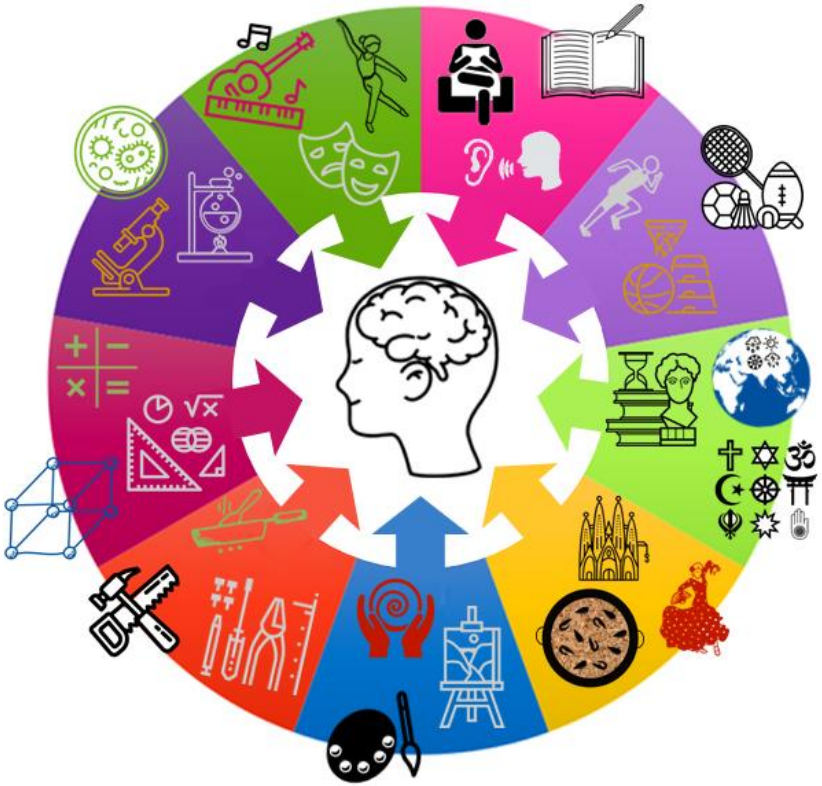
100% book - Year 10 Grammar

Aim to memorise 100% of the knowledge on these Knowledge Organisers.



Term 5

Swindon Academy 2024-25	
Name:	
Tutor Group:	
Tutor & Room:	

"If you are not willing to learn, no one can help you.
If you are determined to learn, no one can stop you."

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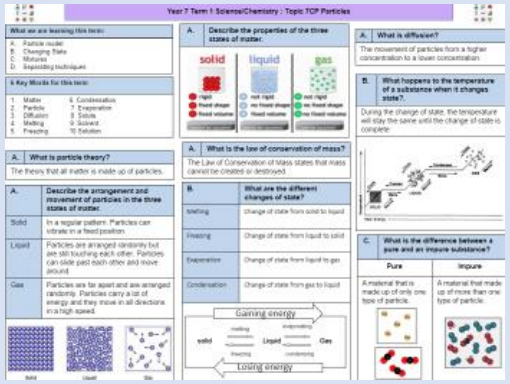
How to use your 100% book of Knowledge Organisers and Quizzable Organisers

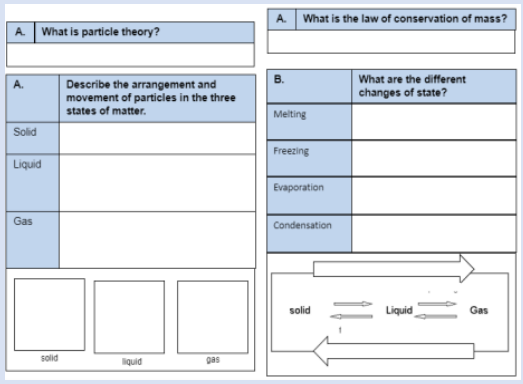
Knowledge Organisers



Knowledge Organisers contain the essential knowledge that you MUST know in order to be successful this year and in all subsequent years.

They will help you learn, revise and retain what you have learnt in lessons in order to move the knowledge from your short-term memory to long-term memory.

Quizzable Knowledge Organisers



These are designed to help you quiz yourself on the essential Knowledge.

Use them to test yourself or get someone else to test you, until you are confident you can recall the information from memory.

Top Tip

Don't write on your Quizzable Knowledge Organisers! Quiz yourself by writing the missing words in your prep book. That way you can quiz yourself again and again!

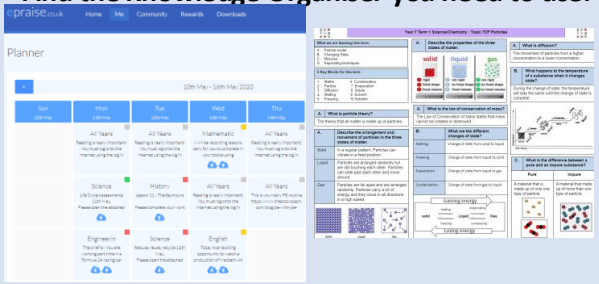
Expectations for Prep and for using your Knowledge Organisers

1. Complete all prep work set in your subject prep book.
2. Bring your prep book to every lesson and ensure that you have completed all work by the deadline.
3. Take pride in your prep book – keep it neat and tidy.
4. Present work in your prep book to the same standard you are expected to do in class.
5. Ensure that your use of SPAG is accurate.
6. Write in blue or black pen and sketch in pencil.
7. Ensure every piece of work has a title and date.
8. Use a ruler for straight lines.
9. If you are unsure about the prep, speak to your teacher.
10. Review your prep work in green pen using the mark scheme.

How do I complete Knowledge Organiser Prep?

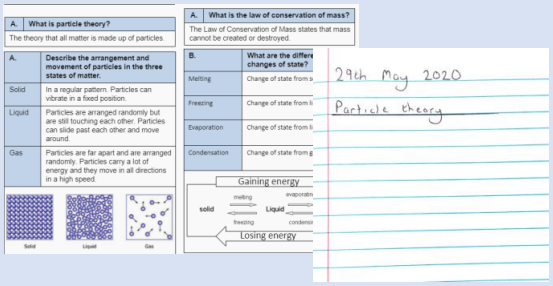
Step 1

Check Epraise and identify what words /definitions/facts you have been asked to learn. Find the Knowledge Organiser you need to use.



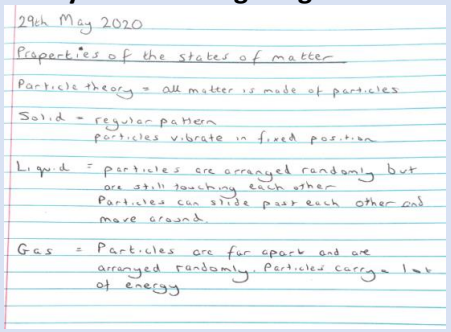
Step 2

Write today's date and the title from your Knowledge Organiser in your Prep Book.



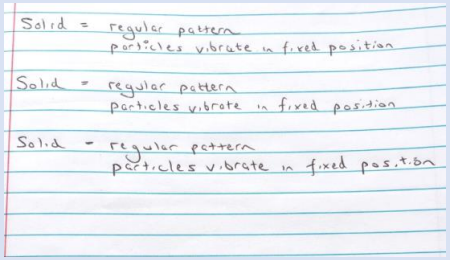
Step 3

Write out the keywords/definitions/facts from your Knowledge Organiser in FULL.



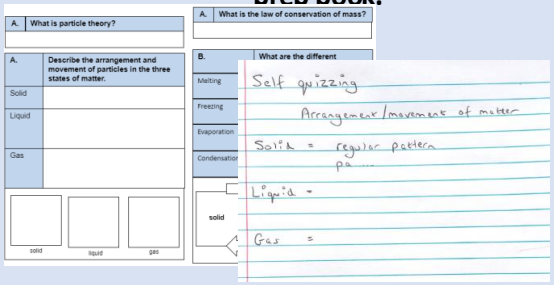
Step 4

Read the keywords/definitions/facts out loud to yourself again and again and write the keywords/definitions/facts at least 3 times.



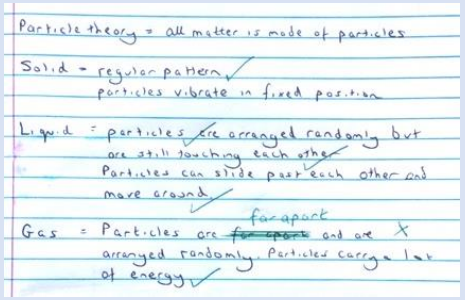
Step 5

Open your quizzable Knowledge Organiser. Write the missing words from your quizzable Knowledge organiser in your prep book.



Step 6

Check your answers using your Knowledge Organiser. Repeat Steps 3 to 5 with any questions you got wrong until you are confident.



Make sure you bring in your completed Prep notes to demonstrate that you have completed your prep.

KS4 MACBETH Grammar

1. Context

Playwright: Shakespeare (April 23rd 1564-April 23rd1616)
Dates: written around 1606
Published: in 'the First Folio, 1623
Era: Jacobean
Genre: Tragedy = *A play ending with the suffering and death of the main character.*
Set: Scotland,
Structure: Five Act Play

Macbeth. The plot is partly based on fact. Macbeth was a real 11th Century king who reigned Scotland from 1040-1057. Shakespeare's version of the story originates from the Chronicles of Holinshed (a well known historian). The play was most likely written in 1606 – the year after the Gunpowder Plot of 1605 – and reflects the insecurities of Jacobean politics.

The Divine Right of Kings says that a monarch is not subject to earthly authority and that they have the right to rule directly from the will of God. It implies that only God can judge an unjust king and that any attempt to depose, dethrone or restrict his powers runs contrary to the will of God and may constitute a sacrilegious act. The action of killing a king is called regicide and is considered a terrible crime.

King James I of England (and VI of Scotland) came to the throne in 1603 following the death of Queen Elizabeth I. The play pays homage to the king's Scottish lineage. The witches' prophecy that Banquo will found a line of kings is a clear nod to James' family's claim to have descended from the historical Banquo. James was convinced about the reality of witchcraft and its great danger to him leading to witch trials. The play is probably not written simply to please James, but certainly looks at relevant ideas.

Shakespearean Tragedy. Macbeth is one of Shakespeare's tragedies and follows specific conventions. The climax must end in a tremendous catastrophe involving the death of the main character; the character's death is caused by their own flaw(s) (hamartia) yet the character has something the audience can identify with.

The Great Chain of Being was a belief in a strict religious hierarchy (see key vocabulary) of all things which was believed to have been decreed by God. This idea was important in Elizabethan and Jacobean beliefs. The chain starts from God and progresses downward to angels, demons (fallen/renegade angels), stars, moon, kings, princes, nobles, commoners, wild animals, domesticated animals, trees, other plants, precious stones, precious metals, and other minerals.

Conventions of a Shakespearean Tragedy

A **tragic hero** who falls from greatness through a flaw of their own character.	**Hamartia** – the flaw in the tragic hero that destroys them.	A **hero of status** – the central characters are people of importance, with power and status to lose.
External conflict – his tragedies feature conflict between characters, and always lead to death.	**Internal conflict** – there are frequent moments of self-doubt or internal torment.	**Supernatural elements** – Many of Shakespeare's tragedies feature supernatural influences.

2. Key Characters

Macbeth: The eponymous protagonist is the tragic hero of this play. He is both ambitious and ruthless. He falls from loyal and respected warrior to a paranoid, tyrannical king, before dying in battle in Act V.

Lady Macbeth: A strong, ambitious and manipulative woman who exerts pressure on Macbeth to pursue him ambition of becoming king by murdering Duncan. Unable to deal with the guilt of these actions and is driven to madness and suicide.

The Witches / Weird Sisters: Supernatural and manipulative beings who seem to be able to predict the future. They are unearthly and omniscient.

Banquo: Macbeth's close friend and ally is astute and loyal. Macbeth sees him as a threat. He is virtuous, admired by audiences, and mistrustful of the supernatural witches.

Duncan: King of Scotland at the beginning of the play. He is a virtuous, strong and respected leader, held up as the model of good kingship by others in the play. He is murdered by Macbeth in Act 2.

Macduff: A soldier who is loyal to Duncan and is suspicious of Macbeth. His family is murdered by Macbeth's soldiers and he eventually exacts revenge by killing Macbeth. He was born by caesarian section and therefore was "not of woman born".

Malcolm: Duncan's son and next in line to the throne. He is described as a good man in the play.

3. Central Themes

Ambition	The play is about the corrupting power of ambition. Both Lady Macbeth and Macbeth are urged to action by the prophecies of the witches, but they still commit their crimes themselves because they want greater power. Their ambition leads them to violence and death.
Kingship and Tyranny	The play contrasts the kind and wise rule of Duncan, who is described as a virtuous (good) king, with the brutal rule of Macbeth, who quickly becomes called a tyrant. The play shows how Macbeth has no divine right to rule and upsets the natural order by killing Duncan.
Order and Disorder	The play subverts the natural order of the world. Macbeth's actions are based on a supernatural belief in a prophecy. It depicts an anarchic world: Macbeth inverts the order of royal succession; his wife inverts the patriarchal hierarchy; the unnatural world disrupts the natural. The disruption underpins the conflict that is not only external and violent but internal as Macbeth and his wife come to terms with what they've done.
Appearance and Reality	Characters in the play are often not what they seem. Lady Macbeth and Macbeth are duplicitous towards Duncan, the witches equivocate (not say what they really mean) and cannot be trusted, Lady Macbeth seeks to manipulate Macbeth.

4. Key Vocabulary

tyrant	cruel leader
duplicitous	deliberatly dishonest
equivocation	a half truth
regicide	the act of killing a king
sceptical	someone who is unconvinced or doubtful
conflict	a serious disagreement or argument
valiant	great courage in the face of danger
ephemeral	lasting a very short time
transient	something that lasts for a short amount of time
androgyny	of indistinct gender
melancholy	deep sadness
emasculate	to deprive a man of his stereotypical role
catalyst	speeds up a reaction
sacrilege	destruction of something holy
motif	repeated image

5. Key Terminology, Symbols and Devices

Motif	A recurring image or idea that has symbolic importance. The best example in Macbeth would be blood.
Soliloquy	When a character is alone on stage and speaks their thoughts aloud to themselves.
Iambic Pentameter	A line of a play or poem that has ten syllables organised into five pairs of syllables, where the second in each pair is emphasised. e.g. "When *you* durst *do* it *then* you *were* a *man*"
Foreshadowing	When a hint or warning is given about a later event.
Dramatic Irony	When a character is unaware of something that the audience is aware of, so they don't know the full significance of their words.
Symbolism	When something symbolises a set of ideas e.g. "The raven himself is hoarse" – raven symbolic of death, supernatural.
Aside	When a character pauses in a conversation to speak only to the audience or another character, unheard by the rest.

The Big Ideas	Notes	The Methods	Notes
1. Shakespeare uses the play to demonstrate the terrible consequences of disrupting the **natural order**. His rule is unnatural and brings only disorder and sickness. His death restores balance.		1. Shakespeare **uses blood as a metaphor for guilt** through the play. As the guilt increases, the volume of blood increases.	
2. Shakespeare uses the play to demonstrate the consequences of engaging with **the supernatural.**		2. Shakespeare uses **apparitions** to present the consequences of ungodly behaviour and is ambiguous about whether they are real or imagined.	
3. Shakespeare uses Macbeth's role as a tragic hero to highlight how vulnerable people are to the destructive **temptation of power.**		3. Shakespeare's **characterisation of Macbeth and Lady Macbeth** establishes the idea that ungodly deeds do not go unpunished.	

10GS – Biology – Term 5

The nervous system

Job is to **detect** stimuli (changes in environment) and **respond** if needed.
Consists of:

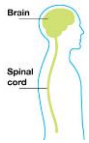
Receptors

Specialised cells that detect stimuli, found in sense organs and internally

Neurones

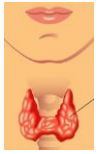
3 types – sensory, relay and motor
Carry **impulses** joining all parts of the nervous system

Co-ordination Centres



Brain, spinal cord, pancreas.
Coordinates the response

Effectors



Organs that bring about a response

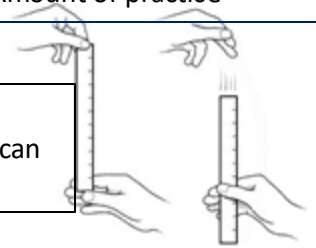
muscle or gland

RP 6 - Investigation into the effect of a factor on human reaction time.

1. Person A holds out hand with a gap between thumb and finger.
2. Person B holds ruler with the zero at the top of person A's thumb.
3. Person B drops ruler without telling Person A and Person A must catch it.
4. The distance on the ruler level with the top of person A's thumb is recorded
5. Repeat this ten times.
6. Repeat steps 1-5 after a factor has been changed
7. Use conversion table to convert ruler measurements into reaction time.

The 'factor' could be…
- Caffeine consumption
- Hours of sleep
- Alcohol consumption
- Amount of practice

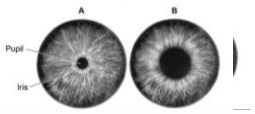
A computer reaction test can also be used.

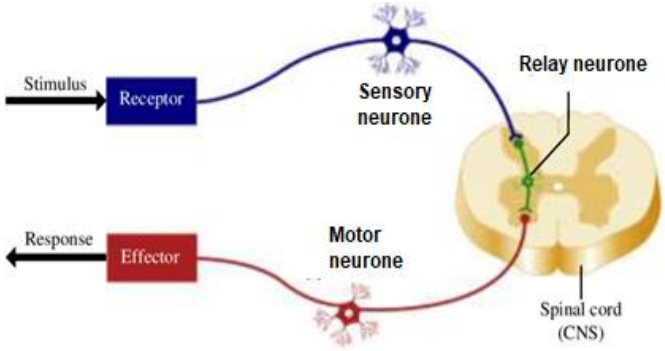


Control variables : distance above the hand, distance between finger and thumb, hand used (dominant or non-dominant, all other factors listed in the box above except the one being changed.

Reflexes

A reflex is an automatic, rapid response
Reflexes do not involve the conscious part of the brain, so cannot be overridden
The response might be brought about by:
- muscle - e.g. pupil being constricted with bright light or knee jerk response
- gland – e.g. mouth watering or tears being released when something gets in your eye





Reflex Arc

stimulus → receptor → **sensory neurone** → **relay neurone** → **motor neurone** → effector → response

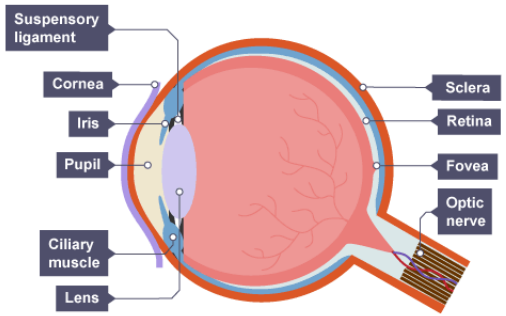
Example

Hot pan → pain receptors → **sensory neurone** → **relay neurone** → **motor neurone** → hand muscles → release pan

10GS – Biology – Term 5

The eye

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



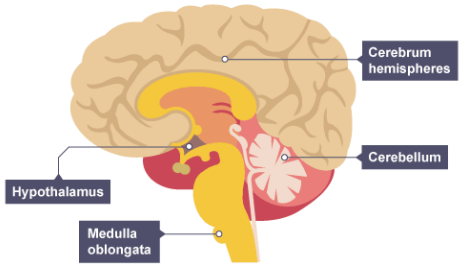
Structure	Function
Cornea	Refracts light - bends it as it enters the eye
Iris	Controls how much light enters the pupil
Lens	Further refracts light to focus it onto the retina
Retina	Contains the light receptors
Optic nerve	Carries impulses between the eye and the brain
Sclera	Tough white outer layer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

To focus on a near object – the lens becomes thicker, this allows the light rays to refract (bend) more strongly.
To focus on a distant object – the lens is pulled thin, this allows the light rays to refract slightly.

The amount of light entering the eye is controlled by a reflex action. The size of the pupil changes in response to bright or dim light. This is controlled by the muscles of the iris.

The brain

The brain controls complex behaviour. It is made of billions of interconnected neurones and has different regions that carry out different functions.



There are four main areas in the brain:
•The **cerebrum** (the outer layer is called the cerebral cortex). It controls 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.

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.** They use strong magnetic fields and radio waves to show details of brain structure and function.

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.

10GS – Biology – Term 5

Controlling body temperature

- Body temperature is monitored and controlled by the thermoregulatory centre of the brain.
- The thermoregulatory centre contains receptors sensitive to the temperature of the blood.
- Human body temperature is 37°C
- The skin also contains temperature receptors that feedback to the thermoregulatory centre in the brain.

