.*

g. Malcolm – **Nobel, Cautious, Virtuous, Rightful King**. Malcolm is Duncan's son and heir to the throne. He initially runs away to England after his father dies but returns with an army to kill Macbeth.

h. Donalbain – The other son of Duncan who flees when he hears of his father's death.

i. Fleance – Banquo's son who survives the attempted murder.

j. Lady Macduff – Macduff's wife who is killed whilst Macduff is visiting Malcolm in England. The death of her and her son is fuel for Macduff to persuade Malcolm to bring his army to Scotland to kill Macbeth.

# Y11 Knowledge Organiser Enterprise R069

## Business Scenario – R068

Class Designs is a small business producing t-shirts. The business has been trading as a partnership for three years and is run by two partners. It produces and sells the t-shirts from a unit on a local business park. The business uses word-of-mouth and social media advertising to promote the t-shirts.

Class Designs is currently selling to customers in the local area only. The partners would like to increase brand awareness and sell the t-shirts nationwide. To grow the business a new website has been created that will accept online orders.

To help support the launch of the new website, Class Designs want to create a new range of t-shirt designs that they can sell on their new website. You have been asked to carry out market research to see what t-shirt designs customers would like. Using this information, they would like you to create a new t-shirt design.

### 1. Branding

A brand is an identity for a product and/or business. Brands help build a personality for a product or business; some brands are perceived as value for money, for example. Other brand personalities include being durable, luxurious, sporty or exciting

A brand can be created through a brand name, logo, sound (or jingle), strapline, characters or celebrity endorsement and brands often use a combination of these branding methods.

### 2. Brand Identity

In addition to a brand name and logo, the colour scheme a business uses, the font style they use and the placement of their logo can all help build their brand identity. Ask anyone to name a 'green colour supermarket brand' for example!

### 3. Why is branding used?

- A. Trust** – people often trust products that are branded compared to non-branded items.
- B. Brand recognition** – having a brand name and logo helps people recognise a product and/or business.
- C. Product image** – the perception of a product and/or business is often a result of branding.
- D. Differentiation** – having a brand can support a business's aim to be different to what's already on the market (it could convey this message through a strapline, for example).
- E. Adding value** – branded products are often priced higher than non-branded products.
- F. Customer loyalty** – it is often the case that people repeatedly buy the same brand of product, with branding helping to secure repeat purchases.

### 4. Competitor Analysis

When launching a new product, a business often looks at their competitors to find out what is already available on the market. Businesses look at their competitors' strengths, weaknesses, unique selling points and how their product idea is different to what brands already exist.

### 5. The External Environment

When developing new products, businesses often look at opportunities and threats that exist outside of the business itself (externally).

<b>6. Economic</b> Factors relating to the economy such as inflation and unemployment.	<b>7. Social</b> Trends in fashion, changes in taste and changing buying habits.
<b>8. Technological</b> Changes and advances in technology which can affect new product development.	<b>9. Ethical</b> The morals and values people have including environmental factors.

### 10. Promotional Objectives

A promotional campaign is a series of activities a business plans to help promote a product. The reason the business carries out a promotional campaign is known as their promotional objectives.

Promotional objectives could be:

- A. To raise awareness of a product or service
- B. To differentiate
- C. To create market presence
- D. To increase market share

### 11. Promotional Campaigns

The material used as part of a promotional campaign (such as a poster) must be appropriate for the product and the target customer profile.

A successful promotional campaign needs planning in advance with a clear timeframe for the whole campaign and each activity within the campaign. Promotional campaigns also need to be reviewed so, beforehand, a business will identify what they think will be the outcomes if the campaign is to be considered a success; these are known as key performance indicators (KPIs).

## Business Scenario – R069

Pitching your product proposal

You are a product designer and you have carried out market research to create a new product design which you want to bring to market.

You are now ready to develop a brand for your product, make recommendations as to how to promote it, and prepare a pitch to show an audience that your product proposal will be successful if introduced to the market.

Your pitch will include:

- Your product design.
- Your brand personality.
- Your pricing recommendation.
- Your proposed promotional campaign.
- Any other relevant information from your findings in R068.

### 12. Professional Pitches

A professional pitch is a presentation of

a new product or service to an audience, similar to those you see on Dragon's Den. When someone prepares a professional pitch, they consider a number of factors beforehand:

#### The objectives

The objectives of the pitch are to inform the audience or to persuade the audience. This influences the presenter's style and language used.

#### The audience

The presenter needs to be aware of who they are pitching their ideas to, tailoring the content and style of pitch to match.

#### The venue

A suitable venue needs to be selected based on size, layout and equipment.

#### Media/materials

The type of media (such as a presentation) used will be considered beforehand.

#### Personal Appearance

The presenter needs to consider their appearance and ensure it suits the style of pitch being delivered (formal).

#### Pitch Structure

Considering the order in which the pitch will be presented is an important factor;

starting with an introduction, ending with a conclusion and with logically sequenced information.

#### Use of Visual Aids

Including presentations and video clips.

#### Audience Questions

Presenters often plan answers to audience questions before their pitch.

# Unit 1B – Global Ecosystems

## Tundra

Found at high latitudes in Northern Europe, Canada and Alaska. Winters are very cold, summers are brief and there is little rainfall. There are hardly any trees – vegetation includes mosses, grasses and low shrubs. There is a layer of permanently frozen ground called permafrost.

## Polar

Found around the north and south poles. They are very cold, icy and dry. Not much grows at all. They remain in dark for several months each year so the growing season is very short – about two months.

## Grassland

There are two types of grassland. Savannah grasslands are found between the tropics. There are distinct dry and wet seasons, although rainfall is still relatively low. Most of the vegetation is grasses with a few scattered trees. Temperate grasslands are found at higher latitudes where there is more variation in temperature and less rainfall. There are no trees here – just grasses.

## Boreal Forest

Also known as taiga. Found between 50-60°N. Winters are cold and dry, summers are mild and moist. Trees are coniferous – they are evergreen and have needles.

## Tropical Rainforest

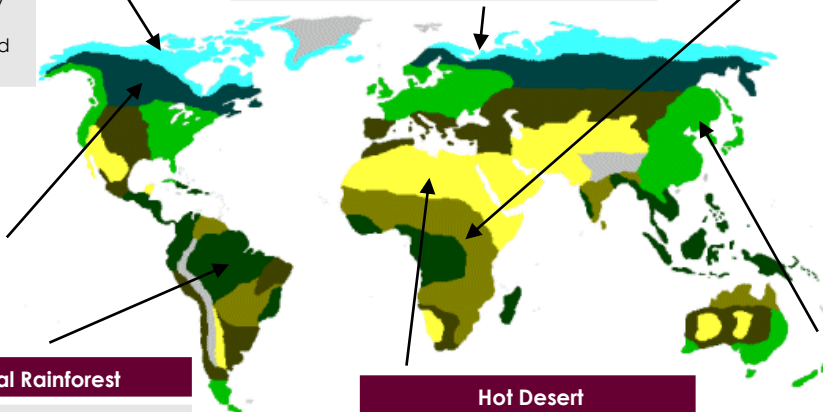
Found around the equator, between the tropics, where it's hot and wet all year round. This is an area of lush forest, with dense canopies of vegetation forming distinct layers.

## Hot Desert

Found between 15° and 35° north and south of the equator where there is little rainfall. It's very hot during the day and cold at night. Shrubs and cacti are sparsely distributed in the sandy soil.

## Temperate Deciduous Forest

Found mainly in the mid latitudes where there are four distinct seasons. Summers are warm, winters are relatively mild and there's rainfall all year round. Deciduous trees lose their leaves in winter to cope with the colder weather.



## 1. Characteristics of Global Ecosystems.

The climate in an area determines what type of ecosystem forms. The map shows the global distribution of seven major biomes (ecosystems).

## 3. Rainforests Have Very High Biodiversity.

1. Biodiversity is the variety of organisms living in a particular area – both plants and animals.
2. Rainforests have extremely high biodiversity – they contain around 50% of the world's plant, animal and insect species and may contain around half of all life on Earth.
3. Rainforests are stable and productive environments because their climate is constant – it's hot and wet all the time. Plants and animals don't have to cope with changing conditions and there is always plenty to eat.
4. Many organisms have evolved to depend on just a few other species for survival – they are specific to a particular habitat and food source. Many species are also only found in a small area.
5. Deforestation and uncontrolled development of the rainforest are likely to lead to the extinction of many species and the loss of biodiversity. The number of threatened species in Brazil increased from 628 in 2008 to 1182 in 2014.

## 2. Tropical Rainforests Are Hot And Wet All Year Round.

Climate	The climate is the same all year round – no seasons. It's hot (generally between 20-28°C). This is because the sun's energy is more intense near the equator. Rainfall is very high, around 2000mm per year. It rains every day.
Plants	Most trees are evergreen to help them take advantage of the continual growing season. Many trees are really tall and the vegetation cover is dense. There are lots of epiphytes (plants that grow on other living plants and take nutrients and moisture from the air) e.g. orchids and ferns.
Soil	The soil isn't very fertile as heavy rain washes nutrients away. There are surface nutrients due to decayed leaf fall, but this is very thin as decay is fast in the warm, moist conditions.
People	Many indigenous people have adapted to life in the rainforests. They make a living by hunting and fishing, gathering nuts and berries, and growing vegetables in small garden pots.
Animals	Rainforest ecosystems are believed to contain more animal species than any other ecosystem. Gorillas, jaguars, anacondas, tree frogs, sloths and howler monkeys are all found here and there are also many species of insects and birds.

## 4. Rainforests as Interdependent Ecosystems.

All the parts of the rainforest (climate, water, soil, plants, animals and people) are dependent on one another – if any one were to change, everything else is affected.

For example:

1. The warm and wet climate helps fungi and bacteria on the forest floor to decompose dead plant material rapidly. This makes the surface soil high in nutrients, meaning plants can grow rapidly.
2. Plants pass on their nutrients when eaten by animals. The dense vegetation provides lots of food, so animal population are high. When the animals die, their nutrients are transferred back to the soil, making it richer and encouraging lots of vegetation. This is a key part of the nutrient cycle.
3. Many plant and animal species have formed symbiotic relationships (where they each depend on the other for survival e.g. Agouti and Cecropia trees).



# Unit 1B – Hot Deserts

Key vocab	Definition
Interdependent	All organisms in an ecosystem depend upon each other. If the population of one organism rises or falls, then this can affect the rest of the ecosystem.
Biodiversity	The variety of organisms found in a particular habitat.
Adaptation	The process of changing so an animal or organism can become better suited to its surrounding environment.
Desertification	The degradation of land, making it drier and less productive.
Biotic	Living components of hot deserts including plants, animals and people.



2. Plant Adaptations
<ol style="list-style-type: none"> <li>1. Plant roots are either extremely long to reach deep water supplies or they can spread out very wide near the surface to absorb as much water as possible when it rains.</li> <li>2. Many plants have large, fleshy stems (e.g. cacti) for storing water and thick waxy skin to reduce transpiration.</li> <li>3. Some plants have small leaves or spines to lower their surface area and reduce transpiration. These spines can contain toxins to protect the plants from predators.</li> <li>4. Some plants only germinate when it rains – if it's too dry, the seeds stay dormant. However, when they do grow, they grow quickly to make the most of the wet conditions.</li> </ol>

## 1. Characteristics of a Hot Desert

Climate	There is very little rainfall – less than 250mm per year. Rainfall patterns vary – it might rain once every few years. Temperatures are extreme because of the lack of cloud cover – it can reach 45°C in the day and then drop below 0°C at night.
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Soil	A lack of leaf fall limits the soil's fertility. Little rainfall means the soil dries out often. Soil is often shallow with a gravelly texture.
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Plants	Due to low rainfall, plant growth is sparse – the plants that do grow, do not need much water. Plants are usually short even though cacti can grow fairly tall. Many plants have short life cycles, growing quickly after rain.
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Animals	Hot deserts contain animals adapted to the harsh environment. Mammals tend to be small and nocturnal e.g. Kangaroo rats. Most birds leave the desert during the harshest conditions but some live there all year round.
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People	Many people living in the desert grow a few crops near natural water sources, usually in the desert fringes. Indigenous people are often nomadic – they keep travelling to find food and water for their livestock.
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## 2. Animal Adaptations

<ol style="list-style-type: none"> <li>1. Nocturnal animals stay cool by sleeping when the temperatures are hottest. Many animals have long limbs or ears, giving them a larger surface area to lose heat from.</li> <li>2. Lots of animals live in underground burrows, where temperatures are less extreme.</li> <li>3. Some animals store fat that they break down into water when needed (e.g. camel).</li> <li>4. Some animals get water from their food and most desert animals minimise their water loss through sweat and urine.</li> <li>5. Adaptations to cope with the sand are common, e.g. camels use their triple eyelids and long eyelashes and ability to close their nostrils to keep sand out of their eyes and nose during sandstorms. They also have large, flat feet so they don't sink into the sand.</li> </ol>
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## 4. Desertification Factors

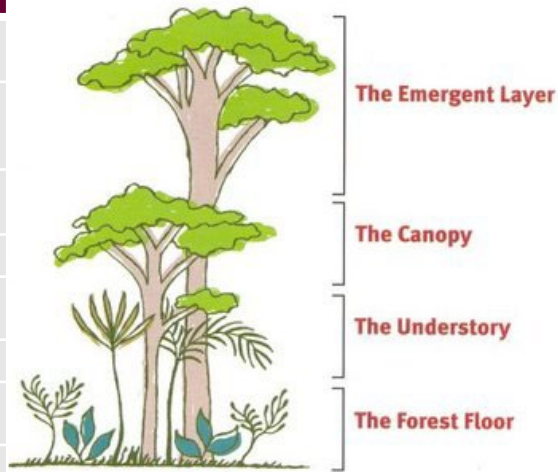
Rainfall and temperature	Climate change means less rain and higher temperatures causing more plants to die.
Removal of fuel wood	Removal of trees for wood leaves the soil exposed.
Overgrazing and over-cultivation	Animals eat more plants than they can grow and if crops are planted in the same areas, the nutrients in the soil are used up.
Population growth	More people means more pressure on the land – more deforestation and overgrazing.