Response when body temperature too high

Energy transfer from the skin to the surroundings is increased by:
- Vasodilation (the blood vessels dilate – get wider).
- Sweat is produced.

Response when body temperature too low

Energy transfer from the skin to the surroundings is reduced by:
- Vasoconstriction (the blood vessels constrict – get narrower).
- Sweat production stopped.
- Muscles contract (shiver), this requires the exothermic reaction respiration which increases the temperature of the muscles.

The human kidney

- The kidneys are important for excretion and homeostasis.
- The kidneys produce urine by filtering the blood. It then reabsorbs all of the glucose and any mineral ions and water needed by the body by selective reabsorption.
- **ADH**
- The water balance of the blood is controlled by the hormone ADH.
- ADH changes the amount of water reabsorbed by the kidney tubules.
- ADH is secreted by the pituitary gland in the brain.

Low water concentration in the blood	High water concentration in the blood
More ADH released	Less ADH released
More water reabsorbed	Less water reabsorbed
Small amount of concentrated urine produced	Large amount of diluted urine produced

Removing waste

- carbon dioxide produced during respiration can produce an acidic solution.
- carbon dioxide is removed via the lungs.
- Urea is produced during the breakdown of proteins.
- Proteins are broken down to amino acids which cannot be stored by the body.
- The liver removes the amino group from amino acids via a process called deamination to produce ammonia which is very toxic.
- Ammonia is converted to urea.

- If cells lose or gain too much water by osmosis, they do not function efficiently.

Uncontrolled loss of water and mineral ions

- Water loss via the lungs during exhalation.
- Water, mineral ion and urea loss through sweat in the skin.

Controlled loss of water and mineral ions

- Water, mineral ion and urea loss via the kidneys in the urine.

Treating kidney failure

Dialysis
- A dialysis machine carries out the function of the kidneys.
- The level of useful substances in the blood are maintained while urea and excess mineral ions pass from the blood into the dialysis fluid.

Disadvantages:
- A strict diet needs to be followed.
- You need to send regular long sessions connected to the dialysis machine.
- The blood levels are in balance for only a short time so you can feel tired and unwell between treatments.
- It can become harder to balance substance in the blood if you have dialysis for a long period of time.

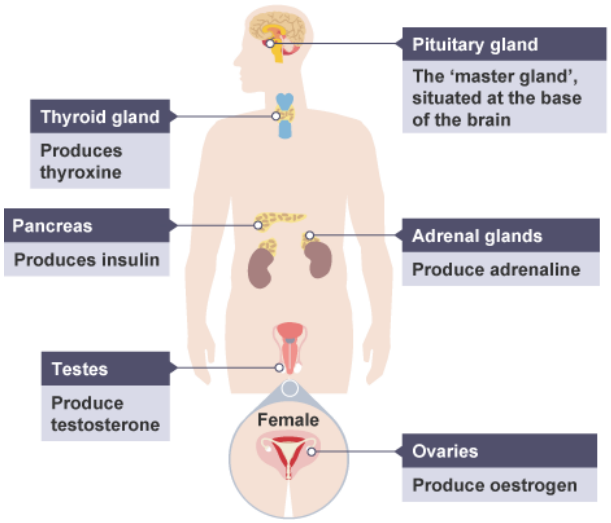
Transplant
- A kidneys from a donor replaces the diseased or damaged kidney.
- To prevent reject the tissue types of the recipient and donor are matched closely.

Disadvantages:
- Immunosuppressant drugs need to be taken to reduce the chance of rejection.
- There is a shortage of donor kidneys.

10GS – Biology – Term 5

Hormonal responses

Hormones are chemicals released by glands
They are carried in the bloodstream.
Hormonal responses are slower than nervous responses but they last longer.



Homeostasis

This means keeping internal conditions (of the body or a cell) constant to ensure optimum functioning.
In humans, this includes regulating:

- temperature
- water levels
- blood glucose concentration

Homeostasis can involve nervous or hormonal responses.
Receptors detect changes in the body
Coordination centres (brain, pancreas, spinal cord etc) receive and process information
Effectors carry out responses to return to normal

Blood glucose concentration

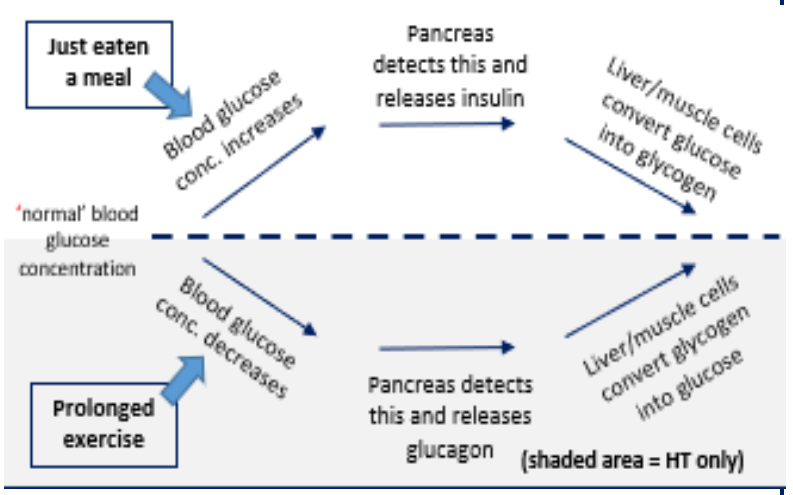
Blood glucose is monitored by the **pancreas.**

If glucose levels rise, the pancreas releases **insulin** into the blood.

This is a message to the liver to remove glucose and store it as **glycogen**.

If blood glucose is too low, **glucagon** is released.

The liver responds by breaking down glycogen into glucose and releasing it into the blood.



Diabetes

There are two types – Type 1 and Type 2
Both result in a lack of control over blood glucose levels

	Type 1	Type 2
Cause	No insulin is made by the pancreas	Insulin is made, but the liver and muscle cells do not respond
Treatment	Injections of insulin Pancreatic transplant	Controlling carbohydrate intake Losing weight

HT only
Negative feedback is when the release of something brings the levels back towards acceptable levels, it maintains a steady state.
E.g. if blood glucose increases, insulin is released to bring blood glucose back towards the normal range.

10GS – Biology – Term 5

Adrenaline and thyroxine (HT only)

Adrenaline is produced by the **adrenal glands**.
It is produced in times of fear or stress.
It **increases heart rate** to ensure **more oxygen and glucose** to the cells to prepare for the
'fight or flight' response.
Thyroxine is produced by **the thyroid gland.**
It is involved in regulating **metabolic rate** and growth and development.

Puberty

Females – **Oestrogen** is the main female reproductive hormone produced in the ovary. At puberty, eggs begin to mature, and one is released approximately every 28 days. This is called ovulation.

Males – **Testosterone** is the main male reproductive hormone produced by the testes and it stimulates sperm production.

Name of contraception	Description	+	–
Condoms/diaphragm	Barrier	Very effective, condom protects against STIs	Unreliable if not used properly
Oral Contraception (pill)	Hormonal (oestrogen or progesterone, stops FSH so no eggs mature)	Very effective	Must remember to take everyday, can have side effected
Injection/implant/skin patch	Slow-releasing hormone	Long lasting	Side effects such as heavy periods
Intrauterine Device (IUD or Coil)	Barrier method. Can also contain hormones	Long lasting (up to 5 years)	Side effects such as heavy periods
Surgical Sterilisation	Tying or cutting of sperm ducts/ oviducts.	Almost 100% effective	Difficult or impossible to reverse

Menstrual Cycle

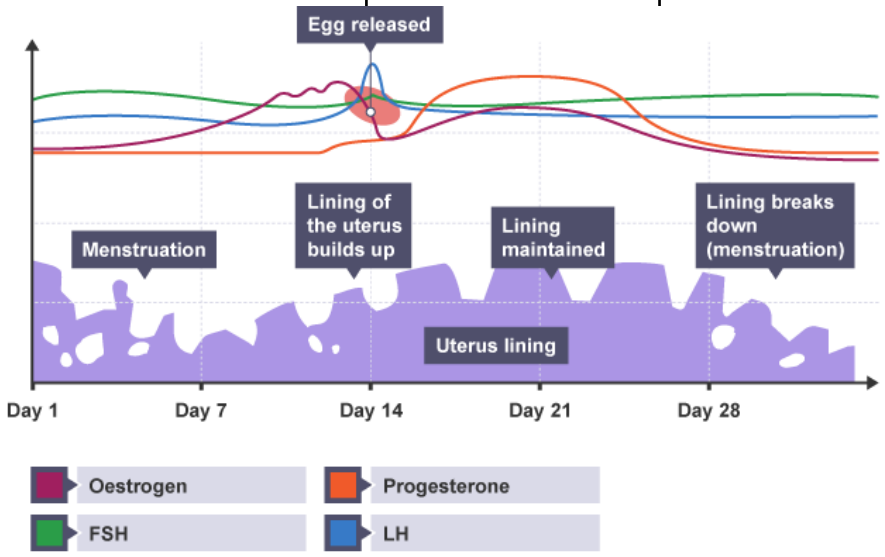
The menstrual cycle is controlled by several hormones:

FSH –from the pituitary. Causes an egg to mature in the ovary

LH – from the pituitary. Causes ovulation

Oestrogen and progesterone are involved in maintaining the lining of the womb.

HT – Oestrogen also feeds back to the pituitary to stop producing FSH.



Infertility (HT only)

Fertility drugs LH and FSH can be given to increase the number of eggs released and increase the change of fertilisation. .

IVF

- Woman takes a dose of FSH and LH - stimulates the maturation of several eggs.
- Eggs are collected and fertilised by sperm from the male
- Fertilised eggs develop into embryos.
- One or two embryos inserted into the female's uterus.

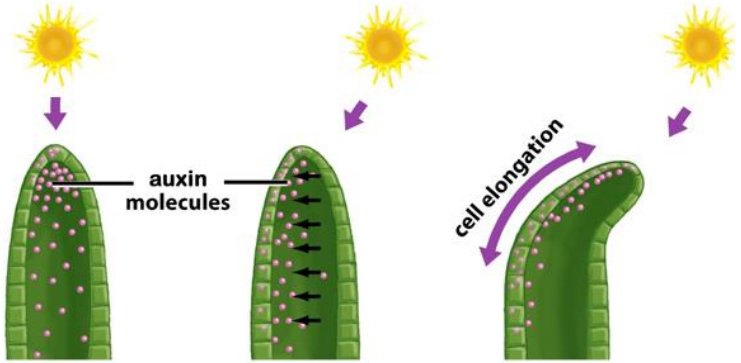
Negatives;

- very emotionally/ physically stressful
- success rates are not high
- can lead to multiple births (twins, etc.)
- Many embryos are not used & destroyed

Plant hormones

Plants produce hormones to coordinate and control growth and responses to light (phototropism) and gravity (gravitropism or geotropism).

Unequal distributions of auxin cause unequal growth rates in plant roots and shoots.



The auxin collect son the side of the plant in the shade.

Gibberellins are important in initiating seed germination.

Ethene controls cell division and ripening of fruits.

The uses of plant hormones

Plant growth hormones are used in agriculture and horticulture.

Auxins are used:
- as weed killers
- as rooting powders
- for promoting growth in tissue culture.

Ethene is used in the food industry to control ripening of fruit during storage and transport.

Gibberellins can be used to:
- end seed dormancy
- promote flowering
- increase fruit size.

10GS T5 - C6 – Rate and extent of chemical change

Rate of reaction.

Measuring the rate of anything always involves a **measurement of time**

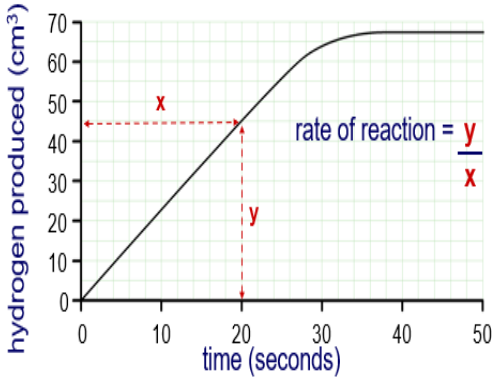
The rate of a chemical reaction can be found using:

$$\text{rate} = \frac{\text{quantity of reactant used}}{\text{time}}$$

$$\text{rate} = \frac{\text{quantity of product formed}}{\text{time}}$$

Quantities for reactants or products are measured in **mass in g** or by **volume in cm³**

Rate calculations can be done from tables of data or graphs:



Volume of hydrogen produced = 45cm

Time taken = 20 seconds

Rate = $\frac{45}{20}$ cm³

rate = 2.25 cm³/s

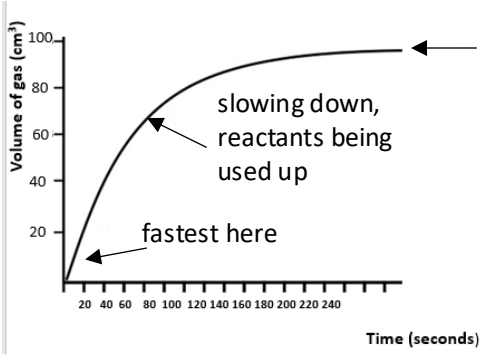
The progression of a chemical reaction

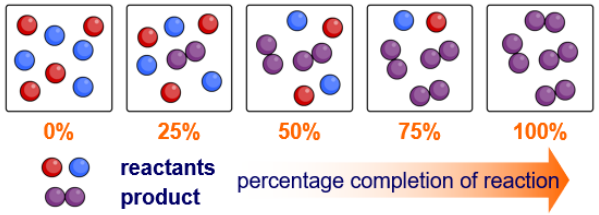
For a reaction to take place, reactant particles have to collide.

The rate of a reaction depends on the **frequency of collisions** and **the energy with which the particles collide.**

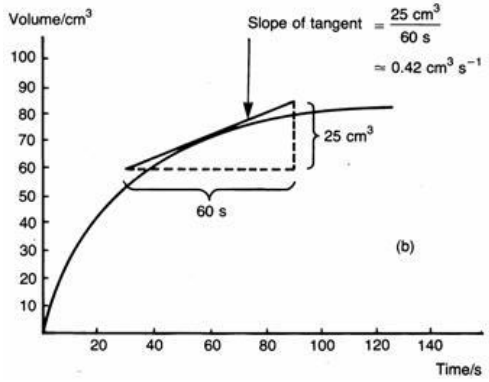
The minimum amount of energy needed to start a reaction is called the **activation energy**.

A reaction is always **fastest at the beginning** and slows down over time as the reactants get used up and the frequency of collisions decreases.





Using a tangent to calculate rate (HT)



- Draw a line along the point you're interested in. The line should touch the curve at the point given.
- Make a triangle. Try to make the angles either side of the line equal.
- Measure the change in volume and change in time
- Calculate the gradient
- Use units from the axes to determine the units for rate

10GS T5 - C6 – Rate and extent of chemical change

1. Give two ways of calculating the rate of a reaction

2. What does a rate calculation always have to include?

3. What are solid reactants or products measured in?

4. What are liquid or gaseous products measured in?

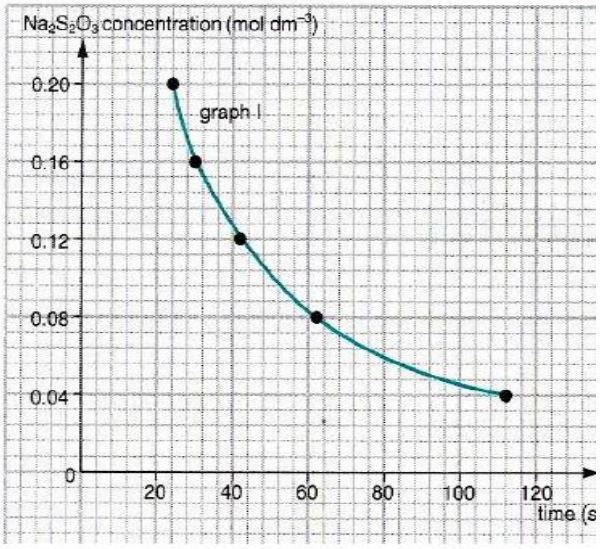
5. How is the rate calculated from a graph?

1. What point in a reaction is the fastest?

2. Why does a reaction slow down as it progresses?

3. Why do reactions stop?

4. What two factors affect the rate of a reaction?



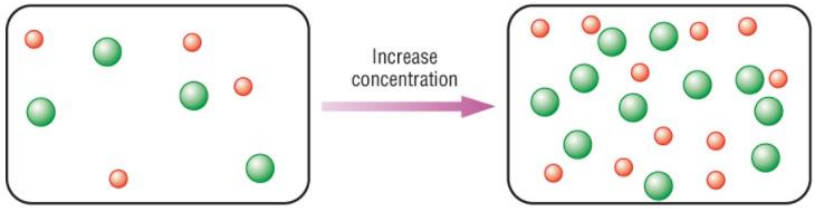
1. Describe how to draw a tangent at 50s.

2. Draw the tangent at 50s

3. What will the units for the rate of this reaction be?

10GS T5 - C6 – Rate and extent of chemical change

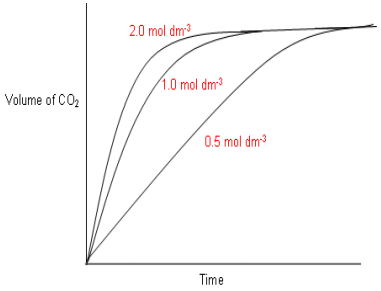
The effect of concentration



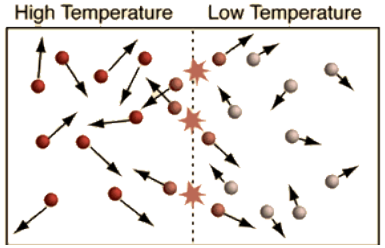
Concentration means number of particles per cm^3

Increasing the concentration of any of the reactants increases the rate of the reaction

This is because there are more particles per cm^3 so there are **more frequent collisions**, increasing the rate.

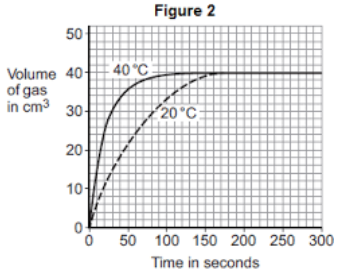


The effect of temperature

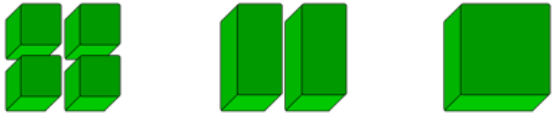


Increasing the temperature of the reactants increases the rate of the reaction.

This is because the particle have more kinetic energy and therefore move faster, so there are **more frequent collisions**, increasing the rate.



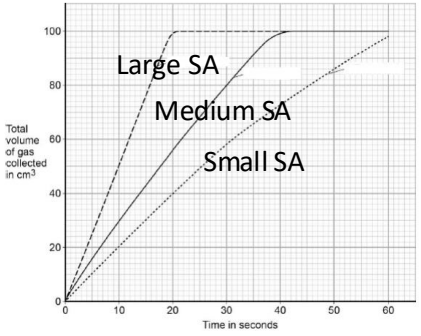
The effect of surface area



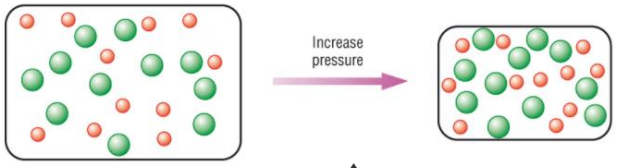
The smaller the pieces of a solid, the higher the surface area

Increasing the surface area of solid reactants increases the rate of reaction.

This is because there is a greater area available for collisions to occur so there are **more frequent collisions**, increasing the rate.

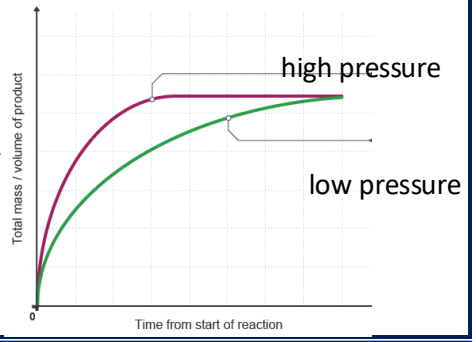


The effect of pressure



Increasing the pressure of gaseous reactions increases the rate of the reaction.

This is because the same number of particles are now in a smaller volume, so there are **more frequent collisions**, increasing the rate.