## 5. Ways To Reduce The Risk Of Desertification

Water management	Growing crops that need little water can reduce water use. Using drip irrigation on crops instead of surface irrigation means that the soil isn't eroded by loss of water being added all at once.
Tree planting	Trees can be planted to act as windbreaks, reducing wind erosion. Trees can also stabilise the sand and prevent desert from encroaching on farmland.
Soil management	Leaving areas of land to rest in between grazing or planting lets them recover their nutrients. Rotating crops that take different nutrients from the soil prevents the same nutrients from being continually removed.
Appropriate technology	This involves using cheap, sustainable and easily available materials to build things that are easy for local people to maintain. For example, sand fences which trap windblown sand or terraces to stabilise the soil.

# Unit 1b - Tropical Rainforests

Key vocab	Definition
Adaptation	



## 2. Plants have Adapted to the Physical Conditions

- Plants in the rainforest are adapted to high rainfall, high temperatures and competition for light.
- Trees compete for sunlight by growing tall.
  - Plants have thick, waxy leaves with pointed drip-tips. These channel rainwater off the point, encouraging runoff so the weight of the water doesn't damage the plant. This also means there's no standing water for fungi and bacteria to grow in. The leaves' waxy coating also helps to repel the rain.
  - Climbing plants, such as lianas, use tree trunks to reach sunlight.
  - Many trees have smooth, thin bark as there's no need to protect the trunk from cold temperatures. The smooth surface also helps water to run off easily.
  - Large, stable buttress roots support the tall trees' trunk.
  - Plants drop their leaves gradually throughout the year, meaning they can go on growing all year round.

## 1. Four Layers of The Rainforest

The rainforest has four layers of plants with different adaptations.

- Emergent Trees (40m)
- Main Canopy (30m)
- Undercanopy (20m)
- Shrub Layer (10m)

Emergent trees only have branches at their crown, where the most light is available. Some under canopy plants have large leaves to absorb as much sunlight as possible.



## 4. Case Study – Deforestation in the Amazon

- The Amazon is the largest rainforest on Earth – it covers an area of around 8 million km<sup>2</sup> including parts of Brazil, Peru, Colombia, Venezuela, Ecuador, Bolivia, Guyana, Suriname and French Guiana.
- Almost 18 million hectares of forest were lost between 2001 and 2012 – an average of 1.4 million hectares were lost per year in this period.
- Since 2012, deforestation in the Amazon has been increasing. In 2021, deforestation in the Amazon has been increasing. In 2021, deforestation rates were at their highest since 2006.
- Its estimated that around 40% of the Amazon will have been deforested by 2050 if the current rate of deforestation is not reduced.

## 3. Animal Adaptations

Strong limbs	Many animals spend their entire lives high up in the canopy. They have strong limbs so that they can move around their habitat quickly and easily, e.g. howler monkeys.
Short, pointed wings	Some birds have short, pointed wings so that they can easily manoeuvre between the dense tangle of trees, e.g. the harpy eagle.
Suction cups	Suction cups help some animals climb, e.g. tree frogs. Others have flaps of skin that help them glide between trees, e.g. flying squirrels.
Camouflage	Some animals are camouflaged, e.g. leaf-tailed geckos look like leaves so they can hide from predators.
Sharp sense of smell	Some animals are adapted to the low light levels on the rainforest floor, e.g. anteaters have a sharp sense of smell, so they can detect predators without seeing him.
Nocturnal	Many animals are nocturnal, e.g. sloths. They feed at night when it's cooler – this helps them to save energy.
Ability to swim	Many animals can swim, e.g. jaguars. This helps them cross river channels.

## 4. Why Is The Amazon Being Cut Down?

Commercial Farming	Forest is cleared to make space for cattle grazing or for huge plantations. Cattle ranching is the main cause of deforestation in the Amazon.
Subsistence Farming	Forest is cleared by small-scale farmers who need land to grow food for themselves and their families.
Commercial Logging	The Amazon is full of valuable hardwood trees such as mahogany, which makes logging extremely tempting to both legal and illegal businesses.
Mineral Extraction	Gold, iron ore and copper are mined and exported to help boost countries' development. Explosives are sometimes used to clear earth, and deep pits have to be dug to reach the mineral deposits.
Energy Development	Building hydroelectric dams floods large areas of forest. The construction of the Balbina Dam flooded 2400km <sup>2</sup> of rainforest.

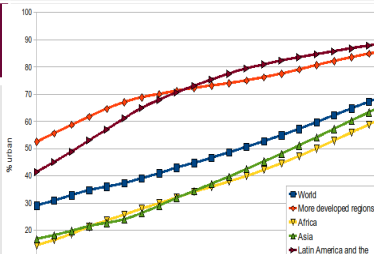


# Unit 2a – Urban Issues and Challenges

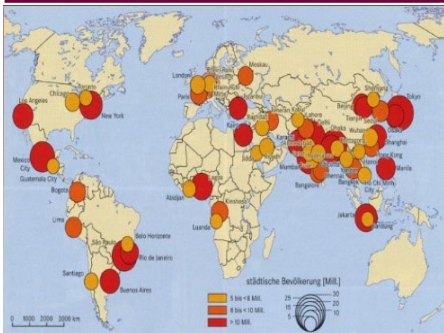
Key vocab	Definition
Rural - urban migration	The movement of people from rural to urban areas.
Natural Increase	When the birth rate exceeds the death rate.
Megacity	An urban area with over 10 million people living there.
Integrated Transport System	This is the linking of different forms of public and private transport within a city and the surrounding area.
Brownfield Site	Brownfield sites is an area of land or premises that has been previously used, but has subsequently become vacant, derelict or contaminated.
Greenbelt Area	This is a zone of land surrounding a city where new building is strictly controlled to try to prevent cities growing too much and too fast.
Urban Regeneration	The investment in the revival of old, urban areas by either improving what is there or clearing it away and rebuilding.
Sustainable Urban Living	Sustainable urban living means being able to live in cities in ways that do not pollute the environment and using resources in ways that ensure future generations also can use them.

## 1. Where is Urbanisation happening?

Urbanisation is happening all over the world but in LICs and NEEs rates are much faster than HICs. This is mostly because of the rapid economic growth



## 2. Types of Cities



More than two thirds of current megacities are located in either NEEs (Brazil) and LICs (Nigeria). The amount of megacities are predicted to increase from 28 to 41 by 2030.

## 3. Causes of Urbanisation

Push	Pull
<ul style="list-style-type: none"> <li>Natural disasters</li> <li>War and Conflict</li> <li>Mechanisation                             <ul style="list-style-type: none"> <li>Drought</li> </ul> </li> <li>Lack of employment</li> </ul>	<ul style="list-style-type: none"> <li>More Jobs</li> <li>Better education &amp; healthcare</li> <li>Increased quality of life.</li> <li>Following family members.</li> </ul>
Increase in birth rate (BR)	Lower death rate (DR)
<ul style="list-style-type: none"> <li>High percentage of population are child-bearing age which leads to high fertility rate.</li> <li>Lack of contraception or education about family planning.</li> </ul>	<ul style="list-style-type: none"> <li>Higher life expectancy due to better living conditions and diet.</li> <li>Improved medical facilities helps lower infant mortality rate.</li> </ul>

## 4. Sustainable Urban Living

**Sustainable urban living means being able to live in cities in ways that do not pollute the environment and using resources in ways that ensure future generations also can use then.**

Water Conservation	Energy Conservation
<p><b>This is about reducing the amount of water used.</b></p> <ul style="list-style-type: none"> <li>Collecting rainwater for gardens and flushing toilets.</li> <li>Installing water meters and toilets that flush less water.</li> <li>Educating people on using less water.</li> </ul>	<p><b>Using less fossil fuels can reduce the rate of climate change.</b></p> <ul style="list-style-type: none"> <li>Promoting renewable energy sources.</li> <li>Making homes more energy efficient.</li> <li>Encouraging people to use energy.</li> </ul>
Creating Green Space	Waste Recycling
<p><b>Creating green spaces in urban areas can improve places for people who want to live there.</b></p> <ul style="list-style-type: none"> <li>Provide natural cooler areas for people to relax in.</li> <li>Encourages people to exercise.</li> <li>Reduces the risk of flooding from surface runoff.</li> </ul>	<p><b>More recycling means fewer resources are used. Less waste reduces the amount that eventually goes to landfill.</b></p> <ul style="list-style-type: none"> <li>Collection of household waste.</li> <li>More local recycling facilities.</li> <li>Greater awareness of the benefits in recycling.</li> </ul>

## 5. AC Challenges and Opportunities: London

- London is the capital city of the United Kingdom. It is located in the South East of England and has a population of roughly 9 million people.
- London has become a major economic hub, being able to trade with countries in different time zones - China, India and Australia in the morning and the USA in the evening.
- London is home to 271 global headquarters of TNCs
- Most people who work in London work in the following 5 sectors – Financial, Admin/health/education, Business, Transport and communication
- Many unskilled workers move to London for jobs too, these include delivery drivers, retail and hospitality workers, cleaners, rubbish disposal and construction.
- Migration to London has been happening for 100's of years, however, the main reason for migration today is for jobs and education. 1.6 million Europeans live in the city.
- Housing costs in London has risen exponentially in inner and outer London. This is due to international investors buying property in the city centre.
- Air quality in London is dangerously poor in London – a congestion charge was implemented in 2003 to deter people from driving into the city centre at peak times
- Pedestrian only zones created in the city centre
- Healthy streets - £2.1 billion were invested in cycling and public transport use to improve road safety and air quality.
- 12 low emission bus zones in the city.

## 6. LIC Challenges and Opportunities: Lagos

- Lagos is located on the south Coast of Nigeria in Africa. It is Africa's biggest cities and one of the fastest growing cities in the world, with a population of 14.8 million people.
- Rapid migration has occurred in Lagos. From 1990-2004, over 7 million people moved from rural areas of Nigeria to live in the economic capital.
- Many people move to Lagos for better job opportunities, however, many people work in the informal sector.
- Social - Many people live without electricity High diseases rate and low life expectancy due to overcrowding in slums.
- Economic - High rate of corruption to government officials or people in power. Business is limited due to poor infrastructure and very little investment into independent shops etc.
- Environmental - Large scale traffic issues – it takes many people 2+ hours to get to work. Due to poor sanitation and raw sewage, slums are heavily polluted.
- Home to over 100,000 people, Makoko is the biggest slum in Nigeria.
- Most of the houses in Makoko are floating on top of a lagoon near to the east coast of Lagos – many people use boats as a mode of transport.
- Many of the people who live in Makoko today were born in the slum and generations have lived there before them, creating a strong sense of community
- Over 2,000 people come to Lagos each day in search for a job as the wages are higher and there are more jobs in the city.
- Many of these are in the informal sector where people do not have any job security, sick or holiday pay or pensions.

**Year 10/11 BTEC Tech Award Health and Social Care: Component 2 – Health and Social Care Services and Values**

**A – Understand the Different types of health care services and the barriers to accessing them**

**B – Understand the Skills, Attributes and Values Required to Give Care**

<b>Key Vocabulary:</b>		
1	Health Conditions	Impact on a person’s health and wellbeing.
2	Informal Support	Provided by people who are not paid, such as friends and family.
3	Formal Support	Provided by trained, paid employees, such as health and social care professionals.
4	Health Services	A service providing medical care.
5	Team	A group of individuals with a shared purpose for which they are accountable, and requires interaction between team members.
6	Social Care	Supports people who are vulnerable, they might be unsafe, ill or have a disability.
7	Barrier	Something unique to the health and social care system that stops a service user from accessing a service.
8	Skills	The ability to undertake a certain task, such as being able to communicate effectively or take someone’s blood pressure.
9	Attributes	Qualities that make someone who they are, such as being kind or honest.
10	Values	Principles and standards that we use to guide our thoughts, decisions and behaviour.
11	Obstacle	Something personal to an individual that blocks a person moving forward or when an action is prevented or made difficult.
12	Person-centred care	To ensure care is person-centred and based on individual wishes.

<b>A1 Health Care Services</b>		
13	<b>Health Conditions:</b> <ul style="list-style-type: none"> <li>• Arthritis</li> <li>• Cardiovascular Conditions</li> <li>• Type 2 Diabetes</li> <li>• Dementia</li> <li>• Obesity</li> <li>• Respiratory Conditions</li> <li>• Additional needs</li> </ul>	14 <b>Health Services:</b> <ul style="list-style-type: none"> <li>• Primary Care</li> <li>• Secondary Care</li> <li>• Tertiary Care</li> <li>• Allied Health Professions</li> <li>• Multidisciplinary Team Working</li> </ul>
<b>A2 Social Care Services</b>		
15	<b>Social Care Services:</b> <ul style="list-style-type: none"> <li>• Children and Young People</li> <li>• Adults and/or Children with Specific Needs</li> <li>• Older Adults</li> </ul> <b>Additional Care:</b> <ul style="list-style-type: none"> <li>• Informal care</li> <li>• Voluntary Care</li> </ul>	
<b>A3 Barriers to accessing services</b>		
16	<b>Type of Barrier:</b> <ol style="list-style-type: none"> <li>1.Physical</li> <li>2.Sensory Disability</li> <li>3.Social and Cultural</li> <li>4.People who are EAL and/or Speech and Language Impairments</li> <li>5.Geographical</li> <li>6.Learning Disabilities</li> <li>7.Financial</li> </ol>	<b>How They Can Overcome by the Service Providers or Users:</b> <ol style="list-style-type: none"> <li>1.Ramp, wider doorways, accessible toilets/rooms, stair lifts, hoists</li> <li>2.Hearing aids, BSL interpreters, larger print, braille, extra staff</li> <li>3.Awareness campaigns, posters/ leaflets, clinics for men and women, choice of service provider, collaboration with community and faith groups</li> <li>4.Writings in accessible languages, face-to-face and telephone interpretation assistance, health and wellbeing meetings, longer appointments, advocates, staff training, staff awareness</li> <li>5.Local transport links for elderly and/or disabled. Home visits, community clinics, tele-health schemes</li> <li>6.Health passports, use of Learning Disability Nurses (LDNS’s), support workers, longer appointments, quiet waiting zones, adhering to the accessible Information Standard, easy read leaflets</li> <li>7.NHS :exemption certificates, low income scheme, vouchers for eye tests; glasses and lenses, healthcare travel costs scheme, Charity schemes: community transport</li> </ol>

17	<b>B1 Skills and Attributes in Health and Social Care</b>	<b>B2 Values in Health and Social Care</b>
Skills <ul style="list-style-type: none"> <li>•Problem solving</li> <li>•Observation</li> <li>•Dealing with Difficult Situations</li> <li>•Organisation</li> </ul> Attributes <ul style="list-style-type: none"> <li>•Empathy</li> <li>•Patience</li> <li>•Trustworthiness</li> <li>•Honesty</li> </ul>		The 6 Cs <ul style="list-style-type: none"> <li>•Care</li> <li>•Compassion</li> <li>•Competence</li> <li>•Communication</li> <li>•Courage</li> <li>•Commitment</li> </ul>
<b>B3 The Obstacles Individuals Requiring Care May Face</b>		
Potential Obstacles: <ol style="list-style-type: none"> <li>1.Emotional/ Psychological</li> <li>2.Time Constraints</li> <li>3.Availability of Resources</li> <li>4.Unachievable Targets</li> <li>5.Lack of Support</li> <li>6.Specific to the Individual</li> </ol>		The Impact: <ol style="list-style-type: none"> <li>1.Lack of motivation, low self-esteem acceptance of current state, anxiety and stress</li> <li>2.Work and family commitments</li> <li>3.Financial, equipment and amenities</li> <li>4.Unachievable, unrealistic timescale</li> <li>5.Family and Friends</li> <li>6.Ability/ disability, health, addiction</li> </ol>
19	<b>B4 The Benefits to Individuals of the Skills, Attributes and Values in Health and Social Care Practice</b>	
People Will: <ul style="list-style-type: none"> <li>•Be supported to overcome their personal barriers</li> <li>•Receive high quality care</li> <li>•Receive person-centred care based on the individuals needs</li> <li>•Be treated with respect</li> <li>•Not be discriminated against</li> <li>•Be empowered and have independence</li> <li>•Be involved in care decisions</li> <li>•Be protected from harm</li> <li>•Feel comfortable to raise complaints</li> <li>•Have their dignity and privacy protected</li> <li>•Have their confidentiality protected</li> <li>•Have their rights promoted</li> </ul>		

# Year 11 GCSE History Autumn Term Knowledge Organiser Elizabethan challenges at home and abroad: 1569-88

Key Vocabulary:			Plots and revolts at home		Spain and the Spanish Armada	
1	New World	North and South America	13	<b>Revolt of the Northern Earls (1569):</b> <u>The aim</u> with the support of the Spanish, replace Elizabeth with MQS and marry her to the Duke of Norfolk. The Earls marched to Durham and celebrated a catholic mass in the cathedral. Headed south but Spanish troops never arrived and Elizabeth raised an army of 14000 men. 450 rebels executed. The Earl of Westmoreland escaped and the Earl of Northumberland executed. <u>Political/power reasons for the plot:</u> under Mary I, the Earls had been very influential but not as influential under Elizabeth. Job of looking after the borders with Scotland given to Sir John Foster. Lost the rights to a valuable, copper mine found on his land to the queen in 1567. The northern earls resented the influence favourites like William Cecil and Robert Dudley had over the queen. <u>Religious reasons for the plot:</u> The Earls were catholic, the bishop of Durham ( James Pilkington) was a committed and unpopular protestant. <u>The revolt was significant</u> as 1.) it was the most serious rebellion by English Catholics 2.) It prompted harsher treatment of Catholics and widened the definition of treason to include calling Elizabeth a heretic 3.) It encouraged the pope to excommunicate Elizabeth in 1570.	16	<b>Why was there tension between England and Spain?</b> <u>Commercial rivalry:</u> England wanted new markets to trade with and make money but Spain controlled the Netherlands (England's main route into the European markets and the wool trade) and Spain controlled much of the New World <u>Piracy-</u> in 1572 Elizabeth hired Francis Drake as a privateer- he went to Panama and captured £40,000 of Spanish silver and in 1577 Elizabeth gave Drake secret instructions to attack Spain's colonies in the New World. <u>Marriage:-</u> Elizabeth rejected Philip's marriage proposal <u>Religious reasons-</u> Phillip II was a strict Catholic and opposed Elizabeth's religious settlement and in 1571 the Pope had excommunicated Elizabeth and Elizabeth had executed MQS in 1587. <u>The Netherlands:-</u> In the 1570s Elizabeth increasingly supported the Dutch rebels. Sent a loan of £100,000 to the Dutch rebels and a future promise of an armed force to enforce the Pacification of Ghent.
2	Thomas Howard, Duke of Norfolk	One of England's most senior nobles and had strong catholic sympathies despite being a protestant.	14	<b>Other Catholic Plots:</b> Ridolfi Plot (1571) Plan to murder Elizabeth, launch a Spanish attack and put Mary Queen of Scots on the throne. Throckmorton Plot (1583) Planned for the French Duke of Guise to invade England, free Mary , overthrow Elizabeth and restore Catholicism in England. Babington Plot (1586) The Duke of Guise would invade England and put Mary on the throne.	17	<b>Spanish Armada 1588</b> After being delayed by the Singeing of the King of Spain's Beard the Armada set sail in 1588. With 130 ships and 30,000 men under the command of the Duke of Medina-Sidonia was to sail along the English Channel to the Netherlands, pick up the Duke of Parma and his army of 27,000 men before invading England and impose a Catholic government in England.
3	Council of the North	Used to implement Elizabeth's laws and authority in the North of England.	15	<b>Why Mary, Queen of Scots was executed:</b> <u>Plots at home:</u> fours plots planned to overthrow Elizabeth <u>Foreign Threats:</u> Phillip II of Spain was a devout Catholic and disliked Elizabeth supporting the Dutch rebels <u>Mary Queen of Scots herself:</u> She had been involved in all plots, was a legitimate Catholic heir to the throne, had links to France and claimed to be the rightful queen of England <u>Elizabeth's parliament and advisers:</u> Act for the Preservation of the Queen's Safety (1585) stated that Mary could be killed if she had been involved in a plot, Sir Francis Walsingham had a network of spies and gathered evidence against Mary, her advisers were Protestant.	18	<b>Why the Armada failed:</b> <u>1.) English strengths:</u> the English ships were Galleons and were faster and more manoeuvrable, they could also fire more cannon balls than the Spanish ships but they only had 24 when the armada invaded. <u>2.) English tactics-</u> Elizabeth left key decisions to her commanders (including Sir Francis Drake) and they used fire ships on 6 <sup>th</sup> August which did little damage but panicked and scattered the Spanish ships. <u>3.) Spanish weaknesses-</u> their supplies (the food was rotting and they didn't have enough cannon balls) and Phillip II didn't listen to the advice of his commanders. They also had communication problems which meant that Medina-Sidonia couldn't collect the Duke of Parma before the English attacked <u>4.) Chance-</u> after the Battle of Gravelines the Armada headed north and thousands of them lost their lives in shipwrecks caused by storms.
4	Sir Francis Walsingham	Elizabeth's Secretary of State and chief spymaster				
5	Privateers/ sea dogs	Individuals with their own armed ships that capture other ships for their cargo, often with the support and authorisation of the government				
6	Francis Drake	Elizabeth hired him as a privateer.				
7	Circumnavigate	To travel all the way around the world.				
8	Spanish Fury	The Spanish rampaged through Dutch provinces as they left				
9	Pacification of Ghent 1576	Spanish troops expelled from Netherlands, political autonomy to be returned and end of religious persecution.				
10	Treaty of Joinville 1584	The King of France and the King of Spain became allies against Protestantism.				
11	Treaty of Nonsuch 1585	Effectively put England and Spain at war as Elizabeth agrees to help the Dutch with money and soldiers.				
12	Singeing of the King of Spain's beard 1587	Drake sailed into Cadiz harbour, Spain's most important Atlantic port, and over 3 days destroyed 30 ships.				

# Year 11 GCSE History Autumn Term Knowledge Organiser Elizabethan government and society, 1558-69

Key Vocabulary:			The situation on Elizabeth's accession	How settled is religion?
1	Nobility	Belonging to the aristocracy. E.g. a Lord or Lady	<p>19 <b>Society and Government:</b></p> <p>90% of English population lived in the countryside Social hierarchy: monarch at the top, then the nobility (Lords and Ladies), gentry, Yeomen, tenant farmers, labouring poor and the homeless and vagrants at the bottom <b>The Court</b> was made up of the nobility and were the monarch's key advisors and friends. <b>The Privy Council</b> advised the monarch on government policy and oversaw law and order and security in England <b>Parliament</b> was made up of the House of Lords and the House of Commons and could only be called and dismissed by the monarch. It passed laws and advised the monarch</p> <p>20 <b>The Virgin Queen:</b></p> <p>Elizabeth's accession caused controversy as her gender; legitimacy religion were questioned. Women were seen as weak, and the property of their husband's and Christian religion taught that women should be under the authority of men. Elizabeth's legitimacy was in doubt because of how her father (Henry VIII) divorced his first wife, Catherine of Aragon, in order to marry Elizabeth's mother, Anne Boleyn.</p>	<p>22 <b>The Religious Settlement</b></p> <p><b>Catholic Church:</b> The Pope in Rome is the head of the church, the bible and church services should be in Latin, priests are special and should wear special vestments and not marry. Transubstantiation happens (a miracle when the bread and wine becomes the body and blood of Christ) <b>Protestantism:</b> there should be no pope, the bible and church services should be in English, sins can only be forgiven by God (not priests), priests are not special and should not wear special clothing and can get married, churches should be plain and simple so not to distract people from worshipping god. <b>The Elizabethan Settlement happened in 1559</b> and was Elizabeth's attempt to solve the religious problems and establish a form of Protestantism that Catholics could accept. <b>The Act of Supremacy:</b> Elizabeth supreme governor and all clergy had to swear an oath of loyalty to her <b>The Act of Uniformity</b> introduced a protestant Common Prayer Book that all churches had to use, the services and bible had to be in English but the meaning of the bread and wine taken in church was left open. <b>The settlement was largely successful</b> 8,000 priests took the oath of supremacy, she replaced the catholic bishops that refused to take the oath, the majority of the public accepted it as the new Prayer Book kept the interpretation of beliefs open.</p>
2	Gentry	People of a high social class.		
3	Yeomen	Men who held a small amount of land or an estate.		
4	Tenant farmers	Farmed rented land usually owned by yeomen or gentry.		
5	Merchants	Traders.		
6	Craftsmen	Skilled employees.		
7	Militia	A military force of ordinary people, rather than soldiers, raised in an emergency.		
8	Privy Council	Advisors to Elizabeth.		
9	Justices of the Peace	Large landowners who kept law and order.		
10	Secretary of State	Elizabeth's most important Privy Counsellor.		
11	Divine Right	Belief that the monarchs right to rule came from God	<p>21 <b>Challenges at home and abroad:</b></p> <p><b>England had financial weakness:</b> England had fought costly wars before Elizabeth came to the throne (and lost) and was £300,000 in debt. There had been a series of bad harvests which increased poverty. <b>The French threat:</b> France was wealthier and had a larger population. They were an ally of Scotland another enemy of England (The Auld Alliance). The French port of Calais had been in English control since 1347 but was lost when England went to war with France during Mary I's reign <b>Mary Queen of Scots</b> was Elizabeth's cousin (granddaughter of Henry VIII's sister), had a strong claim to the throne, was half French and married to Francis, the heir to the French throne and declared herself the legitimate Catholic claimant to the English throne. She also had a son, James. <b>Religious problems:</b> The reformation began in 1532 and since then it had flip flopped between Protestant (Edward VI) and Catholic (Mary I). <b>Spain</b> was a powerful catholic country who's king, Phillip II had been married to Mary I and wanted to marry Elizabeth.</p>	
12	Succession	The issue of who was going to succeed the throne after the existing monarch died.		
13	Legitimate	Being born in wedlock when the existing king and queen were married.		
14	Auld Alliance	A Friendship between France and Scotland		
15	Puritans	Radical/extreme protestants		
16	Papacy	The system of church government ruled by the Pope.		
17	heretics	People who refused to follow the religion of the monarch.		
18	Excommunicated	Expulsion from the Catholic Church.		
			<p>23 <b>Catholic challenge</b></p> <p>1/3 of English nobility were Catholic especially those in the north of England. They disliked Elizabeth's favourites such as Robert Dudley and Sir William Cecil. In 1566 the pope issued an instruction to English Catholics should not attend Church of England services. However although there were punishments for those that didn't follow the settlement these were generally not enforced as Elizabeth didn't want to create martyrs and the majority of Catholics stayed loyal to Elizabeth.</p>	
			<p>24 <b>Puritan challenge:</b></p> <p>The Puritans had two issues 1.) crucifixes (Puritans thought they were idols and wanted to get rid of them) 2.) vestments (Puritans thought priests did not need any special clothing at all.) Although they had support in London and several powerful and influential supporters at court (Robert Dudley, the Earl of Leicester and Sir Francis Walsingham) they did not enjoy widespread support amongst the country.</p>	