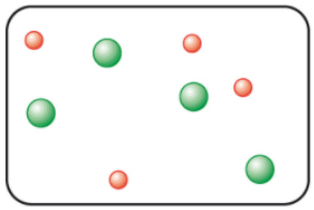


In all cases, the overall amount of product is the SAME, the end point of the reaction is just reached faster

10GS T5 - C6 – Rate and extent of chemical change

The effect of concentration

1. In the box below, draw a reaction involving a higher concentration of the green reactant molecules.



2. What happens to the rate of a reaction if you increase the concentration?

The effect of temperature

1. Describe how increasing the temperature affects the rate of a reaction.

2. Explain why this happens in terms of particles.

The effect of surface area

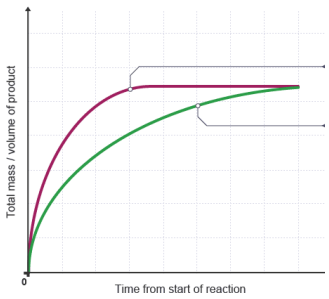
1. Reactions involving what sort of reactant are affected by surface area?

2. What type of piece has a large surface area?

The effect of pressure

1. Reactions involving what type of reactants are affected by pressure?

2. Label the diagram with 'low pressure' and 'high pressure'



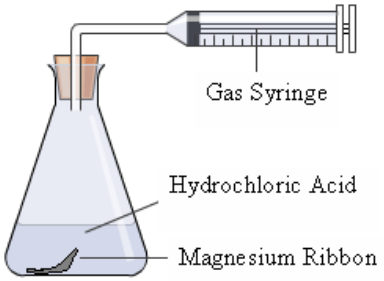
What happens to the overall amount of product if you change the rate of a reaction?

10GS T5 - C6 – Required practical – the effect of concentration on rate of reaction

Experiment 1

Using volume of gas collected over time as a measure of the rate

$$Mg + 2HCl \rightarrow MgCl_2 + H_2$$

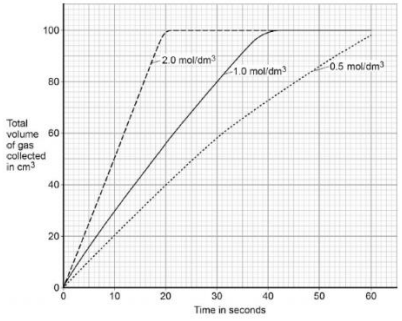


Independent variable: concentration of HCl
Dependent variable : Volume of gas produced / min
Control variables : volume of HCl, mass of Mg, temperature of acid

Method

1. Measure 20cm^3 0.5M HCl into a conical flask.
2. Insert 2 x 2cm pieces of Mg and attach a gas syringe
3. Start a stopwatch and measure the volume of gas collected every 20 seconds until the reaction is over.
4. Repeat using different concentrations of HCl.

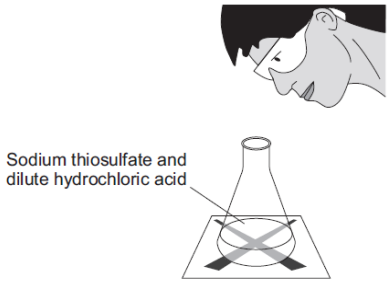
An increase in the concentration leads to an increase in the rate of the reaction, but the same volume of product overall



Experiment 2

Investigating the effect of changing the concentration of HCl on the rate of reaction

$$HCl_{(aq)} + Na_2S_2O_{3\ (aq)} \rightarrow NaCl_{(aq)} + SO_{2(g)} + S_{(s)} + H_2O_{(l)}$$



The sulphur being made is insoluble and is what makes the liquid go cloudy

Independent variable: concentration of HCl
Dependent variable : Time taken for the cross to disappear
Control variables : volume of HCl, volume of sodium thiosulphate, temperature of both solutions, concentration of sodium thiosulphate

Method

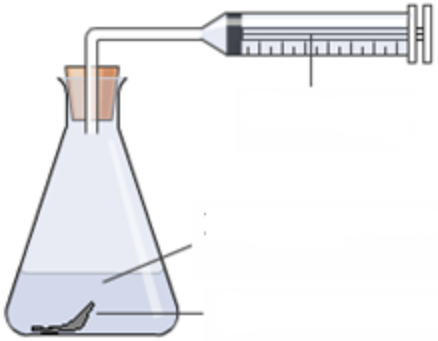
1. Use a measuring cylinder to put 10 cm^3 sodium thiosulfate solution into the conical flask.
2. Put the conical flask on the black cross.
3. Put 10 cm^3 of 0.5M hydrochloric acid into the 10 cm^3 measuring cylinder.
4. Put this acid into the flask. At the same time swirl the flask gently and start the stopwatch.
5. Look down through the top of the flask. Stop the stopwatch when you can no longer see the cross. Record the time.
6. Repeat steps 1-5 using different concentrations of HCl – 1M, 1.5M, 2M and 2.5M

10GS T5 - C6 – Required practical – the effect of concentration on rate of reaction

Experiment 1

Using volume of gas collected over time as a measure of the rate

$$Mg + 2HCl \rightarrow MgCl_2 + H_2$$

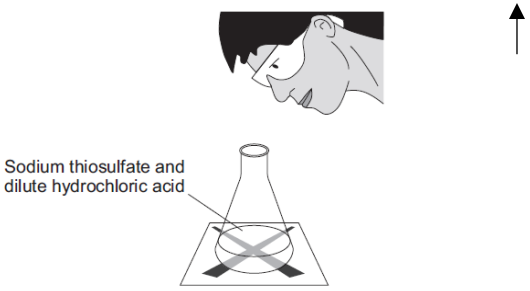


1. Label the diagram to show the equipment and chemicals used in this investigation
2. What is the independent variable?
3. Name two control variables.
4. What is a sensible volume of HCl to use?
5. Which piece of equipment, essential for a rate calculation, is not shown?

Experiment 2

Investigating the effect of changing the concentration of HCl on the rate of reaction

$$HCl_{(aq)} + Na_2S_2O_{3\ (aq)} \rightarrow NaCl_{(aq)} + SO_{2(g)} + S_{(s)} + H_2O_{(l)}$$

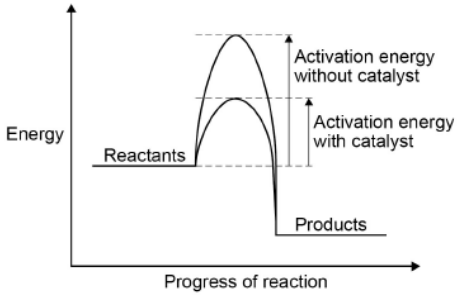


1. What is the dependent variable in this reaction?
2. Why does the solution go cloudy?
3. Name two control variables.

10GS T5 - C6 – Rate and extent of chemical change

Catalysts

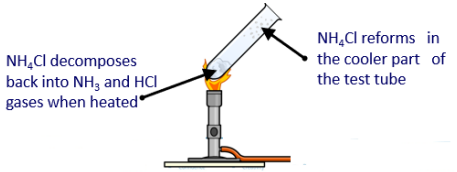
- Catalysts are substances that speed up chemical reactions without themselves being used up.
- They provide a different pathway for the reaction with a lower activation energy.
- Different reactions require different catalysts.



Reversible reactions

These are reactions in which the products can react to produce the original reactants
They are represented by the symbol ⇌
The direction of the reaction can be changed by changing the conditions
For example:

ammonium chloride $\underset{\text{cool}}{\overset{\text{heat}}{\rightleftharpoons}}$ ammonia + hydrogen chloride



If a reaction is exothermic in one direction, it is endothermic in the opposite direction.
The same amount of energy is transferred in each case.

hydrated copper sulfate (blue) $\underset{\text{exothermic}}{\overset{\text{endothermic}}{\rightleftharpoons}}$ anhydrous copper sulfate (white) + water

When a reversible reaction takes place in sealed apparatus, then a point occurs when the forward and backward reactions occur at the same rate. This is **equilibrium**

The effect of changing conditions on equilibrium (Le Chatelier's principle)

If a system is at equilibrium and a change is made to the conditions, then the system responds to counteract the change.
E.g. – if the temperature is increased, then the system will respond by increasing the rate of the endothermic reaction, to bring the temperature back down

If the concentration of the reactants is increased, then equilibrium will shift right and more products will be made.

In gaseous reactions, a change in pressure will result in equilibrium shifting to the side that restores the pressure.
E.g. :

$N_2 + 3H_2 \rightleftharpoons 2NH_3$

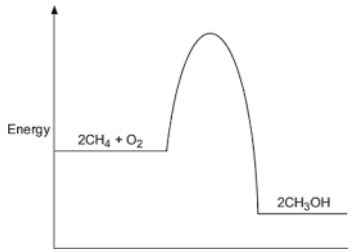
In this reaction, there are 4 moles of gas on the reactants side and only 2 on the product side
If the pressure is increased, equilibrium will shift right as there are fewer moles on the products side, and this will decrease the pressure.

10GS T5 - C6 – Rate and extent of chemical change

1. What is a catalyst?

2. How do they speed up reactions?

3. Draw on the energy level diagram below to show how it would change in the presence of a catalyst.



1. What is a reversible reaction?

2. What symbol is used in an equation to represent a reversible reaction?

3. If a reaction is endothermic in the forward direction, what does this tell us about the backward reaction?

4. If 300J of energy is absorbed during an endothermic reaction, how much will be released in the opposite direction?

5. What is equilibrium?

1. When a change is introduced into a closed system, what does the system respond in order to do?

2. If the temperature of a reaction mixture at equilibrium is increased, what would the change aim to do?

3. What sort of reaction would achieve a drop in temperature?

4. If the pressure is increased in a gaseous reaction, which way would equilibrium shift?

Side with fewest moles/side with most moles

C7 – Organic Chemistry

Crude oil

Crude oil = a mixture of **hydrocarbons.**

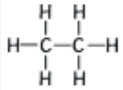
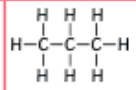
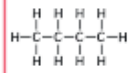
- It is a **non-renewable resource (fossil fuel)**
- Made from remains of dead sea creatures **compressed** over millions of years

Hydrocarbons - molecules containing **hydrogen** and **carbon only**.
Two types of hydrocarbons are **alkanes** and **alkenes**.
The hydrocarbons in crude oil are mostly alkanes.

Alkanes

- Alkanes = **saturated** hydrocarbons.
- Held together by **single covalent bonds**.
- General formula = C_nH_{2n+2}
- Have different boiling points – longer the chain, higher the boiling point

You need to remember the names, and formulas of the first 4 alkanes.

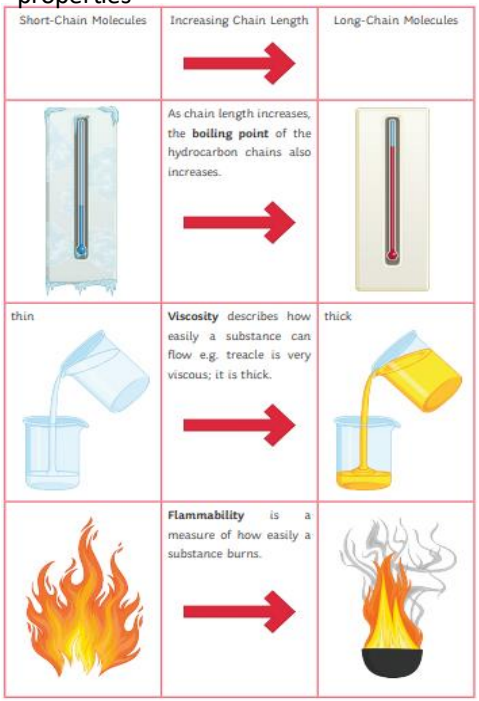
Name of Alkane	Structural Formula	Molecular Formula
methane		CH_4
ethane		C_2H_6
propane		C_3H_8
butane		C_4H_{10}

Fractional Distillation

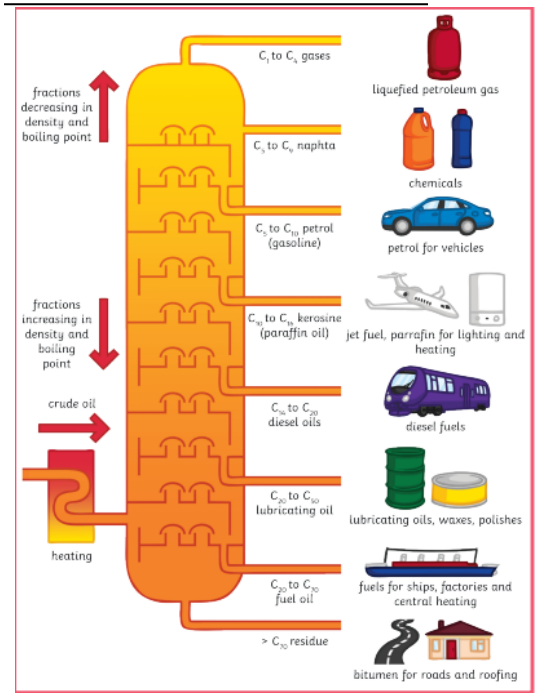
- Used to **separate** the mixtures of hydrocarbons in **crude oil**.

Steps in Fractional Distillation

1. Crude oil enters **fractioning column** and is heated to boiling point so the hydrocarbons evaporate.
2. It is **cooler** at the **top** of the fractionating column and **hotter** at the **bottom**.
3. Vapours rise up the column and, as they rise, they cool
4. The different hydrocarbons condense at different **boiling points**
5. The different 'fractions' have different properties



Uses of the different fractions



Supply and demand

Product	Supply in tonnes	Demand in tonnes
petrol	100	300
diesel	200	100
heating oil	250	50

After fractional distillation, we find:

- we have more of the long chain hydrocarbons than we need
- There are not enough short chain hydrocarbons.
- Short chain are more useful as they are more flammable so can be used as fuels.

C7 – Organic Chemistry

1. What is crude oil?
2. What is a hydrocarbon?
3. What type of hydrocarbons are alkanes?
4. State the general formula for alkanes.
5. Name the first four alkanes.
6. What sort of bonding is found in hydrocarbons?

1. What is the name for the process that results in the separation of the fractions of crude oil?
2. What happens to the boiling point of hydrocarbons as the chain length **increases**?
3. What happens to the viscosity of hydrocarbons as the chain length **increases**?
4. What does flammable mean?
5. What are the two changes of state that occur during fractional distillation?
6. Which physical property is used to separate the fractions?

1. What is one use for the hydrocarbons that are between 14 and 20 carbons long?
2. What is the range of lengths of hydrocarbons in fuel oil?
3. What are the smallest hydrocarbons used for?
4. What happens to the flammability of hydrocarbons as the chain length **increases**
5. What is the range of hydrocarbon lengths found in petrol?
6. What is the problem with supply and demand of the different hydrocarbon chains?

C7 – Organic Chemistry

Cracking

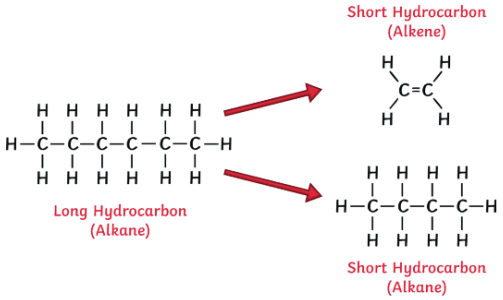
- This is done to solve the problem of having too many long chain hydrocarbons and not enough short ones
- Long hydrocarbons are **broken down** into smaller, more useful hydrocarbons.
- Short chain hydrocarbons are more useful as they are more flammable

Two types of cracking: catalytic and steam cracking.

Catalytic cracking – needs a **high temperature** and a **catalyst.**

Steam cracking – high temperature and steam

- Cracking produces a **short-chain alkane** and an **alkene.**



Cracking equations

Same number of carbon and hydrogen atoms on both sides of the equation:

$C_{20}H_{42} \rightarrow C_{14}H_{30} + C_6H_{12}$

long chain hydrocarbon | shorter, more useful alkane | alkene

Alkenes

- Alkenes are **unsaturated** hydrocarbons.
- Contain carbon-carbon **double bonds**.

Test for Alkenes

Use bromine water to test for alkenes.

If an alkene is present, the bromine water turns from orange/brown to colourless.

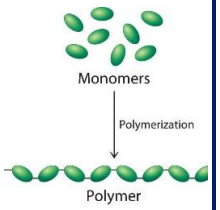
Alkanes do not react with bromine water.

Uses for alkenes:

- Can be used as fuels
- Can be used as a starting material for other chemicals
- Can be used to make polymers (e.g. plastic)

Polymers

- Polymers are large molecules made of many repeating units (monomers)
- Alkenes (small molecules) are joined together to make polymers



Poly(ethene) – plastic bags/drinks bottles

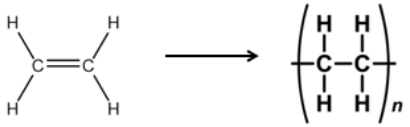
Poly(propene) – strong tough plastics

Drawing and naming polymers

1. Redraw the **monomer given**, but without the double bond. Make sure to copy all other elements exactly.
2. Put brackets around the monomer and extend joining bonds out through the brackets on both sides
3. Add an 'n' at the bottom right of the bracket
4. To name the polymer, you put **poly** in front of the monomer name

E.g.:

Draw and name the polymer made from the monomer ethene:



Combustion of Hydrocarbons

Combustion means burning.

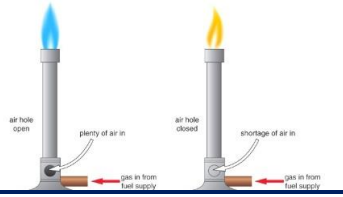
Complete combustion - when there is a good supply of **oxygen** for a fuel to burn.

Fuel + oxygen → carbon dioxide + water

Incomplete combustion - not enough oxygen

Products are **carbon monoxide** and water.

Carbon monoxide = poisonous gas



C7 – Organic Chemistry

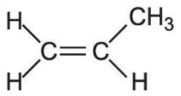
1. What is cracking?
2. Why is cracking done?
3. What are the two types of cracking?
4. What conditions are needed for catalytic cracking?
5. Complete this cracking equation by putting numbers in the boxes:

$$C_{30}H_{62} \rightarrow C_{22}H_{\square} + C_{\square}H_{\square}$$

6. What two types of hydrocarbons are formed during cracking?

1. Why are alkanes called 'unsaturated'?
2. Which chemical is used to test for alkenes?
3. What is the colour change for a positive alkene test?
4. Give two uses for alkenes
5. What are polymers?
6. What is the name for the small molecules that make up polymers?

1. What is the name of the polymer formed from the monomer butene?
2. Draw the polymer made from the monomer propene given below:



3. Name the polymer made in question 2
4. What is combustion?
5. When does incomplete combustion happen?
6. What are the waste products of complete combustion?
7. Which toxic gas is formed during incomplete combustion?

C7 – Organic Chemistry reactions

Alkenes

Alkenes are hydrocarbons with a double carbon-carbon bond.

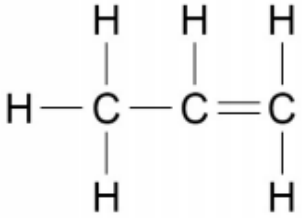
The general formula for the homologous series of alkenes is C_nH_{2n}

Alkene molecules are unsaturated because they contain two fewer hydrogen atoms than the alkane with the same number of carbon atoms.

The first four members of the homologous series of alkenes are ethene, propene, butene and pentene.

Alkene molecules can be represented in the following forms:

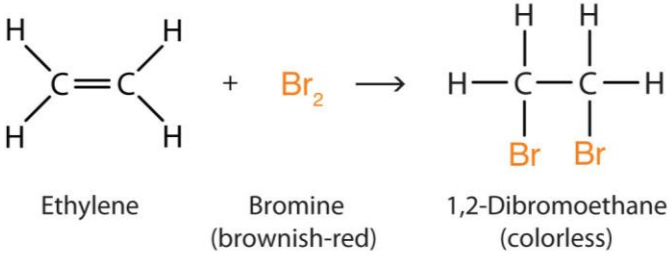
C_3H_6 (propene)



It is the functional groups that determine the reactions of organic compounds.

Alkenes react with oxygen in combustion reactions in the same way as other hydrocarbons, but they tend to burn in air with smoky flames because of incomplete combustion.

Alkenes react with hydrogen, water and the halogens, by the addition of atoms across the carbon-carbon double bond so that the double bond becomes a single carbon-carbon bond



C7 – Organic Chemistry

1. What an alkene?
2. What kind of bond is there in an alkene?
3. What is the general formula for an alkene?
4. List the first four members of the homologous series
5. Show the two ways which ethene can be represented

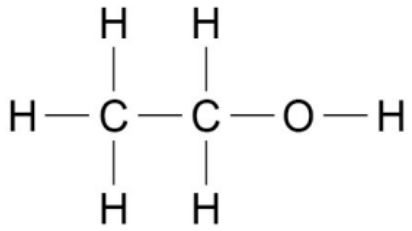
1. What type of combustion do alkenes generally do?
2. What do alkenes also react with?
3. What happens when an alkene reacts with hydrogen, water or the halogens?