# Year 11 Hospitality and Catering

## Autumn Term Knowledge Organiser – Factors affecting menu planning

Key Vocabulary:			Sustainability			Factors to consider					
1	<b>Nutritional value</b>	The health benefits and dietary content of food items, including essential nutrients like vitamins, minerals, proteins, fats, and carbohydrates, which are considered in menu planning to offer balanced and healthy options.	7	<b>Reduce</b>	<p><b>Food waste:</b> 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.</p> <p><b>Energy use:</b> 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.</p> <p><b>Food miles:</b> Using local suppliers means that the food does not have to travel as far from ‘field to fork’.</p> <p><b>Water usage:</b> Use less in cooking by only just submerging vegetables or using a steamer. Use an energy and water efficient dishwasher.</p>	10	<b>Customer base</b>	Why might people be eaten out? Special occasions, business, family meal, tourists etc. All these have different needs for food and service.			
2	<b>Budgeting</b>	The practice of creating a financial plan that outlines expected revenues and expenses for menu items, ensuring that menu pricing and costs are managed within financial constraints.				11	<b>Type of provision</b>	What is the style of service? E.g. plate, counter, table, gueridon etc. This will affect the level of service that the staff provide and the skills needed by the kitchen and front of house staff.			
3	<b>Dietary requirements</b>	Specific needs or restrictions related to food consumption, such as allergies, intolerances, or medical conditions, that must be accommodated in menu planning to ensure customer safety and satisfaction. essential amino acids.				12	<b>Time of year</b>	Food in season is readily available and peak of quality and taste. Lower prices and less environmental impact in transport and storage plays a part. Foods not in season have to be imported or frozen and can therefore affect quality and taste.			
4	<b>Food waste</b>	The amount of food that is discarded or unused, which can be minimized through careful menu planning and portion control to improve sustainability and reduce costs.				8	<b>Reuse</b>	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.	13	<b>Equipment available</b>	Some items on a menu may need specialist equipment such as pizza ovens, deep fat fryers, tandoor ovens etc. You cannot offer food on the menu if you don’t have a way of cooking it. If you sell a lot of a dish, you may need to buy something to speed up the preparation e.g. electric floor standing mixer.
5	<b>Seasonality</b>	The availability and use of ingredients that are in season during specific times of the year, affecting menu design and ingredient costs while allowing for fresher and more flavorful dishes.									
6	<b>Sustainability</b>	The conservation of natural resources and the prevention of excess waste. This could include buying local produce, using organic ingredients, buying meat, fish and poultry from assured producers or offering meat-free versions of dishes.									

# Year 11 Component 2 Music Knowledge Organiser

## Key Vocabulary:

1	Repetition	Repeating chord patterns/melody lines
2	Sequence	A melody that moves up and down in pitch but the pattern of the notes stays the same – for example, CDEFG – DEF#GA
3	Instrumentation	Choice of instruments and the way they are played to create effects and change the timbre of the music
4	Texture	The layers of the sound – homophonic – 1 layer of music or all instruments playing the same thing, polyphonic – lots of layers of music, contrapuntal
5	Modulation	Changing key during the second section of your piece – major to minor, C major to G major etc
6	Intonation	The pitch and accuracy of a musician or musical instrument
7	Dynamics	The volume
8	Metronome	A timing device used for marking rhythm
9	Phrasing	The shaping of a sequence of notes to show expression
10	Articulation	How you say or play the notes or words

## Music Theory

### 11 Composing

- melodic ideas and fragments
- rhythmic patterns
- chords and chord progressions
- harmonic systems
- textures
- riffs and hooks
- sound palettes
- improvisation and experimentation
- non-musical starting points such as themes, texts and images

### 12 Reviewing your composition – every lesson

1. What ideas have you composed?
2. What techniques did you use to develop your composition?
3. What sections of music have you added to your composition?
4. What do you need to improve next time?
5. Are there any techniques you need to add to develop your compositions further?

### 13 Reviewing your progress - Performing

1. What part of your practice went well?
2. What techniques did you use to develop your performance skills?
3. What was your musical focus for today's practice?
4. What do you need to improve on next time?
5. Are there any techniques you need to work on further?

#### Confidence

#### Fluency

**Accuracy (timing, tone, intonation, dynamics and tempo);**

**Rhythmic control**

#### Musicality

#### Dynamics

#### Expression

#### Phrasing

## Music Theory

### 14 Reviewing your progress - DAW

1. What techniques did you use to develop your DAW skills?
2. What was your musical focus for today's lesson?
3. What do you need to improve on next time?
4. Are there any techniques you need to work on further?
5. Can you use the automation function?
6. Have you added: reverb, panning, compression, tempo changes etc?

### 15 Evidence

Learning Aim A – Demonstrate professional and commercial skills for the music industry:

Think about: practice warm-ups, selection of music, instruments, samples

How you use them: show you can select and use these skills effectively

Learning Aim B – Apply development processes for music skills and techniques:

Think about: how you can show the development of your work over time

### 16 Life skills through music

#### Independent enquirers

#### Creative thinkers



#### Reflective learners – reviewing progress continually

#### Team workers – being part of the group

#### Self-managers – working to deadlines

#### Effective participators – having your voice in a group

# KS4 Physical Education Spring Term Knowledge Organiser

Key Vocabulary:			8 Health and Wellbeing		9 Career Opportunities	
1	Cholesterol	High cholesterol = too much of a fatty substance called cholesterol in your blood. Caused by eating fatty food, not exercising enough, being overweight, smoking and drinking alcohol	<p><b>Well being</b> – a combination of physical, emotional and social health. Positives effects of training/exercise on:</p> <p><b>Physical health</b></p> <ul style="list-style-type: none"> <li>• Stronger bones (increased bone density)</li> <li>• Lower cholesterol / reduced obesity</li> <li>• Increase/development of components of fitness</li> <li>• Increase life expectancy</li> </ul>  <p><b>Emotional health</b></p> <ul style="list-style-type: none"> <li>• To increase self esteem/confidence – increased endorphins released</li> <li>• Reduced risk of age-related diseases - dementia</li> <li>• Relieve stress and tension</li> <li>• Fun/enjoyment / reduced boredom</li> </ul>  <p><b>Social health</b></p> <ul style="list-style-type: none"> <li>• To develop teamwork skill</li> <li>• To meet new people/friends</li> <li>• Develop communication skills</li> <li>• Develop leadership skills</li> </ul> <p><b>Negative effects of training on:</b></p> <ul style="list-style-type: none"> <li>• Physical health – overexertion leading to heart failure / overuse injuries</li> <li>• Emotional health – training can lead to injury and cause depression</li> <li>• Social health – training long hours means less time spent with family.</li> </ul>		<p><b>Sports coach</b></p> <p>Plan fun, engaging safe coaching sessions (can be sport specific). Give feedback on performance, how to improve and motivate and inspire. Design advanced programmes for elite sportspeople, support performers at events and competitions  <a href="https://nationalcareers.service.gov.uk/job-profiles/sports-coach">https://nationalcareers.service.gov.uk/job-profiles/sports-coach</a></p> <p><b>Sports Commentator</b></p> <p>Research facts on performers, describe action as it happens, give updates on results and highlights. Take direction from the show's producer, interview sports professionals live or for recorded clips, provide online social media content  <a href="https://nationalcareers.service.gov.uk/job-profiles/sports-commentator">https://nationalcareers.service.gov.uk/job-profiles/sports-commentator</a></p> <p><b>Performance Sports Scientist</b></p> <p>Analyse training and competition data to identify areas for improvement, design development plans to improve individual and team performance. Help people improve their health through exercise and fitness, advise on the design and manufacture of sports equipment  <a href="https://nationalcareers.service.gov.uk/job-profiles/sports-scientist">https://nationalcareers.service.gov.uk/job-profiles/sports-scientist</a></p>	
2	Obese	weighing significantly more than expected. 30 BMI and above				
3	Over exertion	<b>Overexertion</b> can occur when you push yourself too hard physically and mentally				
4	Self esteem	how we value and perceive ourselves. It's based on our opinions and beliefs about ourselves, which can feel difficult to change.				
5	nutritionist	A nutritionist is a person whose job is to give advice on what you should eat to remain healthy.				
6	analyst	someone whose job is to study or examine something in detail				
7	Therapist	treats a particular type of mental or physical illness or disability, usually with a particular type of therapy. Speech therapist, Art Therapist, physiotherapist.				
					10 <b>School Values</b>	
					<p>RESPECT – understand every choices will be different to ours</p> <p>RESILIENCE – Positivity- try something new – get a now hobby</p> <p>ASPIRATION – build your self esteem – help others to improve yourself</p>	