C7 – Organic Chemistry reactions

Alcohols contain the functional group –OH.

Methanol, ethanol, propanol and butanol are the first four members of a homologous series of alcohols.

Alcohols can be represented in the following forms: CH_3CH_2OH or as



Aqueous solutions of ethanol are produced when sugar solutions are fermented using yeast. The conditions used for fermentation is sugars dissolved in water, mixed with yeast. an air lock to allow carbon dioxide out, while stopping air getting in. warm temperature , 25-35°C.

When any of the first four alcohols react with sodium, they form a salt (sodium alkoxide) and hydrogen gas. You will see fizzing.

Alcohols are flammable. They burn in air because of the presence of a hydrocarbon chain. They burn to produce carbon dioxide and water. This property allows alcohols to be used as a fuel.

When alcohols are added to water, they mix easily to produce a solution.

When alcohols can react with an oxidising agent. The oxidation of alcohols is an important reaction in organic chemistry. Primary alcohols can be oxidized to form aldehydes and carboxylic acids; secondary alcohols can be oxidized to give ketones. Tertiary alcohols, in contrast, cannot be oxidized without breaking the molecule's C–C bonds.

C7 – Organic Chemistry

1. What is an alcohol?

2. What is the functional group in an alcohol?

3. What is the general formula for an alcohol?

4. List the first four members of the homologous series of alcohols

5. Show the two ways which ethanol can be represented

1. How is ethanol produced

2. What are the conditions for fermentation

1. What happens when alcohols react with sodium?

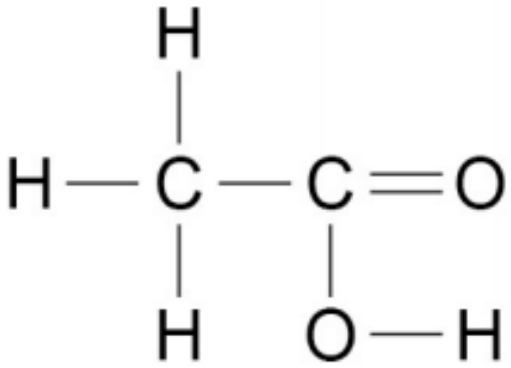
2. What happens when alcohols react with water?

3. What happens when alcohols react with air?

4. What happens when alcohols react with oxidising agents?

C7 – Organic Chemistry reactions

Carboxylic acids have the functional group –COOH. The first four members of a homologous series of carboxylic acids are methanoic acid, ethanoic acid, propanoic acid and butanoic acid. The structures of carboxylic acids can be represented in the following forms: CH_3COOH



When any of the first four carboxylic acids react with carbonates, to form a salt, water and carbon dioxide

When they dissolve in water to form acidic solutions with pH values less than 7

Carboxylic acids can react with alcohols to form esters in a process called Fischer esterification. An acid catalyst is required and the alcohol is also used as the reaction solvent.

Carboxylic acids are weak acids because they only partially ionise in solution. Their solutions do not contain many hydrogen ions compared to a solution of a strong acid at the same concentration. A weak acid's pH will be higher than a strong acid's pH at the same concentration. In a solution of strong acid, the molecules are fully ionised. In a weak acid, few of the molecules are ionised.

C7 – Organic Chemistry

1. What is a carboxylic acid?

2. What is the functional group in a carboxylic acid?

3. What is the general formula for a carboxylic acid?

4. List the first four members of the homologous series of carboxylic acids

5. Show the two ways which ethanoic acid can be represented

1. What happens when carboxylic acid react with carbonates?

2. What happens when carboxylic acid dissolve in water?

3. What happens when carboxylic acids react with alcohol?

1. Why are carboxylic acids weak acids?

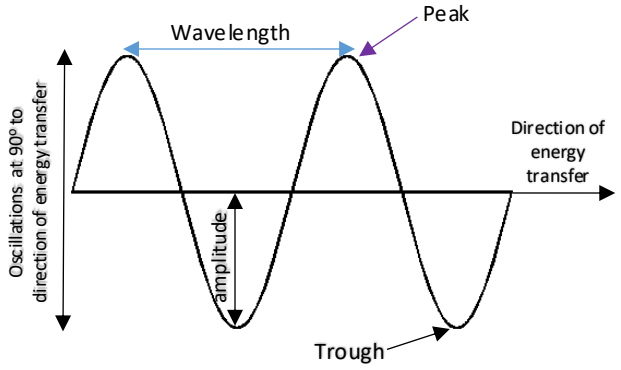
Year 11 Term 1 Science/Physics P6 Waves

Transverse Waves

- Oscillations (vibrations) **perpendicular** to direction of energy transfer.

Examples:

- Electromagnetic waves
- Ripples on water.

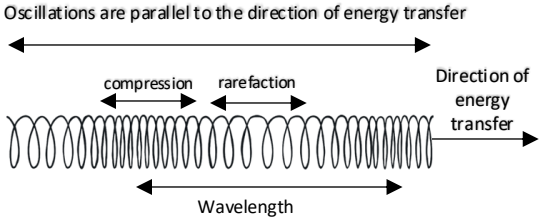


Longitudinal Waves

- Oscillations (vibrations) are **parallel** to direction of energy transfer.

Examples:

- Sound waves



Sound waves have areas of compression and rarefaction.

Compression = particles pushed closer together

Rarefaction = particles are further apart

Properties of Waves

Amplitude – maximum displacement from undisturbed position.

Wavelength – distance from a point on one wave to the equivalent point on the next wave.

Frequency – number of waves passing a point each second.

Frequency is measured in Hertz (Hz)

1Hz = 1 wave per second.

Wave speed – the speed at which energy is transferred through a medium.

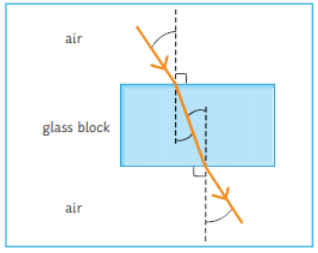
$v = f \times \lambda$ You need to memorise

wave speed (m/s) — frequency (Hz) — wavelength (m)

Refraction

Refraction occurs at the boundary between two mediums because the speed an wavelength of the wave changes at the boundary.

If wave hits medium at an angle of 90° then the ray will slow down but will not be refracted.



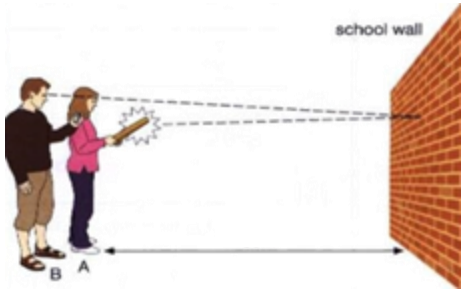
Measuring speed of sound waves in air

- Stand 50m from a large flat wall.
- One person claps/bangs bricks
- Measure time taken to hear the echo.
- Calculate speed of sound using:

Speed = distance x time

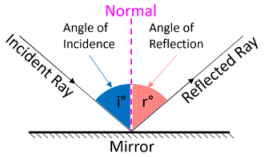
- Remember distance is double (in this case, 100m) as it travels to the wall and back.
- Take several measurements and calculate the mean to reduce error.

This is unlikely to produce an accurate value for sound in air (330 m/s) as the reaction time of the person operating the stopwatch is likely to be a significant proportion of the time measurement.



Reflection

Definition: The change of direction of a light ray or wave at a boundary when the incident ray stays within the medium.



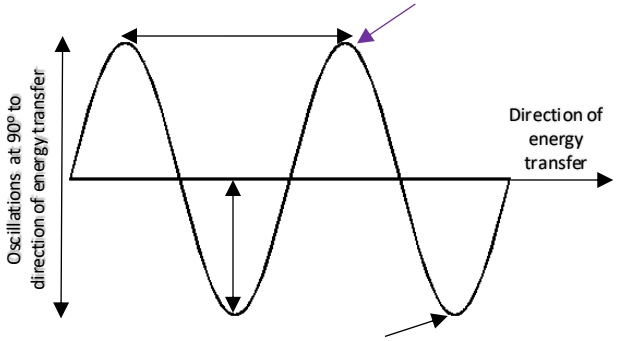
Law of reflection

The angle of incidence = angle of reflection

P6 Waves

1. How are transverse waves produced?

2. Label the wave features below.



1. Describe a longitudinal wave

2. Give an example of a longitudinal wave.

3. Label an area of compression and rarefaction in the diagram below

1. Define the following:

Amplitude

Wavelength

Frequency

2. What are the units for frequency?

3. What is the equation linking frequency, speed and wavelength?

1. When does refraction occur?

2. What happens to the speed, wavelength and frequency of a wave when it is refracted?

1. Describe a method to investigate the speed of sound waves in air.

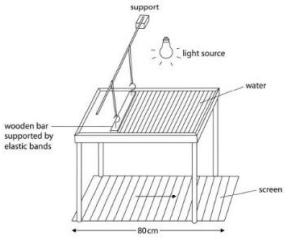
2. What is the biggest source of error in this investigation?

3. What is the speed of sound in air?

1. What is the law of reflection?

P6 Waves Required Practical – investigating wave in a solid and a ripple tank

Measuring waves in a liquid



Equipment

- Ripple tank
- Measuring ruler
- Stop watch

Method

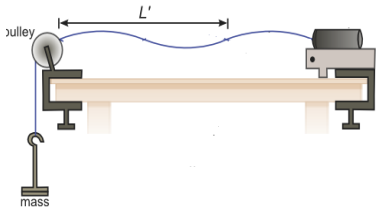
1. Set up the equipment as shown and turn on the motor to produce low frequency waves so that they are able to be counted.
2. Adjust the lamp until pattern is seen clearly on white screen underneath
3. Use a ruler to measure the length of a number of waves (e.g 10) and divide the length by the number of waves to give wavelength. This improves the accuracy of the measurement.
4. Record the waves using a camera or mobile phone. Count the number of waves passing a point in 10 seconds using a stopwatch and slowing the recording down.
5. Divide the number of waves counted by the time to give frequency.
6. Use $v = f \times \lambda$ to calculate the wave speed. Repeat for different frequencies of the motor.

Exp	Length of 10 waves (cm)	Wavelength of 1 wave (cm)	Number of waves in 10 s	Frequency (Hz)	Speed (cm/s)
1	65	0.65	121	12.1	7.9
2	50	0.5	155	15.5	7.9
3	42	0.42	187	18.7	7.9

Measuring waves in a solid

Equipment

- string, vibration generator, hanging mass set and pulley



Method

1. Set up the equipment as shown.
2. Turn on the vibration generator
3. Adjust the length of the string until a standing wave is achieved
4. The frequency can be read from the vibration generator
5. Measure as many complete waves as possible using a ruler
6. Divide the length by the number of waves to give wavelength
7. Calculate speed using $v = f \times \lambda$

Conclusion:

In both experiments, when you increase the frequency, the wavelength decreases – the speed remains the same in the same medium

P6 Waves – Required Practical – Ripple Tank

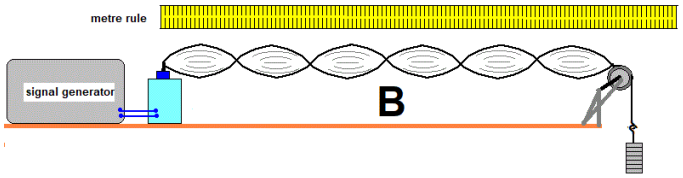
1. Complete the table below to explain the method in calculating the speed of waves in a ripple tank.

Step	Reason
Fill the ripple tank with water, switch on a lamp and place white card underneath the tank.	
Switch on the motor and adjust it to give low frequency waves	
Place a stopwatch next to the card and record the waves, with the stopwatch in view for 10 seconds	
Play the recording in slow motion, count the number of waves passing a certain point and divide this by 10	
Measure the length of 10 waves by taking a picture of the card with a ruler on it.	
Divide the length by 10	

2. If the length of 10 waves is 55cm, what is the wavelength of 1 wave?

3. If there are 210 waves in 10 seconds, what is the frequency?

1. When investigating waves produced by a vibration generator on a string, how do we know the frequency?



2. How many complete waves are shown in the image above?

3. If the length from the generator to the pulley was measured at 66 cm, what is the wavelength?

4. Why is it better to measure multiple waves and divide to find wavelength rather than measure one single wave?

5. What happens to wavelength when frequency increases?

6. What happens to wavelength when frequency decreases?

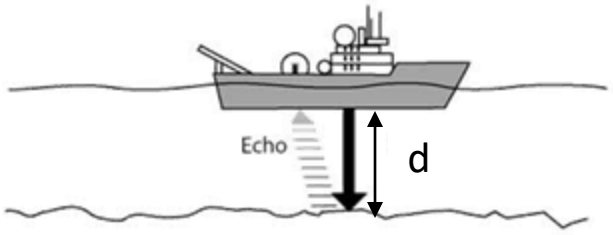
P6 Waves

Sound Waves

- The pitch of a note increases if the frequency of the sound wave increases.
- The loudness of a note increases if the amplitude of the sound wave increases.
- Sound waves cause the eardrum to vibrate, these vibrations send signals to the brain.
- The conversion of sound waves to vibrations of solids only works over a limited frequency rage, limiting the range of frequencies a human can hear. (20-20000 Hz)

Echo sounding

- Uses pulses of high frequency sound waves to measure the depth of objects in deep water.



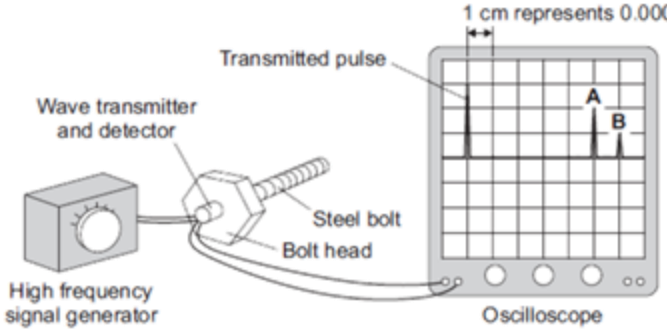
$$d = \frac{1}{2}vt$$

v = speed of the sound wave
t = time between transmitting the signal and receiving the echo.
d = distance to the object

Ultrasound

- Ultrasound waves are sound waves with a frequency above 20 00 Hz.
- Ultrasound waves are partly reflected at a boundary between two different types pf body tissue.
- Ultrasound waves reflected at boundaries are timed, and the timings are used to calculate distances.
- Ultrasound scans are non ionising so are safer than x-rays.

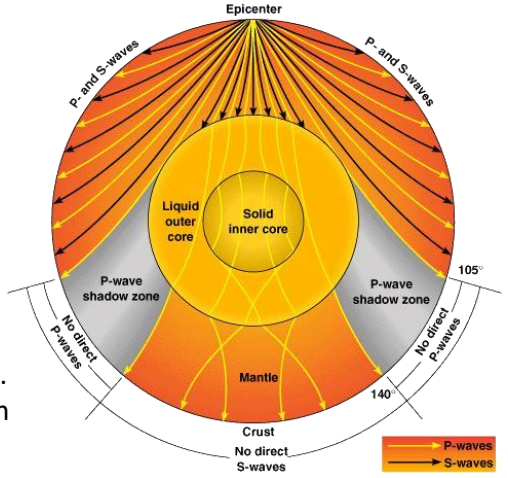
The diagram shows how a very high frequency sound wave can be used to check for internal cracks in a large steel bolt. The oscilloscope trace shows that the bolt does have an internal crack.



- Ultrasound is not only used in medicine, it can also be used to look for flaws or cracks in objects.

Seismic Waves

- Seismic waves are waves that travel through the Earth.
- Seismic waves are produced in an earthquake and spread out from the epicentre.
- Primary seismic waves (P-waves) are longitudinal
- Secondary waves (S-waves) are transverse waves.
- The movement of seismic waves through the Earth following an earthquake provide information on the inner structure of the Earth.
- P waves can movve through solids, but S waves cannot.
- Only P waves are detected opposite the epicentre of an earthquake, suggesting that the centre of the Earth is solid.



P6 Waves

Sound Waves

1. What part of a sound wave is related to the pitch of the note?

2. What part of a sound wave is related to the loudness of a note?

3. What is hearing range of a human?

Ultrasound

1. What frequency are ultrasound waves?Ultrasound waves are sound waves with a frequency above 20 00 Hz.

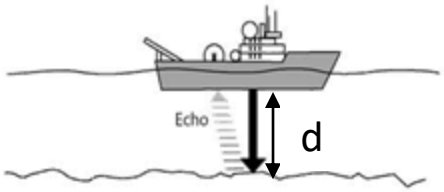
2. What happens to ultrasound waves when they hit a boundary between two mediums?

3. Why are ultrasound scans safer than x-rays?

4. Give a non-medical use of ultrasound waves.

Echo sounding

1. What is echo sounding?



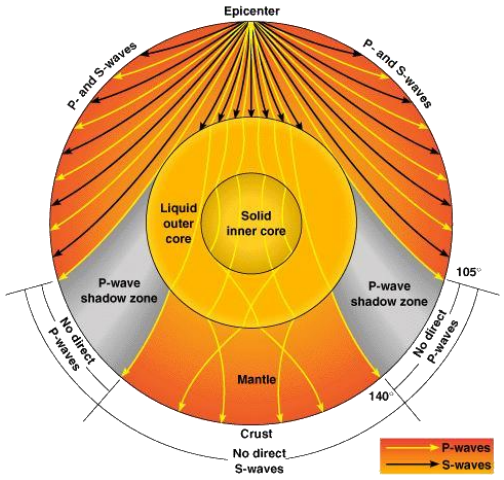
2. What is the equation used to find the depth of the ocean floor (d) under the boat?

Seismic Waves

1. What are seismic waves?

2. What is the difference between a P-wave and an S-wave?

3. What do seismic waves tell us about the structure of the Earth.



P6 Waves

The Electromagnetic Spectrum

- All **transverse waves**
- Transfer energy from the source of waves to an absorber.
- All travel at the same **velocity** through a vacuum or air – **speed of light**.
- Speed of light = 300,000,000 m/s

You must remember all the electromagnetic waves in order!

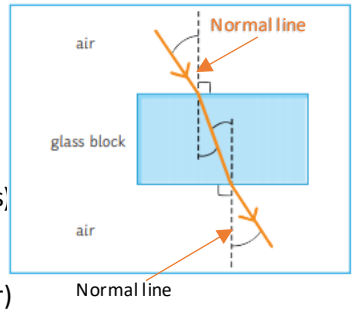
Long wavelength → Short wavelength

Radio waves	Microwaves	Infrared	Visible light	Ultraviolet	X-rays	Gamma rays

Low frequency → High frequency

Wave	Use	Other information
Radio waves	Television and radio	Easily transmitted through the air. Harmless if absorbed by the body.
Microwaves	Satellite communications and cooking food	Can be harmful when internal body cells become heated by over exposure.
Infrared	Electrical heaters, cooking food and infrared cameras	Can cause burns to skin
Visible light	Fibre optic communications	Only EM wave detectable by human eye.
Ultraviolet	Energy efficient lamps, sun tanning	Causes skin tanning and can lead to burns or **skin cancer**.
X-rays	Medical imaging and airport security scanners.	Very little energy is absorbed by body tissues. Passes through the body. They can lead to gene mutation and cancer.
Gamma rays	Sterilising medical equipment or food and treatment for some cancers.	

Ray diagrams

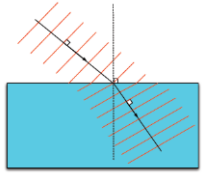


- You need to construct **ray diagrams** to show how a wave is **refracted** at the boundary of a different medium.

Less dense → More dense (e.g. air to glass)
- Ray **slows down** and bends **towards the normal** line.

More dense → Less dense (e.g. glass to air)
- Ray **speeds up** and bends **away from the normal** line.

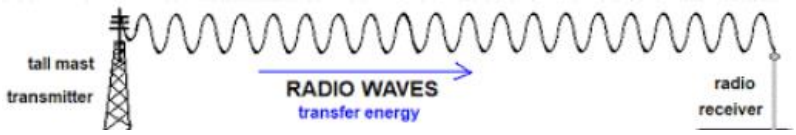
The ray bends because different parts of the wavefront cross the boundary at slightly different times –



If wave hits medium at an angle of 90° then the ray will slow down but will not be refracted.

Radio waves (HT only)

- Radio waves can be produced by **oscillations** in **electrical circuits**.
- Those radio waves can travel for long distances to receivers.
  - When absorbed by the receiver, the radio wave creates an **alternating current** with same **frequency** as the wave itself.
  - This is how TV and radio are broadcast.



P6 Waves

1. State two properties of electromagnetic waves.

2. Write the EM spectrum in order of **increasing** wavelength

3. Write the EM spectrum in order of **increasing** frequency

4. How fast do electromagnetic waves travel?

5. State the uses of:

a) radio waves

b) microwaves

c) infrared

d) visible light

e) ultraviolet

f) x-rays

g) gamma rays

1. What happens when a ray goes from a less dense → more dense medium?

2. What happens when a ray moves from a more dense → less dense medium?

3. What is the line at 90^{o} to a surface called?

4. 4. What happens if a ray hits a medium at 90^{o}?

1. What type of current do radio waves create when absorbed?

2. What is the frequency of the current produced by a radio wave of frequency 250Hz?

P6 Waves – Required Practical – Infrared radiation

Aim

Investigate how the amount of infrared radiation **emitted** (given out) by a surface depends on the nature of that surface.

In this investigation you are finding out which type of surface emits the most infrared radiation:

- **Dark and matt**
- **Dark and shiny**
- **Light and matt**
- **Light and shiny**

Method

1. Place **Leslie cube** on a heat proof mat.
2. Once the kettle has boiled, fill the Leslie cube with water.
3. Hold the infrared thermometer 5cm from the first surface
4. Record the temperature
5. Repeat the experiment three times on each surface and calculate mean for each surface.

Independent variable: surface
Dependent variable: temperature of the air (infrared radiation emitted)
Control variables: Temperature of the water inside, the distance between the cube surface ad the infrared thermometer

In this investigation you are finding out which type of surface absorbs the most infrared radiation:

Method

1. Fill a black and a silver can with water from the tap.
2. Take the temperature of the water in each can
3. Place the infrared thermometer 5cm from the cans
4. Leave for at least 10 minutes
5. Record the temperature of the water in each can and calculate the rise in temperature

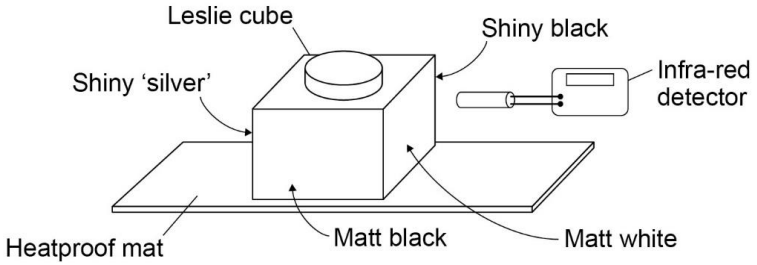
Independent variable: surface of the can
Dependent variable: Temperature increase of the water (infrared radiation absorbed)
Control variables: Temperature of the water inside, the distance between the cube surface ad the infrared thermometer

Conclusion

Black matt surfaces absorb and emit the most infrared radiation.
White/silver and shiny surfaces are poor emitters and poor absorbers of infrared radiation

P6 Waves – Required Practical – Infrared radiation

1. Describe how you could use the equipment below to investigate the emission of infrared by different surfaces.



1. A student was investigating the amount of infrared radiation absorbed by water in cans with different surfaces.

Name the…
Independent variable:

Dependent variable :

Control variables :

2. What kind of surfaces are the best emitters of infrared radiation?

3. Why does the water in the silver can heat up less than the black can?

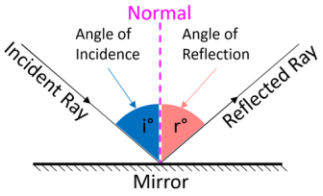
P6 Waves

Reflection

Definition: The change of direction of a light ray or wave at a boundary when the incident ray stays within the medium.

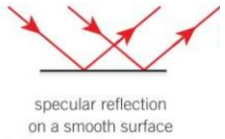
Law of reflection

The angle of incidence = angle of reflection



Specular reflection

Definition: Reflection from a smooth surface. Each light ray is reflected in a single ray.



Diffuse reflection

Definition: Reflection from a rough surface. The light rays are scattered in different directions

Ray diagrams

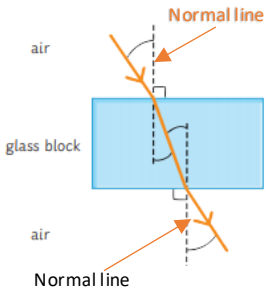
- You need to construct **ray diagrams** to show how a wave is **refracted** at the boundary of a different medium.

Less dense → More dense (e.g. air to glass)

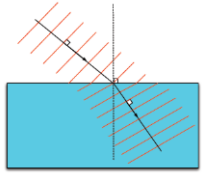
- Ray **slows down** and bends **towards the normal** line.

More dense → Less dense (e.g. glass to air)

- Ray **speeds up** and bends **away from the normal** line.



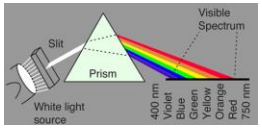
The ray bends because different parts of the wavefront cross the boundary at slightly different times –



If wave hits medium at an angle of 90° then the ray will slow down but will not be refracted.

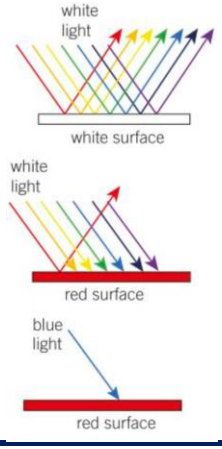
Colour

White light can be split into the colours of the rainbow, each with a different wavelength



Primary and secondary colours

Red + yellow = green
Green + blue = cyan
Blue + red = magenta
Green + blue + red = white



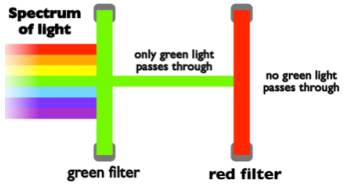
A white object looks white because it **reflects** all the wavelengths of visible light that reach it.

A red object looks red because it **absorbs** all the wavelengths of light except red. Only red light is **reflected**.

If only blue light is shone on a red surface it is **absorbed**, and no light is **reflected**, so the surface looks black

Filters

Filters change the colour objects appear as the only let certain wavelengths of light through. A green **filter absorbs** all colours except green, and **transmits** only green light



P6 Waves

1. What is reflection?

2. Draw a labelled diagram to show reflection of a ray of light by a mirror.

3. What is specular reflection?

4. What is diffuse reflection?

1. What happens when a ray goes from a less dense → more dense medium?

2. What happens when a ray moves from a more dense → less dense medium?

3. What is the line at 90^{o} to a surface called?

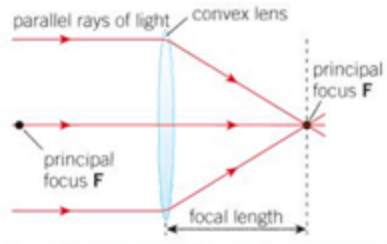
4. 4. What happens if a ray hits a medium at 90^{o}?

1. What are the primary colours of light?

2. Why does a red object look red?

3. Why does a blue filter make everything appear blue?

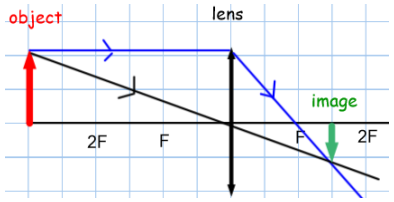
P6 Waves



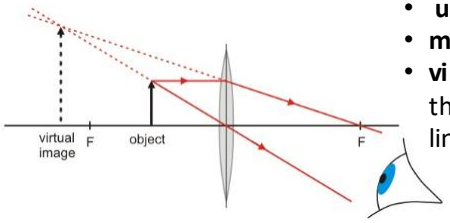
Convex (Converging) Lenses make parallel rays of light converge to meet at the principal focus. Focal length = distance from centre of lens to principal focus

To draw a ray diagram:
Draw two rays from the top of the object

1. A ray parallel to the principal axis, which is refracted through the principal focus.
2. A ray through the centre of the lens, which does not change direction.
3. To create the image, draw an arrow from the principal axis to the point where the rays meet.



The image above is **inverted** (upside down), **diminished** (smaller than the object) and **real** (the rays of light pass through it).

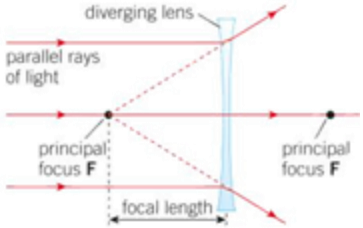


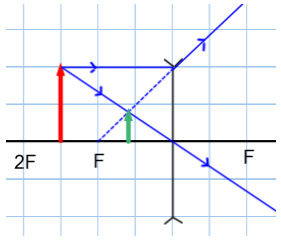
This image is

- **upright** (right way up),
- **magnified** (larger than the object)
- **virtual** (rays of light don't pass through it); represented by dotted lines

Convex lenses can produce **real** or **virtual** images.

Concave (Diverging) Lenses make parallel rays of light diverge (spread out), as if they have come from the principal focus of the lens





To draw a ray diagram:
Draw two rays from the top of the object

1. A ray parallel to the principal axis, which is refracted as if it came from the principal focus on the same side of the lens.
2. A ray through the centre of the lens, which does not change direction
3. To create the image, draw an arrow from the principal axis to the point where these rays appear to meet.

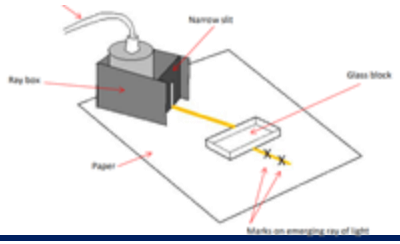
Concave lenses always produce **virtual** images.

Magnification: If the image is bigger than the object the magnification is greater than 1. If the image is smaller than the object, the magnification is less than 1.

Magnification is a ratio and so does not have units.

$$\text{Magnification} = \frac{\text{Image size}}{\text{Actual size}}$$

Required Practical: use different substances and surfaces to investigate refraction and reflection of light



P6 Waves

1. What does a convex lenses do to parallel rays of light?

2. How do you draw a ray diagram for a convex lens?

3. What is a real image?

4. What is a virtual image?

5. What type of does a concave lens produce?

1. What does a concave lenses do to parallel rays of light?

2. How do you draw a ray diagram for a concave lens?

3. What type of does a concave lens produce?

1. What is the formula to calculate magnification?

2. What does a magnification of less than 1 mean?

1. What equipment would you use to investigate the refraction of light through a glass block.

1. What is development?

Term	Definition
Development	The progress of a country in terms of economic growth, the use of technology and human welfare.
Uneven development	Development takes place at different rates in different places.
Development gap	The difference in standards of living and wellbeing between the world's richest and poorest countries.
Quality of life	General wellbeing (includes health, happiness, social belonging…)
Standard of living	Level of wealth and material goods available to people. $
Economic development	Progress in an economy. New technology can lead to a move from agriculture to industry.

Ways to classify the world

LIC	Low income countries. GNI per capita of under $1,045. (Poor) e.g. Haiti.
NEE	Newly Emerging Economies. Countries that have begun to experience high rates of economic development, with rapid industrialisation. e.g. Nigeria
HIC	High Income Countries. GNI per capita of over $12,746. (Rich) e.g. UK.
Brandt line	An outdated line from the 1980's that split the world into rich north and poor south.

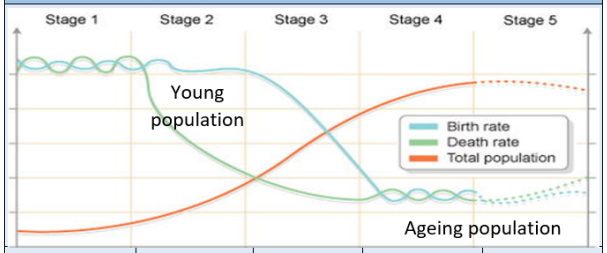
5. Consequences of uneven development

Disparities in wealth	Most developed countries> most wealth Africa owns just 1% of global wealth.
Disparities in health	Health care in LICs poor = ↓ life expect UK LE is 81 years. Nigeria LE is 52 years
International migration	Poor try to migrate to HICs. Mexico into USA. Syrians into Europe. Economic migration also occurs.

2. Measuring development

Term	Cat.	Definition
Arrows show how the indicator changes with development.		
GNI per capita	💰 ↗	Gross National Income per person. Total income divided by the size of the population. - Doesn't show inequality within a country. It's just an average.
Birth rate	🧍 ↘	The number of babies born in a year per 1000 of the population. +Reliable- infers female equality.
Death rate	🧍 ↘	The number of people that die in a year per 1000 of the population. - Less reliable. HICs now have an ageing population- > DR
Infant mortality rate	🧍 ↘	The average number of deaths of infants under the age of 1, per 1000 live births per year.
Life expectancy	🧍 ↗	The average number of years a person might be expected to live. - Less reliable for a LIC due to IMR making it look lower
People per doctor	🧍 ↘	The number of people who depend on a single doctor for their health care needs
Literacy rate	🧍 ↗	The percentage of people who have basic reading / writing skills.
Access to safe water	🧍 ↗	The percentage of people who have access to water that does not carry a health risk such as cholera
HDI	💰 🧍 ↗	Human Development Index. A combined measure that includes GNI per capita, life expectancy and adult literacy rate. Out of 1. + Best indicator as it includes 💰 and 🧍 data. Removes anomalies
Generic limitations		Data can be out of date or unreliable. Inequalities exist within countries.

3. Demographic Transition Model



-	LIC	NEE	HIC	HIC
High BR	High BR	Falling BR	Low BR	Low BR
High DR	Falling DR	Low DR	Low DR	Low DR
Lack of clean water and reliable food = ← DR ← High IMR = ← BR	Farming = ← BR Medical care improves = → DR	Rural / urban migration. Factories not farming = → BR	Women have careers, marry later, contraception = → BR	Very good health care, healthy diets = → DR

4. Causes of uneven development

Cat	Factor	Explanation
Physical	Natural disasters	Government has to spend money rebuilding rather than education. eg Haiti has had EQs and TS
	Land-locked	No coastline. This hindered trade keeping the GNI low. E.g. Nepal.
	Extreme climates	If it's too hot or cold agriculture is difficult. E.g. Thar Desert
Economic	Debt	A country's money will go to repaying debt rather than education.
	Selling primary products	These are low value goods so the government has restricted income to invest in health care.
Historical	Colon-ialism	European countries controlled much of Africa and Asia. After regaining power they were poor and civil wars often occurred. eg Nigeria- UK colony
	War	Money spent on arms. E.g. Sudan

1. What is development?

Term	Definition
Development	
Uneven development	
Development gap	
Quality of life	
Standard of living	
Economic development	

Ways to classify the world

LIC	
NEE	
HIC	
Brandt line	.

5. Consequences of uneven development

Disparities in wealth	
Disparities in health	
International migration	

2. Measuring development

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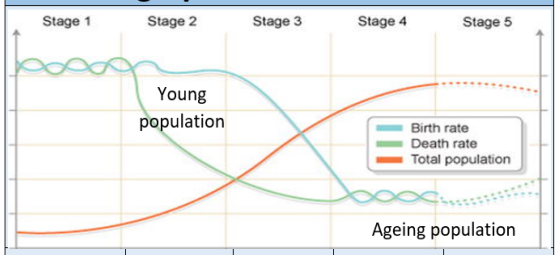
Arrows show how the indicator changes with development.		
GNI per capita	💰 ↗	
Birth rate	👶 ↘	
Death rate	🧍 ↘	
Infant mortality rate	👶 ↘	
Life expectancy	🧍 ↗	
People per doctor	🧍 ↘	
Literacy rate	🧍 ↗	
Access to safe water	🧍 ↗	
HDI	💰 🧍 ↗	
Generic limitations		

3. Demographic Transition Model



-	LIC	NEE	HIC	HIC
High BR	High BR	Falling BR	Low BR	Low BR
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Lack of clean water and reliable food = ← DR High IMR = ← BR	Farming = ← BR Medical care improves = → DR	Rural / urban migration. Factories not farming = → BR	Women have careers, marry later, contraception = → BR	Very good health care, healthy diets = → DR

4. Causes of uneven development

Cat	Factor	Explanation
Physical	Natural disasters	
	Land-locked	.
	Extreme climates	
Economic	Debt	
	Selling primary products	
Historical	Colon-ialism	
	War	

6. Strategies to reduce uneven development — FAT MIDII

Strategy	Explanation	Evaluation
Fairtrade	When producers in LICs are guaranteed a fair price for the goods they produce ie cocoa, coffee. The better price improves income, aids community projects and protects the environment.	+ Improves quality of life - Poorest can't afford certification
Aid	When a country or non-governmental organisation donates resources or money to another country to improve people's lives. Short term emergency aid or long-term aid. Nigeria- NETS4Life.	+ Improves quality of life - Aid may be tied - Corruption of aid
Tourism	Visitors spend money in a country and infrastructure is improved.	- Can be unreliable
Microfinance loans	Very small loans which are given to people in the LICs to help them start a small business. Often to women.	+ Makes women more equal - Can lead to debt
Investment	Countries or TNCs can invest in a country. Might include the development of infrastructure, building dams or industry. Shell.	+ Triggers multiplier effect - Economic leakage can occur
Debt relief	36/39 of the poorest countries have had their debt cancelled if they could guarantee no corruption and they agreed to spend the money on education/ reducing poverty. Nigeria's cancelled 2005.	+ Improves quality of life - They may go into debt again - Corrupt governments…
Intermediate technology	Sustainable technology that is appropriate to the needs, skills, knowledge and wealth of local people. Small scale projects.	+ Affordable - Small scale
Industrial development	Developing the secondary sector. This brings jobs, higher income and infrastructure improvements.	+ Triggers multiplier effect - Environmental damage

7. Tourism to reduce uneven development

Nepal	LIC. GNI per capital of US$1,090. Suffered civil war and earthquakes. Trek (Mount Everest), jungles, culture.
Advantages	+ $445 million in 2015. + 8% GNI. + 500,000 jobs. 7% employment.
Dis-advantages	- Locals are poorly paid. - Economic leakage. - EQ in 2015 reduced tourism by 1/3. Some out of work for 7 months. - Environmental damage (ie O_2 tanks).
Summary	Has been successful but it is unreliable. Need to find a more sustainable method for the long run.

6. Strategies to reduce uneven development — FAT MIDII

Strategy	Explanation	Evaluation
Fairtrade		-
Aid		-
Tourism		-
Microfinance loans		-
Investment		-
Debt relief		-
Intermediate technology		-
Industrial development		-

7. Tourism to reduce uneven development

Nepal	
Advantages	
Dis-advantages	
Summary	

2. The Conquistadors 1513-1528

Balboa the Conquistador

1509
Balboa rescues Spanish expedition in trouble on mainland America.
1510
Founds first permanent settlement on mainland America, Santa Maria de la Antigua del Darien.
1511
Confirmed, by King Ferdinand, as captain general and governor of Darien.
1513
Expedition across Isthmus of Panama – finds the Pacific and claims it and surrounding lands for Spain.
1514
Plans an expedition to sail south on the Pacific. Replaced as governor by Pedrarias.
Arrested for treason, tried and beheaded.

Pedrarias and Espinosa: the significance of Panama

Pedrarias and Espinosa explored the south coast separately, but both ended up on the same point on the Pacific coast – this became Panama.
Panama significant because:
-Situated on Pacific coast – closest in distance to Nombre de Dios on the Caribbean Sea.
-a route between Panama and Nombre de Dios was the quickest way of moving goods, people and messages between the Pacific and the Caribbean sea.
-land surrounding Panama was fertile and had sea rich in fish.
-Panama was a port, well situated for Spanish treasure ships to off-load.

Velázquez conquers Cuba

1511 – Hatuey a native chief living in Haiti, flees to Cuba with 400 natives to escape Spanish cruelty. Velázquez and 300 conquistadors pursue them.

1512 – After strong native resistance, Hatuey is captured and burned alive.

1513 – Massacre at Canao – thousands of natives killed.

1514 – Conquest of Cuba complete. City of Santiago de Cuba founded and becomes capital of Cuba.

1515 – City of Havana founded.

Cortes' expedition to Mexico 1519

1519 February – Cortes sails from Cuba, despite Velázquez attempts to stop him.

March – Lands on Yucatan Peninsula and claims land for Spain.

April – Fights Tabascan natives and takes control of the city of Pontonchon. Makes peace with Tabascans. Given Malinche.

July – Re-establishes a Spanish settlement at Vera Cruz. Cortes also sinks his ships.