# Year 11 Drama Autumn Term Knowledge Organiser

Key Vocabulary:			Component 2 & 3- Learning Aim A Developing ideas in response to a brief		Component 2 & 3 – Learning Aim C Contributing to a workshop performance	
1	Stage Levels	To show power, status or just different locations for the scenes.	8	<b>A1</b>	10	<b>C1 - Skills and Techniques</b>
2	Genre	Comedy, Thriller, Melo drama	<p><b>Target Audience:</b> What age and gender are you aiming your work?</p> <p><b>Performance Space:</b> Configuration-End on, Traverse, Thrust or in the round?</p> <p><b>Planning and managing resources:</b> What do we need? Props? Sound? Lighting? Research?</p> <p><b>Style of work:</b>  <b>Naturalistic:</b> Stanislavski  <b>Epic-Brecht</b>  <b>Melodrama</b> - Shakespeare</p>		<p>Skills may include:</p> <ul style="list-style-type: none"> <li>Vocal skills</li> <li>Physical skills</li> <li>Interpretative skills: showing time and place, presenting a character, creating humour or emotion.</li> <li>If performing, demonstrating and sustaining in performance the following skills: <ul style="list-style-type: none"> <li>energy o focus o concentration o commitment.</li> </ul> </li> <li>Responding to a stimulus</li> <li>Exploring and developing ideas</li> <li>Sharing ideas and intentions</li> <li>Teaching material to performers</li> <li>Refining and adjusting material</li> </ul>	
3	Creative Intentions	What was the director/ writer/ creator thinking about? Themes / issues / response to stimulus / style/genre / contextual influences / collaboration with other practitioners / influences by other practitioners.	<p><b>Starting points:</b> Using the given theme, issue, social background.</p> <p><b>Props/Costume:</b> Influence the work?</p> <p><b>Individual and group contribution:</b> What did you suggest?</p> <p><b>Period of time:</b> past, present or future?</p>		11	<b>C2 Working effectively with others</b>
4	Purpose	Why was it made? to educate / to inform / to entertain to provoke/ to challenge viewpoints / to raise awareness / to celebrate...	<p><b>9</b></p> <p><b>Learning Aim B1</b></p> <p><b>Selecting and developing skills and techniques in response to a brief</b></p>		<ul style="list-style-type: none"> <li>Communicating effectively with other performers: in preparation for performance (if performing) during performance.</li> <li>Taking part in final group preparations, which may include: o setting up/get in o get out/strike taking part in/contributing to a workshop performance.</li> </ul>	
5	Theme	The topic of the performance e.g. Conflict, Family	<p>Skills and techniques of the individual performer e.g. vocal, physical.</p> <ul style="list-style-type: none"> <li>Skills and techniques of the performers as a group e.g. comedy, improvisation.</li> <li>Skills and techniques of the designer e.g. understanding implications of selected performance skills and techniques in relation to design, research, shaping and refining ideas.</li> <li>The style and/or genre of the work being created e.g. street dance, physical theatre.</li> <li>The influence of selected practitioners e.g. Brecht and Stanislavski</li> <li>Appropriate skills for the target audience e.g. young children, the elderly.</li> <li>Taking part in skills development classes or workshops.</li> <li>Taking part in the rehearsal process, including individual preparation and group rehearsals.</li> </ul>		12	<b>C3 Communicating ideas through performance</b>
6	Stylistic Qualities	How a performance is structured – Musical, Inclusivity, Epic theatre - storytelling			<ul style="list-style-type: none"> <li>Taking part in/contributing towards a performance for an audience.</li> <li>Communicating ideas and intentions effectively to an audience.</li> <li>An explanation of creative intentions and processes</li> </ul>	
7	Processes used in development, rehearsal and performance	Responding to stimulus to generate ideas for performance material / exploring and developing ideas to develop material / discussion with performers / setting tasks for performers / sharing ideas and intentions / teaching material to performers / developing performance material / organising and running rehearsals / refining and adjusting material to make improvements / providing notes and/or feedback on improvements.			13	<b>D1 Evaluating the development process and performance;</b> •Contributing to initial ideas and exploring activities in response to: o the brief o the stimulus o contributions from other members of the group. •Contributing to the development process. • development and/or adaptation o application o individual strengths and areas for improvement o overall individual contribution to the group. <b>D2 Reflect on the outcome</b> o effectiveness of the response to the brief o individual strengths and areas for improvement o overall impact of the work of the group.



# Year 11 GCSE Religious Studies Spring Term Knowledge Organiser: Theme B Religion and Life

Key Vocabulary:			Theme B: Origins and Value of the Universe		Theme B: Origins and Value of Human Life	
1	Abortion	The deliberate ending of a pregnancy	1	<b>Creation</b>	5	<b>Social Views on Abortion</b>
2	Awe and Wonder	Sense of wonderment at nature; often linked to the feeling that God is involved/revealed through it	There are many different explanations for the creation of the universe. Currently the scientific theory is that of the Big Bang – that at a single point 14bn years ago matter started expanding. Some religious groups see this as the work of God, whilst others disagree and believe that God created the world in 6 days.		Abortion was legalised in the UK in 1967. Since then it has become a topic of discussion for many non-religious people, as access to abortion has remained restricted. We will look at the arguments for and against use of abortion.	
3	Big Bang Theory	Scientific theory about the origins of the universe; belief that the universe began almost 14 billion years ago with a reaction of particles from a singularity followed by a process of inflation and expansion	2	<b>Value of the World</b>	6	<b>Religious Views on Abortion</b>
4	Dominion	Belief that humans have been given control/charge of the world	Both religious and non-religious groups believe that we have a duty (responsibility) to look after the natural world. Non-religious people believe that the world is a valuable resource that should be treated with respect, as it does not belong to us but should be available for future generations.		Many religious groups, including Muslims and Christians believe in the sanctity of life – the idea that life is holy and belongs to God. For many religious people, they believe that life begins at conception and so abortion is the equivalent to murder. Others, including some Muslims, believe that a foetus does not get a soul until 120 days into a pregnancy, so abortion is acceptable.	
5	Euthanasia	Assisting with the ending of life for a person who is terminally ill or has degenerative illness; often known as assisted suicide	Religious people believe that the world is a gift from God, and therefore is very valuable. Muslims believe that we are all khalifahs – or stewards – who should look after creation on Allah’s behalf.		7	<b>Social Views on Euthanasia</b>
6	Evolution	Scientific theory of the development of species which involves a process of natural selection and survival of the fittest	3	<b>Use and Abuse of Environment</b>	Euthanasia remains illegal in the UK, despite many in society calling for it to be legalised. The view that people have autonomy (the right to make their own decision) states that we should be able to decide when to die. For many people, euthanasia is seen to allow people to die with dignity and to end pain. Others believe there is a significant risk that it will be abused, and innocent people will suffer.	
7	Quality of life	The standard of health, comfort and happiness/fulfillment experienced by a person or group	Pollution, global warming and emissions are rising. The way that humans use the environment is causing damage – in the form of water, air and land pollution. We will explore issues such as deforestation, factory and manufacturing pollution and issues around energy sources to explore how the environment is being used and abused by human beings.		8	<b>Religious Views on Euthanasia</b>
8	Sanctity of life	Belief that life is sacred/special because it was created by God	4	<b>Use of Animals and Animal Rights</b>	Due to belief in the sanctity of life, most religious groups believe that euthanasia is murder as it is taking life against God’s wishes. Some Christians believe that as Jesus suffered on the cross, we should take the opportunity to learn from suffering. Others believe that it is a form of agape to allow people to end their suffering, even if it does mean ending a life.	
9	Stewardship	Duty given by God to humankind to look after the created world, and all life within it.	There are different views on the rights of animals within society. Many people believe that whilst it is acceptable to use animals for food, they should not be experimented on and should be treated humanely (with respect). Some religious believers argue that God created animals for humans to use as they wish (dominion) and so they do not have equal rights to humans.		9	<b>Life After Death</b>
					There are many different views on what happens when we die. Christians and Muslims believe in Heaven and Hell, where we go after God has judged us. Some non-religious people believe in a ghostly or spirit afterlife, whilst others, including humanists, believe that death is the end and there is no afterlife.	

# Year 11 GCSE Spanish Autumn Term Knowledge Organiser ' Ciudades'

En la ciudad – In the city			
1.	En mi ciudad/pueblo hay... - In my city/town there is...	<b>un ayuntamiento</b> – a town hall <b>un bar/muchos bares</b> – a bar/lots of bars <b>un castillo (en ruinas)</b> – a (ruined) castle <b>un cine</b> – a cinema <b>un mercado</b> – a market <b>una piscina</b> – a swimming pool <b>un supermercado</b> – a supermarket <b>una playa</b> – a beach <b>un museo</b> – a museum <b>una plaza mayor</b> – a town square <b>un parque</b> – a park <b>una plaza de toros</b> – a bull ring <b>un polideportivo</b> – a sports centre	<b>una pista de hielo</b> – an ice rink <b>un puerto</b> – a port/harbour <b>una oficina de correos</b> – a post office <b>un restaurante</b> – a restaurant <b>una bolera</b> – a bowling alley <b>un teatro</b> – a theatre <b>una iglesia</b> – a church <b>una biblioteca</b> – a library <b>una comisería</b> – a police station <b>una estación de trenes/autobuses</b> – a train/bus station <b>un gran almacén</b> – a department store <b>un centro comercial</b> – a shopping centre <b>muchos lugares de interés</b> – lots of sights

Es una ciudad/un pueblo _____ - It's a _____ city/town	<b>histórico/a</b> – historic <b>moderno/a</b> – modern <b>tranquilo/a</b> – calm/quiet <b>ruidoso/a</b> – noisy <b>animado/a</b> – lively <b>aburrido/a</b> – boring <b>turístico</b> – touristy <b>industrial</b> – industrial <b>famoso/a</b> – famous <b>conocido/a por...</b> - known for...	Está situado – it's situated...	al lado del río – next to the river está rodeado de... - it's surrounded by
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Tiene unos impresionantes paisajes naturales – it has some amazing natural landscapes  
 Tiene varios influencias culturales – it has various cultural influences  
 Tiene el bullicio de la ciudad – it has the hustle and bustle of the city  
 Es mi ciudad natal – it's my home town  
 Hay mucho que hacer/hay mucha marcha – there's lots to do  
 No hay nada que hacer – there's nothing to do  
 Hay una zona peatonal – there's a pedestrian zone

Actividades - activities		
2.	Se puede(n)... - you can	<b>estar mucho tiempo al aire libre</b> – spend a lot of time in the open air <b>subir la torre</b> – go up the tower <b>hacer un recorrido en autobús</b> – do a bus tour <b>disfrutar de las vistas</b> – enjoy the views <b>apreciar la arquitectura variada</b> – appreciate the variety of the architecture <b>aprovechar del buen tiempo</b> – make the most of the good weather <b>probar platos típicos</b> – try local dishes <b>practicar deportes acuáticos</b> – do water sports <b>practicar senderismo</b> – go hiking/trekking <b>ir de compras</b> – go shopping

Tiendas - Shops			
3.	<b>Un estanco</b> – a tobacconist's <b>Un banco</b> – a bank	<b>Una papelería</b> – a stationery shop <b>Una pastelería</b> – a cake shop <b>Una peluquería</b> – a hairdresser's <b>Una pescadería</b> – a fishmonger's <b>Una tienda de ropa</b> – a clothes shop <b>Una zapatería</b> – a shoe shop <b>Una juguetería</b> – a toy shop <b>Una tienda de comestibles</b> – a grocery store/supermarket	<b>Una cafetería</b> – a café <b>Una carnicería</b> – a butcher's <b>Una farmacia</b> – a pharmacy/chemist's <b>Una frutería</b> – a greengrocer's <b>Una joyería</b> – a jeweller's <b>Una librería</b> – a bookshop <b>Una panadería</b> – a bakery

4. Parallel Text:		
1	Lo mejor de vivir en la ciudad es que	The best thing about living in the city is that
2	es <b>tan fácil desplazarse</b> ya que	it's <b>so easy to get around</b>
3	hay <b>una red de transporte público muy fiable.</b>	because there is <b>a really reliable public transport network.</b>
4	Además, <b>merece la pena madrugar</b> porque	Moreover, <b>it's worth getting up early</b> because
5	hay mucho que hacer.	There's a lot to do.
6	Hay <b>cines, tiendas y boleras</b> y	There are <b>cinemas, shops and bowling alleys</b> and
7	<b>mucha gente dice que la vida es más interesante.</b>	<b>lots of people say that life is more interesting.</b>
8	En mi opinión, se lleva una vida tan frenética en la ciudad	In my opinion life is so hectic in the city
9	y por eso, <b>preferiría vivir</b> en el campo.	therefore <b>I would prefer to live</b> in the countryside.
10	<b>Me parece que hay bastante desempleo</b>	<b>It seems that there is a lot of unemployment</b>
11	sin embargo la vida es <b>más tranquila</b> y	however life <b>is calmer</b> and
12	se puede aprovechar del aire libre.	you can enjoy the fresh air.
13	<b>Si fuera posible</b> cambiaría muchas cosas de mi ciudad.	<b>If it were possible</b> I would change a lot of things in my city.
14	Por ejemplo <b>reduciría la contaminación</b> y	For example I would <b>reduce pollution</b> and
15	<b>plantaría más árboles</b> ya que	<b>plant more trees</b> because
16	en el pasado era muy <b>industrial.</b>	in the past it was very <b>industrial.</b>

# Year 11 GCSE Spanish 'Ciudades'

Las ventajas y las desventajas – the advantages and disadvantages	
1.	<p><b>Lo mejor de vivir en la ciudad es que...</b> - the best thing about living in the city is that...</p> <p><b>es tan fácil desplazarse</b> – it’s so easy to get around</p> <p><b>hay una red de transporte público</b> – there’s a public transport network</p> <p><b>hay tantas diversiones</b> – there’s so much to do</p> <p><b>hay muchas posibilidades de trabajo</b> – there are lots of job opportunities</p> <p><b>la vida es más interesante</b> – life is more interesting</p>
	<p><b>Lo peor que que...</b> - the worst thing is that...</p> <p><b>el centro es tan ruidoso</b> – the centre is so noisy</p> <p><b>hay tanto tráfico</b> – there’s so much traffic</p> <p><b>se lleva una vida tan frenética</b> – life is so hectic</p> <p><b>la gente no se conoce</b> – people don’t know each other</p> <p><b>hay demasiado contaminación</b> – there’s too much pollution</p>
	<p><b>En el campo...</b> - in the countryside</p> <p><b>el transporte público no es fiable</b> – the public transport isn’t reliable</p> <p><b>hay bastante desempleo</b> – there’s quite a lot of unemployment</p> <p><b>yo conozco a todos mis vecinos</b> – I know all of my neighbours</p> <p><b>se puede aprovechar del aire libre</b> – you can enjoy the fresh air</p> <p><b>la vida es más tranquila</b> – life is calmer</p> <p><b>la vida es más aburrida</b> – life is more boring</p>