August – Cortes is met by cheering natives at Cempoala and allies with them.

September – Fights Tlaxcalans – enemies of the Aztecs – makes peace and allies with them.

Aztec religion

Quetzalcoatl

What beliefs did the Aztecs have towards the Spanish?

Some Aztecs wanted to treat Cortes and the Conquistadors as returning gods; others as dangerous invaders.
Aztecs worshipped many gods. They were usually connected to nature. Human sacrifices were common among the Aztecs.
The god Quetzalcoatl was the god of life. Aztecs believed he had vanished into the sea and would one day return.
Many Aztecs believed that Cortes and the conquistadors were returning gods.
Cortes and the conquistadors appeared from the same sea, and in the same spot, from which Aztecs believed Quetzalcoatl disappeared.

Magellan

Magellan and his ships managed to circumnavigate the world between 1519 and 1522 and claim the Phillipines for Spain.
This was important because:
- It meant that Spain could claim the Spice Islands – as they had found a western route to it.
- It brought prestige to Spain – Magellan and his ships were the first to complete a voyage of global circumnavigation.

Cortes removed as governor

Cortes had many enemies which were causing him problems back in Spain. In 1528 he was removed as governor because:
- Velázquez became a determined enemy.
- Rumours of greed reached the Spanish court.
- The king wanted to control Cortes.

In 1528 Cortes returns to Spain. Charles I was impressed with what Cortes had found but did not trust him. Cortes was no longer governor but he kept his land. An enemy of Cortes was installed so they could keep an eye on both, and to prevent one gaining too much power.

Date	Event
1519	
Feb	Cortes sails from Cuba
March	Lands on Yucatan peninsula and claims land for Spain
April	Fights Tabascan natives and takes control of Pontonchon. Makes peace with Tabascans. Given Mayan woman, Malinche.
July	Re-establishes Spanish settlement at Vera Cruz. Sinks his ships.
August	Met by cheering natives at Cempoala and allies with them.
Sept	Fights Tlaxcalans – enemies of the Aztecs – makes peace and allies with them.
October	Cortes and his forces massacre 3000 natives in the town of Cholula.
8th Nov	Cortes and his forces enter Tenochtitlan – welcomed by Montezuma.
14th Nov	Montezuma taken prisoner by Cortes – becomes a puppet emperor.
1520	
April	Spanish troops arrive at Vera Cruz under instructions from Velázquez, intending to arrest Cortes.
May	Cortes leaves Tenochtitlan to oppose Velázquez's troops. Cortes deputy, Alvarado, massacres thousands of Aztec nobles.
24-29 June	Spaniards trapped in Tenochtitlan as Aztecs rise against them.
29th June	Montezuma killed.
30th June	The Night of Tears: Spaniards are massacred as they flee from Tenochtitlan and spend nearly a year re-grouping and planning.
1521	
22nd May	Battle for Tenochtitlan begins.
1st Aug	Spaniards fight their way into the centre of Tenochtitlan.
13th Aug	Tenochtitlan falls to the Spaniards and the Aztecs surrender.

Cortes strengthens Spanish control

In the years to 1528, Cortes strengthened control in many ways:
-He continued killing Aztecs and natives that supported them.
-He took tribute from remaining Aztec chiefs.
-Tenochtitlan was rebuilt on the ruins of the Aztec city.
-He encourages exploration and establishment of new communities.
-Agriculture was developed.
-Industry was developed.
-He helped with the spread of Christianity.

Aztec priests killed

Temples pulled down

The Spanish impose the encomienda system of landholding

The fall of the Aztec Empire

Aztec leaders killed and Aztecs ruled by Spaniards

Millions of Aztecs die from smallpox

Christian priests and friars convert Aztecs to Christianity

Forced labour kills millions of Aztecs

2. The Conquistadors 1513-1528

Balboa the Conquistador

1509

1510

1511

1513

1514

Pedrarias and Espinosa: the significance of Panama

Velázquez conquers Cuba

1511 –	1512 –
1513 –	1514 –
1515 –	

Cortes' expedition to Mexico 1519

1519 February –	March –	April –
July –	August –	September –

Aztec religion

Quetzalcoatl

What beliefs did the Aztecs have towards the Spanish?

Magellan

Cortes removed as governor

Date	Event
1519	
Feb	
March	
April	
July	
August	
Sept	
October	
8th Nov	
14th Nov	
1520	
April	
May	
24-29 June	
29th June	
30th June	
1521	
22nd May	
1st Aug	
13th Aug	

Cortes strengthens Spanish control

The fall of the Aztec Empire

Year 10 GCSE Religious Education KO - Christianity Practices

Keywords	
Worship	Act of religious honour or devotion
Liturgical worship	Service which follows a set pattern
Non-liturgical worship	Service which does not follow a fixed or set pattern
Sacrament	Rites and rituals through which the believer receives a special gift of grace
Holy communion	A service of thanks giving where bread and wine are consumed to remember Jesus' death and resurrection
Festival	Celebration of Jesus' death and resurrection
Christmas	Celebration of Jesus' birth
Church	The holy people of God, the body of Christ or a building where Christians worship
Agape	Unconditional, unselfish love
Mission	A calling where an individual or group go out and spread the word of God
Missionary	A person sent on a religious mission to promote Christianity in a different country through preaching or charity work
Alpha course	An example of evangelism – trying to tell others about Christianity
Persecution	Hostility or ill-treatment, because of race or religious or political beliefs
Poverty	Restoring of harmony after relationships have broken down

What we are learning in this unit	
A. Worship B. Prayer C. The Sacraments D. Eucharist E. Baptism F. Pilgrimage	G. Christmas H. Easter I Role of the church J. Mission and evangelism K. Persecution L. Reconciliation

C.	*Sacraments*
What is it	• A specific rite or practice which is given to Christians as a symbol of God's grace • The Catholic Church recognises 7 sacraments: **baptism, confession, the Eucharist, confirmation, marriage, holy orders, anointing of the sick** • **More on baptism and eucharist in box D and E**

A.	*Worship*
What is it	• A way for Christians to show love and respect for God • It shows Christians how important God is to them • They worship in different ways
Liturgical worship	• Worship with a set order or pattern • E.g. Roman Catholic Mass • Often takes place in a Church but can be elsewhere
Non-liturgical worship	• Tends to be Bible-based • Often follows a structure but there is free choice in the structure • May choose a relevant theme for the community • Prayer is often in a personal style
Informal worship	*Charismatic worship* • Service has characteristics such as hymns, sermon and prayer but is free-flowing • Can be anywhere, not just the Church • Resembles worship practiced by early Christians • Focus on the Holy Spirit
Private worship	• Takes place individually • Forms a personal relationship with God

B.	*Prayer*
What is it / Significance of prayer	• A means of communicating with God • Purpose is to praise God, confess sins, give thanks to God
The Lord's Prayer	• ***"Our Father, who art in Heaven"*** • Gives a model for how to pray • Involves adoration of God, confession of sins, and petition (asking God for something) • Asking God for food ***"give us this day our daily bread"*** • Asking for forgiveness ***"forgive us our trespasses as we forgive those who trespass against us"***
Set prayers	• Written down and said more than once/regularly • Allows collective nature e.g. Lord's Prayer
Informal prayer	• Use day-to-day language • Often private and focus on reflection • Pentecostal Church are moved by the Holy Spirit so speak in tongues

Year 10 GCSE Religious Education KO - Christianity Practices

Keywords	
Worship	
Liturgical worship	
Non-liturgical worship	
Sacrament	
Holy communion	
Festival	
Christmas	
Church	
Agape	
Mission	
Missionary	
Alpha course	
Persecution	
Poverty	

What we are learning in this unit	
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C.	*Sacraments*
What is it	

A.	*Worship*
What is it	
Liturgical worship	
Non-liturgical worship	
Informal worship	
Private worship	

B.	*Prayer*
What is it / Significance of prayer	
The Lord's Prayer	
Set prayers	
Informal prayer	

Year 10 GCSE Religious Education KO - Christianity Practices

D.	*Eucharist/Holy Communion*
What is it	• Based on the words and actions of Jesus at the Last Supper • ***"Jesus took bread, and when he had given thanks, he broke it and gave it to his disciples, saying, "Take and eat; this is my body".*** • Commemoration of the sacrifice Jesus made on the cross • Deepens faith in Jesus • Christians share bread and wine in Church which represents the body and blood of Christ
Significance	• Some celebrate it weekly • Gives them strength to live every day to God's glory
How is it celebrated	• Sharing bread and wine during a service at the church • Some use grape juice instead of wine
Different interpretations	• Roman Catholics believe in transubstantiation – the bread and wine is actually the body and blood of Christ transformed • Protestants – expression of faith and obedience • Catholic, Orthodox, Anglican– a way to receive God's grace

E.	*Baptism*
What is it	• Involves the candidate being immersed in water or having water poured on them • Symbolises cleansing of sin and initiation into the Church • Lots regard it as necessary to being saved • Jesus told his disciples to ***"go and make disciples of all nations, baptising them in the name of the Father, the Son and The Holy Spirit"***
Significance	• Initiation into the Christian community • Cleansed from sin • Reborn into eternal life • United with Christ as a child of God • Receive the gift of the Holy Spirit
Infant baptism	• When a child/baby is baptised • Holy water is poured over their heads x3 • Washes away original sin, starts life on the right track with God, shows commitment, welcomes to the Church
Believer's baptism	• When an adult is baptised • Whole body is immersed in the water • Follows Jesus' example, start a new life with God, wash away sin, making their **own** decision to be baptised

F.	*Pilgrimage*
What is it	• A visit to a place regarded as holy for the believer • Places of pilgrimage have a special meaning and can make people feel closer to God
Importance	• Lets people take time out from their every day lives • Offers an opportunity for spiritual growth • Encourage them to lead lives that reflect the values of God • Physical or spiritual healing • Deepens their faith – meeting people from different cultures
Lourdes	• Virgin Mary appeared to Bernadette in the 19th century • Believed that the spring water can cleanse pilgrims of sin and cure illnesses • People walk in processions, touch the walls of the grotto, take home Lourdes water • There is a focus on helping and supporting the sick and disabled • People feel healed spiritually, if not physically
Iona	• Island off the west coast of Scotland • Services and tours for pilgrims • **MONASTIC experience =** a simple way of living, i.e. like a monk • Share practical tasks e.g., washing up, discussions, studying the Bible • People do not go here for miracles

G.	*Christmas*
What is it	• Celebrated to commemorate the birth of Jesus • Churches are decorated with the scene of the nativity • Carols are sung about the events of Jesus' birth • Communion takes place at midnight on Christmas Eve
Importance	• Remembering the incarnation • Celebrates the birth of a saviour – his birth lead to people being saved from their sins
In GB today	• Christians thank God for the incarnation • A time of giving and receiving from loved ones • Time to remember those in difficult circumstances – should give and support those in need • Highlights meaning of Christmas to non-believers

H.	*Easter*
What is it	• Remembering Jesus' death and resurrection
Importance	• Remembers the resurrection of Jesus • Power of good over evil • Reminds Christians of the omnipotence of God • Shows Christians there is an afterlife
Lent	• Time of preparation for Easter – reminds Christians of the temptations of Jesus
Maundy Thursday	• Last Supper • Observed today by Eucharist
Good Friday	• Remembering crucifixion of Jesus • Observed today by worshiping together
Easter Sunday	• Celebrates Jesus rising from the dead • Shows there is an afterlife and death is not the end

Year 10 GCSE Religious Education KO - Christianity Practices

D.	*Eucharist/Holy Communion*
What is it	
Significance	
How is it celebrated	
Different interpretations	

E.	*Baptism*
What is it	
Significance	
Infant baptism	
Believer's baptism	

F.	*Pilgrimage*
What is it	
Importance	
Lourdes	
Iona	

G.	*Christmas*
What is it	
Importance	
In GB today	

H.	*Easter*
What is it	
Importance	
Lent	
Maundy Thursday	
Good Friday	
Easter Sunday	

GCSE Religious Education KO - Christianity Practices

I.	*Role of the Church: Local community*
Local community	• Churches help in the local community in a number of ways: food banks, day centres for the elderly, helping refugees, food banks, soup kitchens, helping people with taxes • ***Parable of the sheep and the goats:*** Jesus told his disciples that they should help others • ***"If anyone has material possessions and sees his brother in need but has no pity on him, how can the love of God be in him?"*** • Jesus deliberately sought out people in society who needed help
Food banks	• People volunteer to collect, sort and distribute food • People in need are identified and are provided with vouchers to exchange • The salvation army - soup kitchens and hostels, give emergency assistance, provide community vegetable gardens
Street pastors	• Christians who go out on the streets of cities to help care for the needs of young people • NOT there to spread Christianity, just to help • E.g. St. Vincent de Paul Society – help anybody who needs it – give training to get jobs, run community shops, run hostels, soup kitchens

I.	*Role of the Church: Worldwide*
Working for reconciliation	• Christians need to be reconciled with God but also with one another • Christians believe that Jesus' death was an act of reconciliation • Worldwide church has a role to restore people's relationship with God and with one another • Working for reconciliation is necessary for all Christians
Persecution	• Hostility and ill-treatment, especially because of race, or political or religious beliefs • Jesus told Christians to expect persecution because if they persecuted Jesus, they would also persecute his followers • Those who suffer for their beliefs share in the suffering of Jesus ***"to know the power of his resurrection and participation in his sufferings"*** • Persecution helps the church grow because people witness the hope that Christians have • ***"if one part suffers, every part suffers with it"*** – all Christians suffer together so need to be supported • Church supports people by smuggling in Bibles, giving legal and financial support, provide spiritual support, raise awareness of those being persecuted
CAFOD	• Catholic agency for Overseas Development (CAFOD) • Works to bring hope and compassion to people of all faiths and in poor communities • Action needs to be taken to remedy the injustice of people suffering • Helps to increase access to clean water, education and healthcare, lobbies employers to adopt fait working conditions.

J.	*Mission and evangelism*
Mission	• Vocation or calling of a religious organisation or individual to go out into the world and spread their faith • ***"go and make disciples of all nations… teaching them to obey everything I have commanded you"*** • Christians have the responsibility, according to the Great Commission, to tell others of their faith • Spreading the word to people in everyday life, organised events, preaching, becoming missionaries, humanitarian work
Evangelism	• Spreading the message of Christianity and teachings of Jesus in order to make **disciples of all nations** • Bring reconciliation between people and God • Show the love of God through their own actions • Preaching, teaching, performing missions and good works openly, move to foreign lands to spread the word, set up churches and church communities
The Alpha Course	• Aims to help church members understand the basics of the Christian faith • Many major Christian organisations use it • Take place in church premises but also in homes, universities, workplaces, prisons and other venues • Courses include topics such as relationship and marriage for adults and study programmes for young people

K	*Persecution*
	• Hostility and ill-treatment of a group of people • Jesus told Christians to spread the word of Christianity – may put them in danger – ***"he who endures to the end will be saved"*** • Open Doors and Christian Freedom Internation help persecuted Christians • Support them through trauma, provide advice and support, speak on behalf of persecuted Christians to raise awareness, send/smuggle in Bibles, lobby the governments for political power, organise the offer of aid to persecuted, offer rooms to asylum seekers, ask god to forgive the persecuters • Turn the other cheek

L	*Reconciliation*
How the church works for reconciliation	• Set up initiatives to bring people together, working in prisons to lead people back to God and bring the victim and perpetrator back together, leading sermons, asking congregation to forgive each other
WHY they work for reconciliation	• Jesus' sacrifice, parable of the forgiving father, ***"love thy neighbour",*** he who sees his brother in need and does nothing, how can the love of God be in him?

GCSE Religious Education KO - Christianity Practices

I.	*Role of the Church: Local community*
Local community	
Food banks	
Street pastors	

I.	*Role of the Church: Worldwide*
Working for reconciliation	
Persecution	
CAFOD	

J.	*Mission and evangelism*
Mission	
Evangelism	
The Alpha Course	

K	*Persecution*

L	*Reconciliation*
How the church works for reconciliation	
WHY they work for reconciliation	

Year 10 GCSE Religious Education KO - Islam Beliefs

Keywords	
Tawhid	The belief in Islam that there is only one God who created everything
Omnipotent	God is all powerful and "has power over everything"
Immanent	God is active in the world and involved in its' creation.
Transcendent	God is outside of time and space. God cannot age or die or be located in one place.
Beneficient	Allah is compassionate, caring and good
Sunnah	The traditions and practices of the Prophet Muhammad
Qur'an	The Islamic sacred book
Hadith	A collection of traditions and sayings of the Prophet Muhammad
6 Articles of Faith	6 basic beliefs that shape the Islamic way of life
5 Roots of Usul Ad-Din	5 rules which explain how Muslims should act in daily life
Akhirah	Belief in the afterlife
Al Qadr	Supremacy of God's will and The belief in predestination which is slightly different for Sunni and Shi'a Muslims

What we are learning in this unit

A. 6 Articles of Faith
B. 5 Roots of Usul Ad-Din
C. Sunnah and Hadith
D. Risalah
E. Torah, Psalms and Gospels
F. Nature of Allah
G. Qu'ran
H. Torah, Psalms and Gospels
I. Angels
J. Al Qadir
K. Day of Judgement, Paradise and Hell

B. *5 Roots of Usul Ad-Din*

The 5 roots of Usul ad-Din are central to the Shi'a Muslim faith.

Root	What is it?	Quote
1: Tawhid	The belief in the oneness of Allah	"He is God the One, God the eternal" Surah 112
2: Nubuwwah	Belief in prophethood: the chain of messengers from Adam to Muhammad	"We sent messengers to every community" Surah 16
3: Adl	Allah is just (fair) and will bring Divine Justice	"I advise you to being just towards both friend and foe" Imam Ali
4: Imamah	A term for God-given leadership	"obey God and the Messenger, and those in authority among you"
5: Mi'ad	The day of judgement and resurrection	"His is the judgement; and to Hjm you shall be returned"

A. *6 Articles of Faith*

Article of faith	What is it?
1: Belief in one God	Allah is the creator and sustainer of life. There is no God but Allah
2: Belief in Angels	Angels do the work of Allah and do not have free will like humans. They obey Allah
3: Belief in God's revealed books	The Torah, the Psalms, the Gospels, the Scrolls of Abraham and the Qur'an.
4: Belief in the messengers of God	Prophets and messengers are chosen by Allah to deliver His message to humankind
5: Belief in the Day of Judgement	There will be a day when all people stand in front of Allah and are sent to Heaven or Hell
6: Belief in pre-destination	Allah knows everything. Everything is ordered by Allah – nothing is random or by chance

C. *Sunnah and Hadith*

Sunnah	• The practices, customs and traditions of Prophet Muhammad • They give an example for Muslims to follow • The Sunnah and Hadith are sources of Wisdom and authority alongside the Qur'an
Hadith	• Reading the Hadith helps a Muslim to learn how Muhammad explained the teachings from the Qur'an • The Hadith makes the Qur'an easier to understand
What does the Sunnah tell Muslims?	• The Sunnah covers many areas of life • It provides a guideline for Muslim life • There is a Sunnah for everything

Year 10 GCSE Religious Education KO - Islam Beliefs

Keywords	
Tawhid	
Omnipotent	
Immanent	
Transcendent	
Beneficient	
Sunnah	
Qur'an	
Hadith	
6 Articles of Faith	
5 Roots of Usul Ad-Din	
Akhirah	
Al Qadr	

What we are learning in this unit

A. 6 Articles of Faith
B. 5 Roots of Usul Ad-Din
C. Sunnah and Hadith
D. Risalah
E. Muhammad
F. Nature of Allah
G. Qu'ran
H. Torah, Psalms and Gospels
I. Angels
J. Al Qadir
K. Day of Judgement, Paradise and Hell

B. *5 Roots of Usul Ad-Din*

.

Root	What is it?	Quote
1:		
2:		
3:		
4:		
5:		

A. *6 Articles of Faith*

Article of faith	What is it?
1:	
2:	
3:	
4:	
5:	
6:	

C.	*Sunnah and Hadith*

Year 10 GCSE Religious Education KO - Islam Beliefs

D.	*Risalah (Prophethood)*
What is it	• Muslims believe there has been 124,000 prophets • Every Islamic prophet preached Islam and key beliefs • The first was **Adam,** the last was Muhammad (Box E)
Why are prophets important?	• Prophets are guided by Allah • Their love of Allah stops them from sinning • Some prophets are messengers who have been given revelation of news
Adam	• The first prophet • The father of all humankind • He taught about the work of Iblis and how to protect themselves • He taught life on Earth was temporary, eternal life is in the next life • He built the Ka'aba as the first place of worship
Ibrahim	• Ibrahim was told in a dream to sacrifice Isma'il as a test of faith – remembered at Hajj every year • His son **Isma'il** is the ancestor of the prophet Muhammad

E	*Torah, Psalms and Gospels*
Psalms (Zabur)	• The Psalms of Dawud are a collection of prayers to Allah • They contain lessons of guidance for the people
Gospel (Injil)	• This is the good news about Isa (Jesus) • Muslims highly respect Isa because there are revelations in the Qur'an about him • Muslims believe he was the Masih, he was not the son of Allah, he was not crucified, he did not die to save sins • The gospels contain some mistakes because they were written many years after Isa died
Torah (Tawrat)	• The Tawrat is the Arabic word for the Torah • These are the revelations given to Moses by Allah on Mt Sinai • The Qur'an refers to the Tawrat as "guidance and light"
Scrolls of Ibrahim	• Revelations received by Ibrahim on the first day of Ramadan • Contained stories about workship and reflection • Not a book, individual revelations

F.	*The Nature of Allah*
Tawhid	• There is only one God and this God has no equal. • He created everything. • Only He should be worshipped: worshipping other Gods is a sin called **shirk.** • ***"There is no God but Allah, and Muhammad is his messenger".*** • ***"Allah witnesses that there is no deity except Him"*** • ***"Do they not see that Allah, who created the heavens and the Earth and was not wearied by their creation, has the power to raise the dead to life?"***
2: Omnipotent	Allah is all powerful and has power over everything
3: Immanence	Allah is active in the world and able to control events
4: Transcendent	• Allah is outside of the universe • Not limited by time or space
5: Beneficience	God has love and good will
6: Mercy	• ***"In the name of Allah, the most compassionate, the most merciful"*** • God is forgiving and caring
7: Fairness and justice	• Allah is fair to all people • ***Allah has sent the same message to all prophets to allow humans numerous opportunities to submit to the will of Allah*** • Allah will ensure that judgement is fair and punishments are suitable

Year 10 GCSE Religious Education KO - Islam Beliefs

D.	*Risalah (Prophethood)*
What is it	
Why are prophets important?	
Adam	
Ibrahim	

E	*Torah, Psalms and Gospels*
Psalms (Zabur)	
Gospel (Injil)	
Torah (Tawrat)	
Scrolls of Ibrahim	

F.	*The Nature of Allah*
Tawhid	
2: Omnipotent	
3: Immanence	
4: Transcendent	
5: Beneficience	
6: Mercy	
7: Fairness and justice	

Year 10 GCSE Religious Education KO - Islam Beliefs

G.	*Qur'an*
Revelation	• Chapters of the Qur'an were revealed to Prophet Muhammad over 13 years in Makkah • While Muhammad received the revelations, he was not able to change them because it was the will of Allah • After Muhammad received them, he recited them, and somebody wrote them down.
Authority	• It is the direct word of Allah so it has His authrotiy • It is without error and remains in its' original form • A written book was needed to formalise the religion
What does it contain?	• It covered every aspect of life • It influences a person throughout their lives • The basics of worship which Muhammad developed • Shari'ah law and social systems • It explains creations and other ultimate questions
Supreme authority	• The Qur'an is believed to have supreme authority • It is a timeless book – it is only the word of Allah if it is not translated from Arabic

I.	*Angels*
What are they?	• Angels are made from light and have wings which can move at the speed of light • They have no gender and are in the unseen world • They always complete what Allah asks and they always obey Allah as they have no free will
What do they do?	• Watch over humans • Bring peace to believers and instill fear in non-believers • Angel of Death takes the soul at death • Greet people entering paradise or throw people into the pits of hell • Signify the end of the world by blowing a horn
Jibril	• Most important angel in Islam • Always brings good news • Helped Ibrahim when he was thrown in to a fire, opened up the Zamzam well for Hajar • Told Maryam she would have a son (Isa) • Dictated the Qur'an directly from Allah
Mika'il	• Assisted Muhammad with his spiritual mission • Giver of rain and sustenance – in charge of plants and rain • Helped Muhammad to fight for Makkah • Will help to weigh peoples' actions on Judgement Day • Mika'il prepared Muhammad by providing Jibril with purifying water

K.	*Day of Judgement, paradise and Hell*
What will happen?	• Muslims believe Judgement day will come on a Friday (Adam was created on a Friday) • It will be announced by Israfils' trumpet • Allah will refer us to the book of deeds to justify damnation or salvation • Humans will go to paradise or Hell
Jannah	• Paradise • No growing ill, old or dying – it is a reward and gift from Allah • A person must live religiously and ask Allah for forgiveness • Good beliefs and actions • It is beyond human imagination
Entry to Jannah	• ***"enter among my servants! Enter my paradise!"*** • People will arrive over the As-Sirat bridge • There are 8 gates and you go through the one which represents your best action • Two angels welcome people saying ***"peace be upon you"***
Jahannam	• Hell • People wail in misery, 70x hotter than any flame on earth, boiling water poured on their heads, pain, dragged in chains • Punishment for a life full of evil or rejecting the teachings of the Qur'an

J.	*Al Qadir*
• Everything happens as a result of Allah's will and nothing is ever random or without reason • Allah is in charge of everything • Everything is a part of Allah's plan • ***"never will we be struck except by what Allah has decreed for us"***	

E.	*Muhammad*
Why was he chosen?	• Muhammad had characteristics such as responsibility, determination, patience, courage and honesty • He was highly respected in his community • He was extremely devoted to Allah – he prayed and fasted for long periods of time
What did he do as a prophet?	• He became the ruler of Madinah and set up the first Islamic community • He converted the people of Makkah to Islam
Why is Muhammad important?	• He is seen as the perfect role model as he is trustworthy and obedient to Allah • His influence can still be seen in the Hadith and Sunnah • The night of power in Ramadan is to remember Muhammad's first revelation from the angel Jibril

Year 10 GCSE Religious Education KO - Islam Beliefs

G.	*Qur'an*
Revelation	
Authority	
What does it contain?	
Supreme authority	

I.	*Angels*
What are they?	
What do they do?	
Jibril	
Mika'il	

K.	*Day of Judgement, paradise and Hell*
What will happen?	
Jannah	
Entry to Jannah	
Jahannam	

J.	*Al Qadir*

E.	*Muhammad*
Why was he chosen?	
What did he do as a prophet?	
Why is Muhammad important?	

Year 10 GCSE Religious Education KO - Christianity Beliefs

Keywords	
Ascension	Jesus returning to be with God in Heaven after the crucifixion
Atonement	Making things better after sinning, asking for forgiveness from God
Benevolent	God's nature as all-loving
Crucifixion	Jesus' execution by the Romans on the cross
Incarnation	God becoming flesh in the form of Jesus Christ
Just	God's nature as fair
Omnipotent	God's nature as all-powerful
Original sin	The built-in tendency to do wrong which comes from Eve's disobedience
Resurrection	Jesus returning from the dead after he was crucified
Salvation	Being saved from sin and given eternal life in heaven by God
Sin	Any thought or action which goes against God's will
Trinity	God's nature as three-parts-in-one, the Father, Son and Holy Spirit.

What we are learning in this unit

A. Nature of God
B. Evil and suffering
C. The Holy Trinity
D. Creation
E. Resurrection, judgement, Heaven and Hell
F. Incarnation
G. Crucifixion
H. Christ in Salvation
I. Ascension and resurrection
J. Sin and salvation

A.	*The Nature of God*	*How is it shown in The Bible?*
One God	• Christians believe in one God who is the creator and sustainer of all that exists	• ***"the Lord he is God; there is none else beside him"***
Omnipotent	• God is almighty and has unlimited power • Nothing can defeat the power of God	• ***"For nothing is impossible with God"*** • The creation of the universe • miracles performed by Jesus • Sending the 10 plagues to Egypt to help the Hebrews be free
Benevolent	• God is all-loving and all-good • "agape" refers to a self-giving, sacrificial love	• ***"For God so loved the world, he gave his One and Only Son"*** • Jesus' death on the cross is an example of that love • The Parable of the Prodigal Son – the father forgave his son because he loved him how God is also loving
Just	• God is perfect and a fair judge	• ***"he is faithful and righteous to forgive us our sins"***
Problem of suffering	• If God is **benevolent**, why would he allow bad things and suffering to happen to innocent people? • Some Christians argue that if God is **fair** and **just**, why does he allow suffering?	

B.	*Evil and suffering*
What is the problem of evil	• There is evil and suffering going on in the world • suffering is physical or emotional pain a person goes through for any reason • Christians may find it difficult to make sense of God allowing suffering to happen
How do Christians solve the problem of evil and suffering?	• Human beings have free will and have the ability to choose their own actions - God doesn't cause it, humans do • Jesus Christ suffered on the cross and Christians believe they can learn from suffering too • Christians believe they get rewarded for suffering in Heaven • "God works in mysterious ways" – we cannot understand God • **Job –** there is sin in the world, we need to keep faith

C.	*The Holy Trinity*
What is it?	• The concept of the three persons of God • Each person of the Trinity is fully God, but they are not the same • ***"we believe in one God, Father, Son and Holy Spirit"***
God The Father	• God of the Old Testament – creator, ruler, judge • The creator of all life
God The Son	• Jesus Christ – both fully human and fully God • God became incarnate through Jesus
The Holy Spirit	• The unseen power of God at work in the world • e.g. answering prayers, guides and comforts Christians
Why is the trinity important?	• It expresses who God is • It expresses how humans can interact with God • It allows humans to come face to face with God • Helps to make the best sense of what Christians read in the Bible • When Jesus was baptised, the Holy Spirit descended like a dove and said ***"you are my Son…"***

Year 10 GCSE Religious Education KO - Christianity Beliefs

Keywords	
Ascension	
Atonement	
Benevolent	
Crucifixion	
Incarnation	
Just	
Omnipotent	
Original sin	
Resurrection	
Salvation	
Sin	
Trinity	

What we are learning in this unit

A. Nature of God
B. Evil and suffering
C. The Holy Trinity
D. Creation
E. Resurrection, judgement, Heaven and Hell
F. Incarnation
G. Crucifixion
H. Christ in Salvation
I. Ascension and resurrection
J. Sin and salvation

A.	*The Nature of God*	*How is it shown in The Bible?*
One God		
Omnipotent		
Benevolent		
Just		
Problem of suffering		

B.	*Evil and suffering*
What is the problem of evil	
How do Christians solve the problem of evil and suffering?	

C.	*The Holy Trinity*
What is it?	
God The Father	
God The Son	
The Holy Spirit	
Why is the trinity important?	

Year 10 GCSE Religious Education KO - Christianity Beliefs

D.	*Creation*
Beliefs about creation	• The trinity must have existed before creation • The trinity is the way in which the world was created
Genesis 1:1-3	• ***"In the beginning, God created the Heavens and Earth"*** • God created Earth and all living things • Christians believe that everything created ***"was good"*** • Most Christians interpret the story as a way of describing the creation of the world • Not all believe it was in literally 6 days • ***"now the Earth was formless and empty, darkness was over the face of the deep and the Spirit of God was hovering over the face of the waters"***
John 1:1-3	• ***"In the beginning was the Word, and the Word was with God"*** • 'The Word' refers to God the Son. This shows the Son (Jesus) was involved in creation
Messages from the story	• God is the omnipotent creator • Every aspect of God's creation is good • The world is sacred • Humans have stewardship and dominion – they have authority over the rest of the world • Humans are made in the image of God

E.	*Resurrection, judgement, Heaven and Hell*
What is Resurrection	• Jesus overcame death through resurrection • If Jesus lived after death, then so will they • Makes Christians treat their body as a ***"temple of the Holy Spirit"***
What do Christians mean by resurrection	• Some Christians believe that God will raise them back to life before Judgement Day • Catholics believe in purgatory – where the soul goes after death to be purified.
Judgement	• There will be a Judgement Day at the end of time and will be judged by Jesus according to how they behaved • Jesus ***"will come again in glory to judge the living and the dead*** • After judgement, they will wait to be rewarded with Heaven or punished with Hell • The Parable of the rich man and Lazarus – ignoring the needs of others has eternal consequences • The Parable of the sheep and the goats – on Judgement Day, some will be rewarded with Heaven for helping others and others are sent to Hell
Heaven	• Heaven is being with God outside time and space • Eternal happiness with no suffering • Heaven is a state of being
Hell	• Hell is eternal separation from God • ***"God predestines no one go to hell; for this, a wilful turning away from God… is necessary and persistence in it until the end"*** • Some Christians reject any idea of hell because they think it would mean God's love would not triumph over evil

F.	*Incarnation*
What is it	• God took on human form as Jesus Christ • ***"The Word became flesh and lived for a while among us"*** • Jesus was fully divine and fully human
Jesus as the Son of God	• Mary was impregnated by the Holy Spirit and gave birth as a virgin – proof that Jesus is the son of God
Belief in incarnation	• The incarnation is important to teach Christians how to live

Year 10 GCSE Religious Education KO - Christianity Beliefs

D.	*Creation*
Beliefs about creation	
Genesis 1:1-3	
John 1:1-3	
Messages from the story	

E.	*Resurrection, judgement, Heaven and Hell*
What is Resurrection	
What do Christians mean by resurrection	
Judgement	
Heaven	
Hell	

F.	*Incarnation*
What is it	
Jesus as the Son of God	
Belief in incarnation	

Year 10 GCSE Religious Education KO - Christianity Beliefs

I.	*Ascension and resurrection*
Resurrection	• Jesus was buried in a rock tomb and left there due to the Sabbath • When the women returned for the burial, Jesus' body was gone • Jesus appeared for the next 40 days to his disciples and other believers
Ascension	• Jesus appeared to his disciples and told them to spread the word of him • The time between resurrection and ascension reminds Christians that God will forgive sins and they can become closer to God • The ascension happened 40 days after the resurrection • It assures Christians they will rise again after death and live in the afterlife
Why is Jesus' resurrection important	• Christians interpret the resurrection as proof that he is the Son of God • Shows God's triumph over evil and death

G.	*Crucifixion*
Why was Jesus crucified	• Jesus was arrested and convicted of blasphemy • He was sentenced to death by Pilate • Crucifixion was a humiliating method which is slow and agonising
How does it influence a Christian	• By accepting Jesus' sacrifice, their sins will be forgiven and they will go to Heaven • Suffering is a part of life
Why did Jesus have to die?	• Blasphemy – some of the things he said and did were considered blasphemy and threatened authority • Pilate – Pilate was going to pardon him but was afraid of the consequences from Rome • God – Jesus had to die to fulfil God's commands for him – this way, humans could be reunited with God

I.	*Sin and salvation*
Original sin	• Christians believe humans are separated from God due to original sin which they have due to Adam and Eve (Genesis) • God in Christ offered salvation
Salvation through law	• Jews thought they needed to obey the law to be accepted by God • Some Christian groups claim salvation depends on keeping to all the rules that are put in place • However some say that the thoughts in our mind and love in our hearts for God is more important
Grace and spirit	• Grace = unconditional love that God shows to everyone, even when it seems undeserved • God loves humans despite what we do or do not do • **Parable of the Prodigal Son** = the son did not deserve the forgiveness, but that is how God treats humanity • Jesus' actions made forgiveness for the sins of the world and reconciliation possible • Christians believe they receive God's grace through the presence of the Holy Spirit

H.	*Christ in salvation*
Atonement	• Christians see Jesus' death as atonement
Reconciliation	• Reconciliation is the restoration of relationships • The relationship between God and human beings was damaged • Human beings need to be reconciled with God to get to Heaven • God sacrificed his Son to allow this to happen

Year 10 GCSE Religious Education KO - Christianity Beliefs

I.	*Ascension and resurrection*
Resurrection	
Ascension	
Why is Jesus' resurrection important	

G.	*Crucifixion*
Why was Jesus crucified	
How does it influence a Christian	
Why did Jesus have to die?	

I.	*Sin and salvation*
Original sin	
Salvation through law	
Grace and spirit	

H.	*Christ in salvation*
Atonement	
Reconciliation	

Year 10 GCSE Religious Education KO - Islam Practices

Keywords	
Tawalla	Showing love for God and for those who follow Him
Tabarra	Disassociation with God's enemies
Khums	The obligation to pay one-fifth of acquired wealth
Lesser jihad	The physical struggle or holy war in defence of Islam
Greater jihad	The **daily** struggle and inner spiritual striving to live as a Muslim
Sunni	Muslims who believe in the successorship of Abu Bakr, Umar, Uthman and Ali as leaders after the Prophet Muhammad
Shi'a	Muslims who believe in the Imamah, leadership of Ali and his descendants
Niyyah	Intention during prayer - having the right intention to worship God
Du'a	A personal prayer that is done in addition to Salah e.g. asking Allah for help

What we are learning in this unit

A. The 5 Pillars and 10 Obligatory Acts
B. Salah
C. Sawm
D. Zakah
E. Hajj
F. Jihad
G. Id-ul-Adha
H. Id-ul-Fitr

A.	*5 Pillars of Islam and 10 obligatory acts*
What are the 5 pillars	• 5 key practices or duties for Muslims • Both Sunni and Shi'a keep these (Shi'a have them as part of the 10 obligations) • They are seen as pillars "holding up the religion" and are all of equal importance
What are the 10 obligatory acts	• There are 10 obligations for a Muslim according to the Shi'a branch of Islam. • These include prayer, fasting, almsgiving, pilgrimage, jihad, khums, directing others towards good, forbidding evil, tawalla and tabarra
Shahadah	• Shahadah is the first of the 5 pillars • It is the Muslim declaration of faith • ***"there is no God but Allah, and Muhammad is His messenger"*** • This is a statement that Muslims reject anything but Allah as their focus of belief • It also recognises that Muhammad has an important role and his life is an example to follow

	Jihad

Lesser Jihad	• Originated when Prophet Muhammad and early Muslims were being attacked and oppressed by the Meccans and had no choice but to engage
	• ***"Fight in the way of God those who fight against you but do not transgress"***
	• Conditions for declaration
	  • self-defense
	  • proportionate
	  • legitimate authority
	  • no harm to civilians

Greater Jihad	• A struggle within oneself to follow the teachings of Islam and be a better person • e.g. perform the Five Pillars, follow Sunnah and avoid temptation • ***"encourage what is right and forbid what is wrong"***

B.	*The 5 Pillars - Salah*
What is it?	• ***"Salah is a prescribed duty that has to be performed at the given time by the Qur'an"*** • ***Muslims pray 5 times per day and this allows them to communicate with Allah.*** • The prayers are done at dawn (fajr), afternoon • (zuhr), late afternoon (asr), dusk (maghrib) and night (isha) • Muslims face the holy city of Makkah when paying.
Wuzu	• The washing process to purify the mind and body for prayer • Muhammad said the key to Salah is cleanliness • Hands, arms, nose, mouth, head, neck and ears are cleaned as well as both feet up to the ankle.
Rak'ahs and recitations	• These are the movements that Muslims make during prayer • Takbir – raise hands to ears and say 'Allahu Akbar' • Qiyam – Standing, Muslims recite Surah • Then bow to the waist saying ***"Glory be to my Great Lord and praise be to Him"*** • Then sink to their knees saying ***"Glory be to my Lord, The Most Supreme…".***
Salah at home	• Salah is a big part of family life • Meals and other activities are usually scheduled to fit around prayer times • Families pray all together and might have a room set aside for prayer
Salah in the mosque	• All mosques have a qiblah wall which is to show where to face Makkah • Men and women pray in separate rooms at the Mosque
Jummah	• Jummah is congregational prayer held on a Friday at the mosque where the imam leads the prayer • Praying together as a community develops the feeling of unity amongst Muslims • Men are obliged to attend unless they are sick or too old • Women do not have to go – they may pray at home instead
Differences between Sunni and Shi'a	• Shi;a Muslims combine some prayers so they may only pray 3x a day • Shi'a use natural elements e.g. clay where their head rests

Year 10 GCSE Religious Education KO - Islam Practices

Keywords	
Tawalla	
Tabarra	
Khums	
Lesser jihad	
Greater jihad	
Sunni	
Shi'a	
Niyyah	
Du'a	

What we are learning in this unit

A. The 5 Pillars and 10 Obligatory Acts
B. Salah
C. Sawm
D. Zakah
E. Hajj
F. Jihad
G. Id-ul-Adha
H. Id-ul-Fitr

A.	*5 Pillars of Islam and 10 obligatory acts*
What are the 5 pillars	
What are the 10 obligatory acts	
Shahadah	

	Jihad
Lesser Jihad	
Greater Jihad	

B.	*The 5 Pillars - Salah*
What is it?	
Wuzu	
Rak'ahs and recitations	
Salah at home	
Salah in the mosque	
Jummah	
Differences between Sunni and Shi'a	