Cambios - changes	
2.	<p><b>Si fuera posible</b> – if it were possible</p> <p><b>introduciría transporte público gratis</b> – I would introduce free public transport</p> <p><b>renovaría los edificios viejos</b> – I would renovate the old buildings</p> <p><b>mejoraría el sistema de transporte público</b> – I would improve the public transport system</p> <p><b>crearía más trabajos</b> – I would create more jobs</p> <p><b>crearía más espacios verdes</b> – I would create more green spaces</p> <p><b>invertiría en la educación</b> – I would invest in education</p> <p><b>plantaría más árboles</b> – I would plant more trees</p> <p><b>constuiría más tiendas en el centro</b> – I would build more shops in the centre</p> <p><b>reduciría la contaminación</b> – I would reduce pollution</p> <p><b>prohibiría los coches</b> – I would ban cars</p>

Mi ciudad en el pasado – my city in the past				
3.	<p><b>En el pasado</b> – in the past</p> <p><b>Hace (10) años</b> – 10 years ago</p> <p><b>En los años sesenta</b> – in the 60s</p> <p><b>Mis padres/mis abuelos dicen que</b> – my parents/grandparents say that...</p>	<p><b>la ciudad era</b> – the city was</p> <p><b>había</b> – there was</p> <p><b>tenía</b> – it had</p>	<p><b>más/menos que hacer</b> – more/less to do</p> <p><b>mucho desempleo</b> – there was a lot of unemployment</p> <p><b>más/menos pobreza</b> – more/less poverty</p> <p><b>más/menos industrial</b> – more/less industrial</p> <p><b>un puerto importante</b> – an important port</p>	<p><b>los Beatles se volvían famosos</b> – the Beatles became famous</p> <p><b>Liverpool era la capital de cultura durante el año dos mil ocho (2008)</b> – Liverpool was the Capital of Culture in 2008</p> <p><b>la ciudad ha cambiado a lo largo de los siglos</b> – the city has changed throughout the centuries</p>

# RSHS KS4 PE Knowledge Organiser BTEC Tech Award in Sport

## Component 2: Preparing Participants to Take Part in Sport and Physical Activity



Key Vocabulary:			Learning Aim A: Understand How Different Components of Fitness are Used in Different Physical Activities			
1	<b>Components of Physical Fitness</b>	Aerobic Endurance Muscular Endurance Muscular Strength Speed Flexibility Body Composition	7	<b>Components of Fitness</b>	11	<b>Regulations</b>
			In order to be successful in their chosen sport performers need high levels of fitness. The most important components for each sport will vary for example footballers require high levels of endurance, speed, coordination and agility, whereas gymnasts require high levels of flexibility, strength and balance.			
2	<b>Components of Skill-Related Fitness</b>	Power Agility Reaction Time Balance Co-ordination	8	<b>Examples in sport</b>	12	<b>Learning Aim C: Sports Leadership</b>
			<b>Basketball</b> – a basketballer will need high levels of power to out jump an opponent to win a rebound. <b>Badminton</b> – a badminton player will need high levels of muscular endurance in the racket arm to keep hitting the shuttle with control. <b>Boxing</b> – a boxer will need high levels of reaction time to dodge and block punches .			
3	<b>Rules and Regulations</b>	All types of sports have set rules and regulations which form the official way in which the game should be set up and played.	<b>Physical Fitness activities</b>		<ul style="list-style-type: none"> <li>• Isolated practices</li> <li>• Conditioned practices</li> </ul> <p style="text-align: center;"><u>Demonstrations</u></p> <ul style="list-style-type: none"> <li>• Use of Self</li> <li>• Use of Peer</li> </ul> <ul style="list-style-type: none"> <li>• Positioning to Ensure Everyone Can See</li> </ul> <p style="text-align: center;"><u>Teaching Points</u></p> <ul style="list-style-type: none"> <li>• Giving safety points</li> <li>• Giving Key technique points</li> <li>• Observe performance of key points</li> <li>• Correcting errors in performance</li> </ul>	
			<b>Learning Aim B: Be able to Participate in Sport</b>			
4	<b>Officials</b>	Officials in sport are responsible for making sure that competitive fixtures are carried out within the rules and regulations .	9	<b>Officials in Sport</b>	13	<b>Drills to Improve Sporting Performance</b>
			<b>Roles</b> <ul style="list-style-type: none"> <li>• Referee/ Umpire</li> <li>• Assistant Referee/Line Umpire</li> <li>• Scorer/ Judge</li> <li>• Time Keeper</li> <li>• Video Review Official</li> </ul> <b>Responsibilities</b> <ul style="list-style-type: none"> <li>• Appearance Equipment</li> <li>• Fitness Requirements</li> <li>• Effective Communication</li> <li>• Control of Players</li> <li>• Health and Safety</li> </ul>			
5	<b>Isolated Practices</b>	Drills Used to Improve Specific Techniques in Different Sports	<b>Rules</b>		*Organisation  •Space  •Equipment  •Organisation of Participants  •Timing  •Demonstrations •Positioning	
			These determine what players can and can't do during play such as misconduct and types of fouls.  Sanctions are what players will receive dependent on the level of misconduct or foul play such as a booking/warning or being sent off.			
6	<b>Conditioned Practices</b>	Conditioned games/practices using modifications such as playing area, number of players or rule changes to focus on a specific skill.	<b>Rules</b>		Supporting Participants in Drills and Conditioned Practices  •Observing Participants  •Providing Instructions  •Providing Teaching Points  •Providing Feedback to Participants	
			These determine what players can and can't do during play such as misconduct and types of fouls.  Sanctions are what players will receive dependent on the level of misconduct or foul play such as a booking/warning or being sent off.			

# Year 11 Mathematics – Knowledge Organiser – Probability – Autumn Term

## Key Vocabulary

1	Probability	The chance that something happens. How likely it is that some event will occur.
2	Event	One or more outcomes from an experiment.
3	Outcome	The result of an experiment.
4	Intersection	Elements (parts) that are common to both sets.
5	Union	The combination of elements in two sets.
6	Expected Value	The value/outcome that a prediction would suggest you will get.
7	Universal Set	The set that has all the elements.
8	Independent	In probability, two events are independent if knowing one event occurred doesn't change the probability of the other event.
9	Product	The answer when two or more values are multiplied together.

## 10 Add, Subtract and Multiply Fractions

### Addition and Subtraction

$$\left(\frac{4}{5} - \frac{2}{3}\right) = \frac{12}{15} - \frac{10}{15} = \frac{2}{15}$$

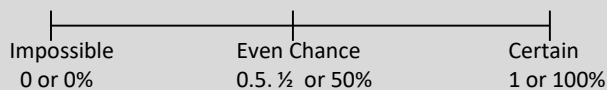
Use equivalent fractions to find a common multiple for both denominators.

### Multiplication

$$\frac{4}{5} \times \frac{2}{3} = \frac{8}{15}$$

Multiply the numerators and multiply the denominators.

## 11 Likelihood of a Probability



The more likely an event, the further up the probability it will be in comparison to another event – it will have a probability closer to 1.

## 12 Sum to One

Probability is always a value between 0 and 1.

Example: A bag contains 2 red beads, 2 yellow beads and 1 blue bead.

The probability of getting a blue bead is  $\frac{1}{5}$

Therefore, the probability of NOT getting a blue bead is  $\frac{4}{5}$

The sum of probabilities is ONE.

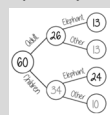
## 13 Tables, Venn Diagrams and Frequency Trees

E.g. 60 people visited the zoo one day. 13 of the 26 adults said their favourite animal was an elephant. 24 of the children's favourite animal was an elephant.

### Two-way Table

	Adult	Child	Total
Elephant	13	24	37
Other	13	10	23
Total	26	34	60

### Frequency Trees



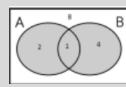
Frequency trees and two-way tables can show the same information.

$$P(\text{adult}) = \frac{26}{60}$$

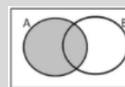
### Venn Diagram



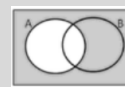
In set A  
AND set B  
 $P(A \cap B)$



In set A  
OR set B  
 $P(A \cup B)$



In set A  
 $P(A)$



NOT in set A  
 $P(A')$

## 14 Experimental Data

**Theoretical Probability** - what we expect to happen.  
**Experimental Probability** - what actually happens when we try it out.

The probability becomes more accurate with more trials.  
Theoretical probability is proportional.

## 15 Sample Space

Example: What are the possible outcomes from rolling a dice and flipping a coin?

The possible outcomes from rolling a dice.

The possible outcomes from flipping a coin.

	1	2	3	4	5	6
H	1H	2H	3H	4H	5H	6H
T	1T	2T	3T	4T	5T	6T

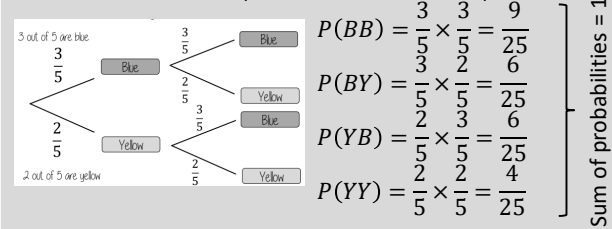
$$P(\text{Even Number and Tails}) = \frac{3}{12}$$

## 16 Independent Events

The outcome of two events happening. The outcome of the first event has no bearing on the outcome of the other.

$$P(A \text{ and } B) = P(A) \times P(B)$$

Example: Jenny has a bag with 3 blue counters and 2 yellow. She picks a counter at random and replaces it before the second pick.



$$\begin{aligned} P(BB) &= \frac{3}{5} \times \frac{3}{5} = \frac{9}{25} \\ P(BY) &= \frac{3}{5} \times \frac{2}{5} = \frac{6}{25} \\ P(YB) &= \frac{2}{5} \times \frac{3}{5} = \frac{6}{25} \\ P(YY) &= \frac{2}{5} \times \frac{2}{5} = \frac{4}{25} \end{aligned}$$

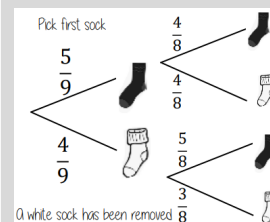
Sum of probabilities = 1

## 17 Dependent Events

The outcome of the first event has an impact on the second event.

Example: A sock drawer has 5 black socks and 4 white socks. Jamie picks 2 socks from the drawer.

NOTE: as "socks" are removed from the drawer, the number of socks reduces  $\therefore$  the denominator is reduced for the second pick.



$$\begin{aligned} P(BB) &= \frac{5}{9} \times \frac{4}{8} = \frac{20}{72} \\ P(BW) &= \frac{5}{9} \times \frac{4}{8} = \frac{20}{72} \\ P(WB) &= \frac{4}{9} \times \frac{5}{8} = \frac{20}{72} \\ P(WW) &= \frac{4}{9} \times \frac{3}{8} = \frac{12}{72} \end{aligned}$$

Sum of probabilities = 1

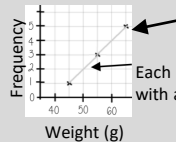
# Year 11 Mathematics – Knowledge Organiser – Collecting, Representing and Interpreting Data – Autumn Term

## Key Vocabulary

1	Population	The whole group that is being studied.
2	Sample	A selection taken from the population that will let you find out information about the larger group.
3	Representative	A sample group that accurately represents the population.
4	Random Sample	A group completely chosen by chance. No predictability to who it will include.
5	Bias	A built-in error that makes all values wrong by a certain value.
6	Correlation	The relationship between two variables.
7	Primary Data	Data collected from an original source for a purpose.
8	Secondary Data	Data taken from an external location. Not collected directly.
9	Outlier	A value that stands apart from the data set.

## 10 Frequency Tables and Polygons

x Weight(g)	Frequency
$40 < x \leq 50$	1
$50 < x \leq 60$	3
$60 < x \leq 70$	5



Each point is plotted at the midpoint.

Each point is connected with a straight line.

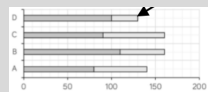
We do not know from grouped data where each value is placed so we use an estimate for calculations.

Midpoints are used as estimated values for grouped data. The middle of each group.

## 11 Bar Charts and Line Charts

### Composite bar charts

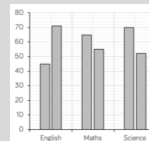
Compare the bars – the size of each bar is the frequency. Overall total easily comparable.



Use a key

### Dual bar charts

Bars are compared side by side. Easier to compare subgroups.



Use a key

## 12 Stem and Leaf Diagrams

A way to represent data and is used to find averages.

This stem and leaf diagram shows the ages of people in a line at the supermarket.

0	7	9		
1	4	5	6	8
2	1	3		
3	0			

Key: 1 | 4 means 14 years old.

*Stem and leaf diagrams MUST include a key to explain what it represents. The information in the diagram MUST be ordered.*

### Back-to-back Stem and Leaf diagrams

	Girls	Boys
5	14	
7, 5, 5, 5, 4	15	3, 8, 9
8, 4, 2, 1, 0	16	2, 5, 7, 7, 8, 8, 9
8, 7, 6, 6, 4, 2, 1, 1, 0, 0	17	0, 2, 3, 6, 6, 7, 7
	18	0, 1, 4, 5

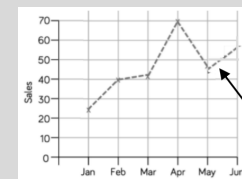
Key: 15 | 3 means 153 cm tall

Allows comparisons of similar groups.

Allows representations of two sets of data.

## 13 Time-Series

E.g. This time-series graph shows the total number of car sales in £1000 over time.



Look for general trends in the data. Some data shows a clear increase or decrease over time.

Readings in-between points are estimates (on the dotted lines). You can use them to make assumptions.

## 14 Comparing Distributions

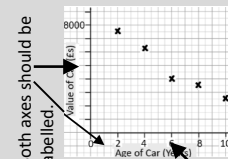
Comparisons should include a statement of average and central tendency, as well as a statement about spread and consistency.

Mean, mode, median – allows for a comparison about more or less average.

Range – allows for a comparison about reliability and consistency of data.

## 15 Draw and Interpret a Scatter Graph

Age of Car (Years)	2	4	6	8	10
Value of Car (£)	7500	6250	4000	3500	2500



Both axes should be labelled.

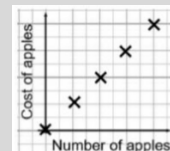
The axis should fit all the values on and be equally spaced out.

This data may not be given in size order. The data forms information pairs for the scatter graph.

Not all data has a relationship.

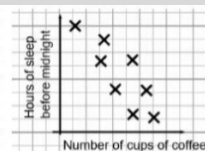
*This scatter graph shows: as the age of the car increases, the value decreases.*

## 16 Linear Correlation



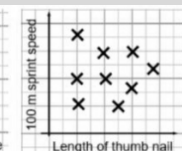
Positive Correlation

As one variable increases so does the other variable.



Negative Correlation

As one variable increases the other variable decreases.

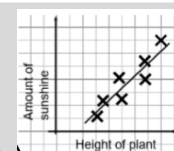


No Correlation

There is no relationship between the two variables.

## 17 The Line of Best Fit

The Line of Best Fit is used to make estimates about the information in your scatter graph.



Things to know:

1. The line of best fit **DOES NOT** need to go through the origin.
2. There should be approximately the same number of points above and below the line.
3. The line extends across all of the graph within the data given.

It is only an estimate because the line is designed to be an average representation of the data.

It is always a **STRAIGHT LINE**.

# Year 11 Mathematics – Knowledge Organiser – Non-Calculator Methods – Autumn Term

## Key Vocabulary

1	Integer	A whole number.
2	Decimal	A number that uses a decimal point followed by digits that show a value smaller than one. E.g. 45.6 is a decimal number.
3	Exact	An answer that has not been rounded. Often used with surds or Pi ( $\pi$ ).
4	Truncate	To shorten a number (without rounding).
5	Round	Making a number simpler but keeping its place value close to what it originally was.
6	Credit	The money that goes into a bank account.
7	Debit	The money that leaves a bank account.
8	Profit	The amount of money after costs have been deducted.
9	Tax	Money that the government collects based on income, sales and other activities.

## 10 Addition and Subtraction

	H	T	O
	1	8	7
+	5	4	2

Addition is commutative.

The order of addition does not change the result.

Decimals have the same methods – remember to align the place value.

	H	T	O
	4	2	7
-	2	4	9

Subtraction – the order has to stay the same.

Remember the place value of each column. You may need to move 10 ones to the ones column to be able to subtract.

## 11 Division Methods

Short division

$$3584 \div 7 = 512$$

$$\begin{array}{r} 512 \\ 7 \overline{) 3584} \end{array}$$

Division with decimals

The place holder in division methods is essential – the decimal lines up on the dividend and the quotient.

$$2.4 \div 0.02 \rightarrow 24 \div 0.2 \rightarrow 240 \div 2$$

All give the same solution as they represent the same proportion. Multiply the values in proportion until the divisor becomes an integer.

Complex division

Break up the division using factors.

$$\div 24 = \div 6 \div 4$$

## 12 Multiplication Methods

	H	T	O
	1	8	7
x			9

Long multiplication (column)

	x	100	80	7

Grid method

8	7
1	6
1	4
3	2
2	8

Chinese lattice

1	8	7
1	8	7
1	8	7
1	8	7
1	8	7
1	8	7
1	8	7
1	8	7

Repeated addition

Less effective method – especially for bigger multiplication.

Multiplication with decimals

Either perform multiplications as integers e.g.  $0.2 \times 0.3 \rightarrow 2 \times 3$ . Then make adjustments to your answer to match the question:  $0.2 \times 10 = 2$  and  $0.3 \times 10 = 3$ . Therefore  $6 \div 100 = 0.06$ .

Or use a Chinese lattice and do the decimal slide with the decimal point. Check your answer by estimating the calculation.

3	1	7	x
1	6	1	4
1	4	2	8
3	2	8	
3	8	6	

## 13 Four Operations with Fractions

Addition and Subtraction  
Remember they must have a common denominator – use equivalent fractions.

$$4 \frac{2}{3} - \frac{12}{15} = \frac{10}{3} - \frac{12}{15} = \frac{10}{3} - \frac{4}{5} = \frac{50}{15} - \frac{12}{15} = \frac{38}{15}$$

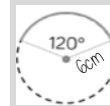

Multiplication

$$\frac{3}{4} \times \frac{2}{3} = \frac{6}{12} = \frac{1}{2}$$


Division  
 $\frac{2}{3} \div \frac{4}{5} = \frac{2}{3} \times \frac{5}{4} = \frac{5}{6}$   
Dividing fractions is the same as multiplying by the reciprocal.

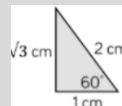
## 14 Exact Values

Exact Values answers can be to leave your answer in terms of Pi ( $\pi$ ).



$$\begin{aligned} &= \frac{120}{360} \times 12\pi \\ &= \frac{1}{3} \times 12\pi = 4\pi \end{aligned}$$

Or Exact Values answers can be to leave your answer as a surd.



$$\tan 30 = \frac{1}{\sqrt{3}}$$

## 15 Estimation

Round to 1 significant figure to estimate.

$$21.4 \times 3.1 \approx 20 \times 3 \approx 60$$

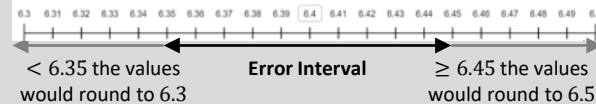
The equals sign changes to show it is an estimation.

*This is an underestimate because both values were rounded down.*

It is good to check all calculations with an estimate in all aspects of maths – it helps you identify calculation errors.

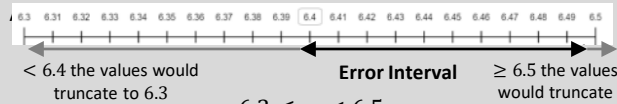
## 16 Limits of Accuracy

A width  $w$  has been rounded to 6.4 cm correct to 1 d.p.



The Error Interval  $6.35 \leq w < 6.45$

Any value within these limits would round to 6.4 to 1 d.p.



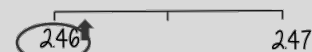
Any value within these limits would truncate to 6.4 to 1 d.p.

## 17 Rounding

Round to 2 d.p. 2.46192  
Is this closer to 2.46 or 2.47?

2.46192

This shows the number is closer to 2.46.



Significant Figures

870 to 1 significant figure is 900  
87 to 1 significant figure is 90  
8.7 to 1 significant figure is 9  
0.87 to 1 significant figure is 0.9  
0.0000087 to 1 significant figure is 0.000009

Significant Figures – round to the first non-zero number.

# Year 11 Mathematics – Knowledge Organiser – Types of Number and Sequences – Autumn Term

Key Vocabulary		
1	Factor	Numbers we multiply together to make another number.
2	Multiple	The result of multiplying a number by an integer.
3	Prime Number	A number which has exactly two factors, one and itself.
4	LCM	Lowest Common Multiple (LCM) The smallest/first multiple that numbers share.
5	HCF	Highest Common Factor (HCF) The biggest factor that numbers share.
6	Arithmetic	A sequence where the difference between terms is constant.
7	Geometric	A sequence where each term is found by multiplying the previous one by a fixed non-zero number.
8	Sequence	Items or numbers put in a pre-decided order.
9	Nth Term	The rule used to describe a sequence.


**10 Multiples**


The "times tables" of a given number.  
All the numbers in the lists below are multiples of 3.  
3, 6, 9, 12, 15 ....      $3x, 6x, 9x, \dots$

This list continues and doesn't end.  
Non-example of a multiple  
4.5 is not a multiple of 3 because it is  $3 \times 1.5$  ← Not an integer.

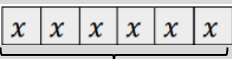
*x could take any value and as the variable is a multiple of 3 the answer will also be a multiple of 3.*

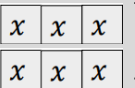
**11 Factors**

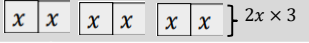
Arrays can help represent factors.   $1 \times 10$  or  $10 \times 1$

 E.g. Factors of 10 are 1, 2, 5, 10  
 $5 \times 2$  or  $2 \times 5$

Factors and expressions  
Factors of  $6x$  are  $6, x, 1, 6x, 2x, 3, 3x, 2$

  $6x \times 1$  or  $6 \times x$

  $3x \times 2$

  $2x \times 3$

**12 Prime Numbers**

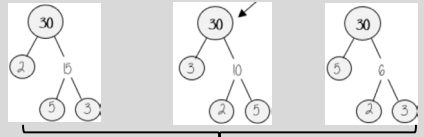
Prime numbers:

- Integer
- Only has two factors
- One and itself
- Two is the first prime number
- Two is the only even prime number

Learn these...  
2, 3, 5, 7, 11, 13, 17, 19, 23, 29, ...

**13 Product of Prime Factors**

Prime factor trees are multiplication part-whole models.

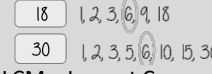


All three prime factor trees represent the same decomposition.  
 $30 = 2 \times 3 \times 5$  ← Multiplication of prime factors – also known as the product of prime factors.

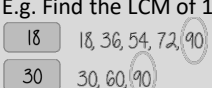
We can use prime factors for predictions:  
e.g.  $60 = 30 \times 2$       $2 \times 3 \times 5 \times 2$   
 $150 = 30 \times 5$       $2 \times 3 \times 5 \times 5$

**14 Finding the HCF and LCM**

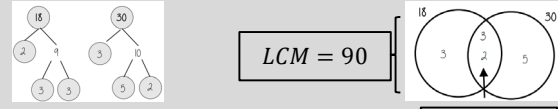
HCF – Highest Common Factor  
E.g. Find the HCF of 18 and 30

 6 is the biggest factor they share. **HCF = 6**

LCM – Lowest Common Multiple  
E.g. Find the LCM of 18 and 30

 The first time their multiples match is 90. **LCM = 90**

Using Venn diagrams

 **LCM = 90** **HCF = 6**

Use prime factor decomposition and complete a Venn diagram with prime factors.

**15 Arithmetic/Geometric Sequences**

Arithmetic sequences change by a common difference. This is found by addition or subtraction between terms.

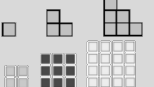
Geometric sequences change by a common ratio. This is found by multiplication/division between terms.


Term to term rule – how you get from one term (number in the sequence) to another.

Position to term rule – take the rule and substitute in a position to find a term. E.g. for  $3n + 2$ , multiply the position number by 3 and then add 2.

**16 Other Sequences**

Fibonacci Sequence: 1, 1, 2, 3, 5, 8, ... *Each term is the sum of the previous two terms.*

Triangular Numbers: 1, 3, 6, 10, 15, ... 

Square Numbers: 1, 4, 9, 16, ... 

Sequences are the repetition of a pattern.

**17 Finding the Nth Term**

This is the 4 times table.  $\longrightarrow$  4, 8, 12, 16, 20, ...


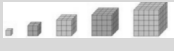




This has the same constant difference – but is 3 more than the original sequence.  $\downarrow \downarrow$   
7, 11, 15, 19, 22

*This is the constant difference between the terms.*  $\longrightarrow 4n + 3$  *This is the comparison (difference) between the original and the new sequence.*



# Year 11 Mathematics – Knowledge Organiser – Indices and Roots – Autumn Term

Key Vocabulary		
1	Indices	The power or the exponent.
2	Base	The number that gets multiplied by a power.
3	Power	The exponent – or the number that tells you how many times to use the number in multiplication.
4	Exponent	The power – or the number that tells you how many times to use the number in multiplication.
5	Coefficient	The number used to multiply a variable.
6	Negative	A value below zero.
7	Standard Form	Also known as Standard Index Form. A system of writing very big or very small numbers.
8	Commutative	An operation is commutative if changing the order does not change the result.
9	Fractional	When the power/exponent is not an integer.

10	<b>Square and Cube Numbers</b>
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p><u>Square numbers</u></p>  <p>1, 4, 9, 16...</p> </div> <div style="width: 45%;"> <p><u>Cube numbers</u></p>  <p>1, 8, 27, 64, 125...</p> </div> </div>	
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <math>\sqrt{144} = 12</math> </div> <div style="text-align: center;">  <math>\sqrt[3]{216} = 6</math> </div> </div>	
11	<b>Higher Powers and Roots</b>
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <math>x^n</math>              ← <math>n</math> – power (number of times multiplied by itself.)              ↑  <math>x</math> – the base number.         </div> <div style="text-align: center;">  <math>\sqrt[n]{x}</math>              ← Finding the <math>n</math>th root of any number.         </div> </div>	
<p><u>Other mental strategies for square roots:</u></p> $\sqrt{810000} = \sqrt{81} \times \sqrt{10000}$ $= 9 \times 100 = 900$	
12	<b>Addition and Subtraction Laws</b>
<div style="border: 1px solid black; padding: 10px; width: fit-content; margin: auto;"> <math>a^m \times a^n = a^{m+n}</math> </div>	
<div style="border: 1px solid black; padding: 10px; width: fit-content; margin: auto;"> <math>a^m \div a^n = a^{m-n}</math> </div>	
13	<b>Standard Form</b>
<p>Any number between 1 and less than 10. → <math>A \times 10^n</math> ← Any integer.</p>	
<p>Example: <math>3.2 \times 10^4</math>  <math>= 3.2 \times 10 \times 10 \times 10 \times 10</math>  <math>= 32000</math></p>	
<p>Non-example: <math>0.8 \times 10^4</math>  <math>5.3 \times 10^{0.7}</math></p>	
<p>Numbers in standard form with negative powers will be less than 1.</p>	
<p>Example:  <math>3.2 \times 10^{-4}</math>  <math>= 3.2 \times \frac{1}{10} \times \frac{1}{10} \times \frac{1}{10} \times \frac{1}{10}</math>  <math>= 0.00032</math></p>	
<div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;"> <p><i>Remember – negative powers do not mean negative solutions!</i></p> </div>	

14	<b>Zero and Negative Indices</b>
<div style="border: 1px solid black; padding: 10px; width: fit-content; margin: auto;"> <math>x^0 = 1</math> </div>	
<p>Any number divided by itself is 1.</p> $\left\{ \begin{aligned} \frac{a^6}{a^6} &= a^6 \div a^6 \\ &= a^{6-6} = a^0 = 1 \end{aligned} \right.$	
<p><i>Negative powers do not mean negative solutions!</i></p>	
<div style="display: flex; justify-content: space-between;"> <div style="width: 40%;"> <math>2^2 = 4</math>  <math>2^1 = 2</math>  <math>2^0 = 1</math>  <math>2^{-1} = \frac{1}{2}</math>  <math>2^{-2} = \frac{1}{4}</math> </div> <div style="width: 55%;"> <p>Looking at the sequence can help us to understand negative powers.</p> </div> </div>	
15	<b>Powers of Powers</b>
<div style="border: 1px solid black; padding: 10px; width: fit-content; margin: auto;"> <math>(x^a)^b = x^{ab}</math> </div>	
$(2^3)^4 = \underbrace{2^3 \times 2^3 \times 2^3 \times 2^3}_{16}$	
<p>The same base and power is repeated.              Use the addition law for indices.</p>	
$(2^3)^4 = 2^{12}$ ← $a \times b = 3 \times 4 = 12$	
<p>NOTICE the difference:  <math>(2x^3)^4 = \underbrace{2x^3 \times 2x^3 \times 2x^3 \times 2x^3}_{16x^{12}}</math></p>	
<p>The addition law applies ONLY to the powers. The integers still need to be multiplied.</p>	
$(2x^3)^4 = 16x^{12}$	
16	<b>Standard Form Calculations</b>
<p><u>Addition and subtraction</u></p>	
$\begin{aligned} 6 \times 10^5 + 8 \times 10^5 \\ &= 600000 + 800000 \\ &= 1400000 \\ &= 1.4 \times 10^5 \end{aligned}$	
<div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p><i>TIP – convert into ordinary numbers first and back to standard form at the end.</i></p> </div>	
<p><u>Multiplication and division</u></p>	
$\begin{aligned} \frac{1.5 \times 10^5}{0.3 \times 10^3} \\ &= (1.5 \times 10^5) \div (0.3 \times 10^3) \\ &= 1.5 \div 0.3 \times 10^5 \div 10^3 \\ &= 5 \times 10^2 \end{aligned}$	
<div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p><i>For multiplication and division, you can look at the values for A and the powers of 10 as two separate calculations.</i></p> </div>	

# Year 11 Mathematics – Knowledge Organiser – Manipulating Expressions – Autumn Term

## Key Vocabulary

**1 Expression**  
Numbers, symbols and operators (e.g. + and x) grouped together with a minimum of two terms and one maths operation. An expression does not have any of these: =, ≠, <, >, ≤, ≥

**2 Identity**  
An equation where both sides have variables that cause the same answer. It may include the symbol ≡

**3 Algebraic Fraction**  
A fraction which has an algebraic expression in either/or both the numerator and denominator.

**4 Equation**  
An equation says that two things are equal. It will always have an equals sign =

**5 Inequalities**  
An inequality compares two values, showing if one is less than, greater than, or equal to another.

**6 Coefficient**  
The number used to multiply a variable.

**7 Denominator**  
The bottom number or expression in a fraction.

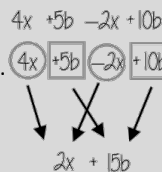
**8 Numerator**  
The top number or expression in a fraction.

**9 Reciprocal**  
A pair of numbers that multiply to give one.

## 10 Simplify Algebraic Expressions

Collect 'like terms.'

The ≡ symbol means equivalent to. It is used to identify equivalent expressions. Only **like terms** can be combined.



Check any powers are the same before collecting together. For example,  $x$  and  $x^2$  are not like terms.

## 11 Identities

An equation that is true for all values of the variables.

An identity uses the symbol ≡

Examples:

$$2x \equiv x + x$$

Check equivalence by substitution.

E.g.  $m = 10$

$5m$	$2 \times 2m$	$7m - 3m$
$5 \times 10$	$2 \times (2 \times 10)$	$(7 \times 10) - (3 \times 10)$
$= 50$	$= 2 \times 20$	$= 70 - 30$
	$= 40$	$= 40$
	Equivalent expressions.	

## 12 Solve Equations with Fractions

Remember when solving equations to do the same to both sides. To eliminate a denominator, multiply every term by the denominator.

Example:

$$\begin{aligned} \times 2 \quad \left( \frac{x+3}{2} = 4 \right) \quad \times 2 \\ \hline x+3 = 8 \\ -3 \quad \left( \right) \quad -3 \\ \hline x = 5 \end{aligned}$$

## 13 Solve Inequalities with Fractions

When solving inequalities, treat them as equations and remember to do the same to both sides. To eliminate a denominator, multiply every term by the denominator. Always include the inequality sign in your answer.

Example:

$$\begin{aligned} \times 2 \quad \left( \frac{x+3}{2} > 4 \right) \quad \times 2 \\ \hline x+3 > 8 \\ -3 \quad \left( \right) \quad -3 \\ \hline x > 5 \end{aligned}$$

## 14 Add and Subtract Algebraic Fractions

For fractions in the form:

$$\frac{a}{b} \pm \frac{c}{d} \quad \text{the common denominator is } bd.$$

$$\frac{a}{b} \pm \frac{c}{d} = \frac{ad}{bd} \pm \frac{bc}{bd} = \frac{ad \pm bc}{bd}$$

Example:

$$\begin{aligned} \frac{1}{x} + \frac{x}{2y} \\ = \frac{1(2y)}{2xy} + \frac{x(x)}{2xy} \\ = \frac{2y + x^2}{2xy} \end{aligned}$$

## 15 Multiply Algebraic Fractions

For fractions in the form:  $\frac{a}{b} \times \frac{c}{d}$

Multiply the numerators together and the denominators together. Remember to simplify where appropriate.

$$\frac{a}{b} \times \frac{c}{d} = \frac{ac}{bd}$$

Example:

$$\begin{aligned} \frac{x}{3} \times \frac{x+2}{x-2} \\ = \frac{x(x+2)}{3(x-2)} \\ = \frac{x^2 + 2x}{3x - 6} \end{aligned}$$

## 16 Divide Algebraic Fractions

For fractions in the form:  $\frac{a}{b} \div \frac{c}{d}$

Multiply the first fraction by the reciprocal of the second fraction. Remember to simplify where appropriate.

$$\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \times \frac{d}{c} = \frac{ad}{bc}$$

Example:

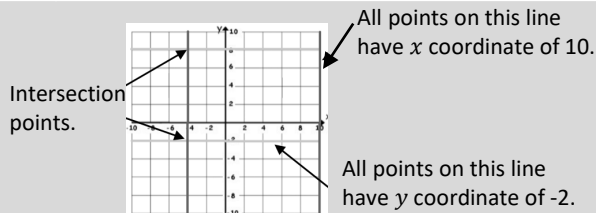
$$\begin{aligned} \frac{x}{3} \div \frac{2x}{7} \\ = \frac{x}{3} \times \frac{7}{2x} \\ = \frac{7x}{6x} = \frac{7}{6} \end{aligned}$$

# Year 11 Mathematics – Knowledge Organiser – Gradients and Lines – Autumn Term

## Key Vocabulary

1	Linear	Linear graphs (straight line) have common difference by addition or subtraction.
2	Gradient	The steepness of a line.
3	y – intercept	Where a line crosses the y – axis.
4	Coordinates	A set of values that show an exact position.
5	Substitute	Replace one variable with a number or a new variable.
6	Parallel	Lines that never meet with the same gradient.
7	Perpendicular	Two lines that meet at a right angle.
8	Reciprocal	A pair of numbers that multiply to give one.
9	Negative Reciprocal	A pair of numbers that multiply to give negative one.

## 10 Lines Parallel to the Axes



Lines parallel to the **x axis** take the form  $y = a$  and are **horizontal**.

Lines parallel to the **y axis** take the form  $x = a$  and are **vertical**.

'a' can be ANY positive or negative value including 0.

## 11 Completing a Table of Values

Substitute the  $x$  value into the equation of the line to generate the  $y$  value.

Example:

$$y = 3x - 1$$

Take the  $x$  value  $\rightarrow$  multiply by 3  $\rightarrow$  then  $-1$

Complete the table.

$x$	-3	-2	-1	0	1	2	3
$y$	-10	-7	-4	-1	2	5	8

This represents the coordinate pair (3, 8)

## 12 Plotting $y = mx + c$ Graphs

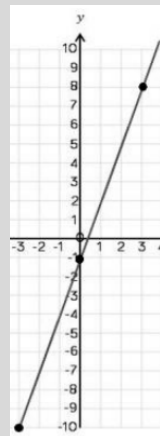
Plot the points using a pencil – they should form a straight line. This will help you to check that your calculations are correct.

Remember to join the points with a straight line using a ruler!

Example:

$$y = 3x - 1$$

(Using the table of values from above.)



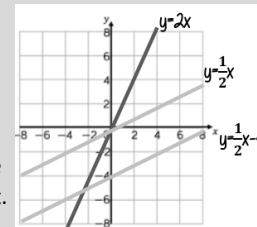
## 13 Using $y = mx + c$

$y = mx + c$

Compare Gradients  
The **coefficient of  $x$**  (the number in front of  $x$ ) tells us the gradient of the line.

The **greater** the gradient – the steeper the line.

**Parallel** lines have the **same** gradient.



Positive gradients.

Negative gradients.

$$y = mx + c$$

Compare Intercepts

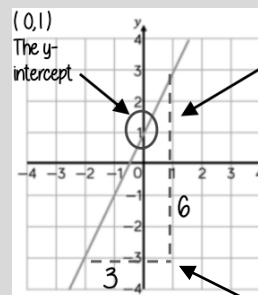
The coordinate of a  $y$  – intercept will always be  $(0, c)$ .

The value of  $c$  is the point at which the line crosses the  $y$  – axis. This is the  $y$  – intercept.

Lines with the **same**  $y$  – intercept cross in the **same** place.

$y = mx + c$   
 $x$  and  $y$  are **coordinates**.

## 14 Find the Equation from a Graph



Gradient  $y = 2x + 1$

$$\frac{6}{3} = 2$$

Find the gradient by calculating the

$\frac{\text{change in } y}{\text{change in } x}$  also known as  $\frac{\text{rise}}{\text{run}}$

The  $y$  – intercept is the point the graph crosses the  $y$  – axis.

Try finding a “nice” triangle (with lines that go through points that are easy to read) on the graph to help you calculate the change in  $y$  and the change in  $x$ .