Year 10 GCSE Religious Education KO - Islam Practices

	The 5 Pillars - Zakah
The role of giving alms	• ***Muslims believe it is their duty to ensure Allah's wealth has been distributed equally as everyone is the same*** • The Qur'an commands to give to those in need
The significance of giving alms	• Giving 2.5% of savings/wealth to charity • Wealth can cause greed which is evil, so Zakah purifies wealth – wealth is given by God and must be shared • The Prophet Muhammad practiced Zakah as a practice in Medina • Given to the poor, needy and travellers • ***Sadaqah*** is giving from the heart out of generosity and compassion
Khums	• Shi'a Islam – one of the 10 obligatory acts • 20% of any profit earned by Shi'a Muslims paid as a tax • Split between charities that support Islamic education and anyone who is in need • ***"know that whatever of a thing you acquire, a fifth of it is for Allah, for the Messenger, for the near relative, and the orphans, the needy, and the wayfarer"***

	The 5 Pillars - Hajj
The role of pilgrimage	• A pilgrimage to Makkah which is compulsory for Muslims to take at least once as long as they can afford it and are healthy
The significance of pilgrimage	• God told Ibrahim to take his wife and son on a journey and leave them without food or water • Hajira ran up and down two hills in search of water, could not find any and prayed to God. Then water sprung from the ground. This is the Zamzam well • When Ibrahim returned he was commanded to build the Ka'ba as a shrine dedicated to Allah • Hajj is performed in the month of Dhu'l-Hijja
Actions	• Ihram – dressing in two pieces of white cloth • Circling the Ka'aba 7 times (tawaf) • Drinking water from the Zamzam well like Hajar • walking between Al-Safa and Al-Marwa hills seven times • Throwing stones at 3 pillars (jamarat) to represent casting out the devil and remembering Ibrahim throwing stones at the devil to drive him away • Asking Allah for forgiveness at Mt Arafat • Collecting pebbles at Muzdalifah

	The 5 Pillars - Sawm
The role of fasting	• Fasting during Ramadan (9th month in Muslim calendar) • Muslims give up food, drink, smoking and sexual activity in daylight hours • Pregnant people, children under 12, travellers and elderly people are exempt from fasting.
The significance of fasting	• Ramadan is believed to be the month that Prophet Muhammad began to receive revelations of the Qur'an • Helps Muslims to become spiritually stronger
Reasons for fasting	• Obeying God and exercising self-discipline • Develops empathy for the poor • Appreciation of God's gifts • Giving thanks for the Qur'an • Sharing fellowship and community with other Muslims
Night of power	• The night when the Angel Jibril first appeared to Muhammad and began revealing the Qur'an. • The most important event in history – ***"better than a thousand months" (Surah 97:3)*** • Laylat Al-Qadr is the holiest night of the year. Muslims try to stay awake for the whole night to pray and study for the Qur'an

	Id-ul-Adha, Id-ul-Fitr, Ashura
Id-ul-Adha Not an official holiday in UK	• ***Festival of sacrifice*** • Marks the end of Hajj and is a chance for whole Ummah to celebrate • ***Origins*** – Ibrahim's commitment to God in being willing to sacrifice his son, Ishmael. God was testing Ibrahim • ***Key events*** – new clothes, sacrificing an animal, visiting the Mosque. • People ask a butcher to slaughter a sheep for them and share the meat with the community
Id-ul-Fitr Public holiday in Muslim majority countries, not UK	• ***Festival of fast-breaking*** • Marks the end of Ramadan • ***Key events*** – Decorate homes with colourful light and banners, dress in new clothes, gather in Mosques, give gifts and money, give to the poor • ***Zakah ul-Fitr*** – donation to the poor so that everyone can eat a generous meal at the end of Ramadan.
Ashura	• Sunni celebration – many fast on this day which was established by Prophet Muhammad • Shi'a mourning – Husayn was murdered and beheaded. Muslims remember his death and betrayal • ***Key events*** – public displays of grief, day of sorrow, wear black, re-enactments of martyrdom, not a public holiday in Britain but Muslims may have day off school

Year 10 GCSE Religious Education KO - Islam Practices

	The 5 Pillars - Zakah
The role of giving alms	
The significance of giving alms	
Khums	

	The 5 Pillars - Sawm
The role of fasting	
The significance of fasting	
Reasons for fasting	
Night of power	

	The 5 Pillars - Hajj
The role of pilgrimage	
The significance of pilgrimage	
Actions	

	Id-ul-Adha, Id-ul-Fitr, Ashura
Id-ul-Adha Not an official holiday in UK	
Id-ul-Fitr Public holiday in Muslim majority countries, not UK	
Ashura	

Year 10 Term 5 Knowledge Organiser Spanish

La vida escolar en España (pages 104–105):

¿Cómo es tu instituto?	*What's your high school like?*
el **curso**/día escolar	*school year/day*
el instituto / la escuela *primaria	*secondary school / primary school*
la escuela pública/privada	*state/private school*
los alumnos/estudios	*students/studies*
la formación **profesional** / *el bachillerato	*vocational training / baccalaureate (equivalent to A Levels)*
¿Qué ropa llevas en el insti?	***What clothes do you wear at school?***
Llevo ...	*I wear ...*
ropa deportiva / un jersey	*sports clothes / a jumper*
un pantalón/uniforme	*trousers / a uniform*
una camisa/camiseta	*a shirt/T-shirt*
un vestido / una falda	*a dress/shirt*
una chaqueta/corbata	*a jacket/tie*
unos zapatos	*some shoes*
unas zapatillas de deporte	*some trainers*

¿Cómo son las instalaciones?	*What are the facilities like?*
el edificio / la biblioteca	*building / library*
los campos deportivos	*sports grounds*
el gimnasio	*gym*
*los laboratorios / *las aulas	*laboratories / classrooms*
caro/a(s) / barato/a(s)	*expensive / cheap*
cómodo/a(s) / incómodo/a(s)	*comfortable / uncomfortable*
bonito/a(s) / feo/a(s)	*beautiful, nice / ugly*
divertido/a(s) / excelente(s)	*funny, amusing / excellent*
viejo/a(s) / **decepcionante(s)**	*old / disappointing*
¿Cómo es el director / la directora?	***What is the headteacher like?***
En mi opinión, el director / la directora ...	*In my opinion, the headteacher ...*
es alegre / buenísimo/a	*is happy/cheerful / very good*
tiene buen **sentido** del **humor**	*has a good sense of humour*

These are the words / phrases that will come up in Term 5 as part of your GCSE Spanish learning.

Use look / cover / write / check method to learn these words.

¿Qué tal tus estudios? (pages 108–109):

¿Cuál es tu asignatura favorita?	*What is your favourite subject?*
Mi asignatura favorita es ...	*My favourite subject is ...*
Lo que más/menos me gusta es ...	*What I like the most/least is ...*
Se me da(n) bien/mal ...	*I am good/bad at ...*
el dibujo/teatro	*Art/Drama*
el español/inglés	*Spanish/English*
la geografía/historia	*Geography/History*
la *literatura/música	*Literature/Music*
la religión/educación física	*Religion/PE*
la tecnología/*informática	*Technology/IT*
las ciencias/matemáticas	*Science(s)/Maths*
los idiomas	*languages*
porque / ya que es/son ...	*because it is / they are ...*
aburrido/a(s) / difícil(es)	*boring / difficult*
divertido/a(s) / duro/a(s)	*fun/amusing / hard*
fácil(es) / importante(s)	*easy / important*
imposible(s) / interesante(s)	*impossible / interesting*
útil(es) / **práctico/a(s)**	*useful / practical*
complejo/a(s)	*complex*
pesado/a(s)	*annoying, boring*

Un día en el insti (pages 106–107):

¿Cómo vas al instituto?	*How do you go to school?*
Voy (al insti) ...	*I go (to school) ...*
a pie / en coche/tren	*on foot / by car/train*
en autobús/bici	*by bus/bike*
¿Cómo es tu día escolar?	*What is your school day like?*
Las clases empiezan/terminan a las ...	*Classes start/end at ...*
Cada clase dura una hora.	*Each class lasts an hour.*
Hay un descanso a las ...	*There is a break at ...*
¿Qué sueles hacer a la hora de comer?	*What do you usually do at lunchtime?*
Salgo al patio.	*I go out to the playground.*
Traigo un bocadillo.	*I bring a sandwich.*
Voy a la biblioteca/cantina.	*I go to the library/canteen.*
¿Qué día de la semana prefieres?	*Which day of the week do you prefer?*
Prefiero los martes cuando tengo/tenemos ...	*I prefer Tuesdays when I/we have ...*
actividades *extraescolares.	*extracurricular activities.*
todas mis asignaturas favoritas.	*all my favourite subjects.*
¿Qué haces después del insti?	*What do you do after school?*
Soy miembro de un club.	*I am a member of a club.*
Soy **capitán/capitana** del equipo.	*I am captain of the team.*
Ayudo con la radio escolar.	*I help with the school radio.*
Toco en la orquesta.	*I play in the orchestra.*
¿Cuánto tiempo llevas ...?	*How long have you been ...?*
Llevo/Llevamos dos años ...	*I/We have been ... for two years.*
participando en el proyecto	*participating in the project*
asistiendo a clases de baile	*attending dance classes*
jugando al voleibol	*playing volleyball*
¿Por qué te gusta esta actividad?	*Why do you like this activity?*
Me encanta porque ...	*I love it because it...*
te ayuda a ...	*helps you to ...*
te da **la oportunidad** de ...	*gives you the opportunity to ...*
te anima a ... / **te permite** ...	*encourages/allows you to ...*
aprender cosas nuevas	*learn new things*
desarrollar tus talentos	*develop your talents*
hacer nuevos amigos	*make new friends*
ser *creativo/a	*be creative*
te da ...	*gives you ...*
más confianza	*more confidence*
un **sentimiento** de éxito	*a sense of accomplishment*
te hace **sentir orgulloso/a**	*makes you feel proud*
¿Qué hiciste recientemente con el club/equipo?	*What did you do recently with the club/team?*
Organizamos una competición ...	*We organised a competition ...*
Hicimos un espectáculo de ...	*We did a ... show*
Acabo de ...	*I have just ...*

Me cuesta (mucho) ...	*I find it very difficult to ...*
Es difícil ...	*It is difficult ...*
recordar todas las fechas	*to remember all the dates*
resolver los problemas	*to resolve problems*
¿Qué vas a hacer para tener éxito?	*What are you going to do to be successful?*
Para aprobar mis exámenes, ...	*To pass my exams, ...*
Para mejorar mi **nivel**, ...	*To improve my level, ...*
Para sacar buenas/mejores notas, ...	*To get good/better marks, ...*
Para tener éxito en la **prueba**, ...	*To be successful in the test, ...*
aprenderé de mis errores	*I will learn from my mistakes*
participaré más en clase	*I will participate more in class*
preguntaré al profesor si no entiendo	*I will ask the teacher if I don't understand*
pasaré más tiempo *repasando	*I will spend more time revising*
asistiré a clases de *repaso	*I will attend revision classes*

¿Cómo cambiarías tu instituto? (pages 110–111):

¿Qué harías para mejorar tu instituto?	*What would you do to improve your school?*
Mejoraría la calidad de la comida.	*I would improve the quality of the food.*
Reduciría el precio del uniforme.	*I would reduce the price of the uniform.*
Permitiría el uso de los móviles en clase.	*I would allow the use of mobiles in class.*
Construiría un nuevo **gimnasio**.	*I would build a new gym.*
Ofrecería más actividades *extraescolares.	*I would offer more extracurricular activities.*
¿Qué es lo malo de tu instituto?	*What is the bad thing about your school?*
Lo malo de mi instituto es **que** ...	*The bad thing about my school is that ...*
las instalaciones deportivas son viejas / están en mal **estado**	*the sports facilities are old / are in a bad state*
las reglas son demasiado estrictas	*the rules are too strict*
los teléfonos están prohibidos	*telephones are prohibited*
tenemos que **gastar** dinero en ...	*we have to spend money on ...*
muchos alumnos ...	*many students ...*
tienen miedo / **sufren** *amenazas.	*are scared / suffer threats.*
Hay que ...	*You have to ...*
llegar a tiempo	*arrive on time*
respetar a los alumnos/ profesores	*respect students/teachers*
mantener limpio el patio	*keep the playground clean*
quedarse sentado durante la clase	*stay seated during class*
No **se** debe ...	*You must (not) ...*
No **se permite** / Está prohibido ...	*You are (not) allowed to ...*
traer aparatos **electrónicos** personales	*bring personal electronic devices*
tirar **basura** al suelo	*throw rubbish on the floor*
comer/beber en *las aulas	*eat/drink in classrooms*
ir al servicio sin *el permiso del profesor	*go to the toilet without the teacher's permission*
(No) Estoy de acuerdo con esta norma porque ...	*I (don't) agree with this rule because ...*

La gente de mi insti (pages 112–113):

¿Qué tipo de alumno eres?	*What type of student are you?*
Soy muy/bastante/demasiado ...	*I am very/quite/too ...*
responsable / trabajador(a)	*responsible / hard-working*
independiente / *perezoso/a	*independent / lazy*
Tengo ganas de tener éxito.	*I am keen to be successful.*
(No) Quiero / (No) Me gusta ...	*I (don't) want / I (don't) like ...*
aprender / aprobar	*to learn / to pass*
estudiar / *repasar	*to study / to revise*
¿Cómo te preparas para el día escolar?	***How do you prepare for a school day?***
(No/Nunca) Llego temprano / a tiempo.	*I (don't/never) arrive early / on time.*
¿Dónde sueles hacer los deberes?	***Where do you usually do your homework?***
Los hago en casa o en la biblioteca.	*I do it at home or in the library.*
No los hago **jamás**.	*I never do it.*

¿Aprendes mucho en clase?	*Do you learn a lot in class?*
(No) Escucho al profe / a nadie.	*I (don't) listen to the teacher / to anyone.*
(No) Hago todas **las tareas**.	*I (don't) do all the homework.*
Suelo ...	*I usually ...*
sacar buenas notas	*get good marks*
recordar lo que necesito	*remember what I need*
¿Cómo sería tu profesor(a) *ideal?	***What would your ideal teacher be like?***
Mi profesor(a) *ideal ...	*My ideal teacher ...*
haría mucho esfuerzo para ...	*would make a lot of effort to ...*
no **gritaría** nada	*wouldn't shout at all*
no **nos** pondría demasiados deberes	*wouldn't give us too much homework*
no sería demasiado estricto/a	*wouldn't be too strict*
nos dejaría usar el móvil	*would let up use our mobile*
nunca llegaría tarde a clase	*would never arrive late to class*
tendría un buen **sentido** del **humor**	*would have a good sense of humour*
sería *comprensivo/a	*would be understanding*

El viaje de fin de curso (pages 114–115):

¿Cómo fue el viaje?	*How was the trip?*
(des)afortunadamente	*(un)fortunately*
especialmente / generalmente	*especially / generally*
inmediatamente / rápidamente	*immediately / quickly*
recientemente / **actualmente**	*recently / currently*
seguramente / **verdaderamente**	*surely / truly*
Hicimos un **viaje** de fin de **curso**.	*We went on an end-of-year trip.*
El primer/segundo/tercer día ...	*The first/second/third day ...*

¿Visitaste algún lugar de interés?	*Did you visit any place of interest?*
Visitamos el parque nacional ...	*We visited the ... national park.*
Fuimos al parque temático ...	*We went to the ... theme park.*
¿Qué otras actividades hiciste?	***What other activities did you do?***
Cada día hicimos actividades distintas.	*We did different activities each day.*
Asistimos a una clase de cocina.	*We attended a cookery class.*

Hardware and Software

Hardware:

The physical, electrical/mechanical parts of a computer. This consists of internal components such as the CPU and graphics card, and additional hardware which allows the users to communicate with the system through input and output devices, such as a monitor and a keyboard.

Externally attached hardware are known as peripherals.

Software:

The programs, data and applications in a computer system. Any parts of a computer system that aren't physical.

Software can be classified as either application or system software.
Application – Programs which perform specific end-user tasks. E.g. web browser, spreadsheet, games.
System – Programs which help to run or maintain the computer system.

System Software:

Operating Systems -
Manages processes.
Manages memory.
Manages I/O (input/output) devices.
Manages applications.
Manages security (access levels, user accounts)
Controls hardware components.
Provides a platform for software to run on.
Provides a user interface.

Utility Programs -
Programs which help to maintain or manage the computer system. E.g. Disk Defragmenters, Antivirus, Compression, Encryption, Registry Cleaners, Driver Updaters,

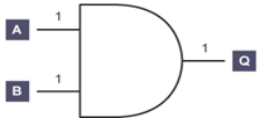
Translators -
Translate source code from a high-level language or assembly code into machine code (binary). There are three types, Compilers, Interpreters and Assemblers.

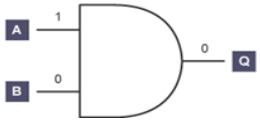
Compilers – Does the translation all at once and creates an exe file containing the machine code.

Interpreters – Does the translation line by line.
Inverts the input.
Assembler – Converts assembly code.

Boolean Logic Gates

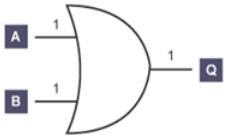
AND Gate.
Both inputs need to be true for the output to be true.

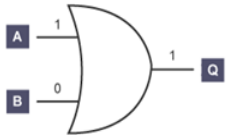




Input A	Input B	Output Q
0	0	0
0	1	0
1	0	0
1	1	1

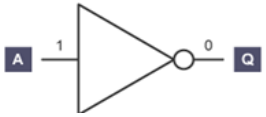
OR Gate.
Either of the two inputs needs to be true for the output to be true.

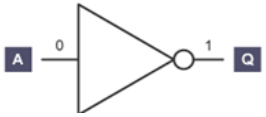




Input A	Input B	Output Q
0	0	0
0	1	1
1	0	1
1	1	1

NOT Gate.





Input A	Output Q
1	0
0	1

Y10 COMPUTER SCIENCE – TERM 5 & 6 COMPUTER SYSTEMS

CPU Components

Control Unit (CU) – fetches, decodes and executes instructions. Sends control signals to the system and peripherals. Moves data around the system.

Arithmetic Logic Unit (ALU) – performs arithmetic and logical operations. Acts as a gateway between primary memory and secondary storage.

Cache – Small amount of high speed memory to store frequently used data and instructions.

Clock – Synchronises all computer's components by sending out regular electrical pulses. The more pulses per second, the more calculations and operations can be performed. This is measured in Hz.

Buses – Collections of parallel wires for high speed internal communication within the CPU.

Address Bus – Carries memory addresses.
Data Bus – Carries data between components.
Control Bus – Carries control signals.

Registers – Small amounts of high speed memory within the CPU. Special purpose ones listed below.

Program Counter – Holds the memory address of the next instruction.
Memory Address Register – Holds the address of the current instruction.
Memory Buffer/Data Register – Holds the data that is either being retrieved or stored.
Current Instruction Register – Holds the current instruction which needs to be decoded and executed.
Accumulator – Holds the result of calculations from the ALU.

Fetch-Decode-Execute Cycle

1. The memory address held in the program counter is copied into the MAR.
2. The address in the program counter is then incremented (increased by 1) so it now holds the address of the next instruction to be fetched.
3. The processor sends a signal along the address bus to the memory address held in the MAR.
4. The instruction/data in that memory address is carried by the data bus to the MBR/MDR.

5. The instruction/data in the MBR/MDR is copied to the CIR.
6. The instruction/data in the CIR is decoded and executed. Results of processing are stored in the ACC.
7. The cycle then returns to step one.

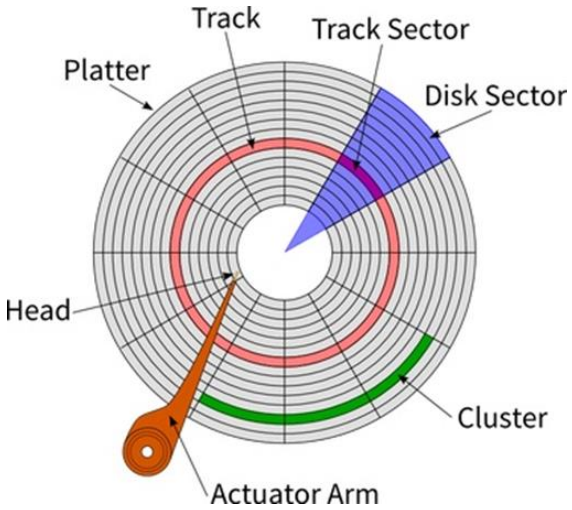
Secondary Storage

Secondary Storage is long-term, non-volatile storage. Without secondary storage, all programs and data would be lost when the computer is turned off.

Magnetic

Hard disks spin.

Actuator arm moves a read/write head over the disk to access parts of it. The head can detect the magnetisation of the disk and either magnetise (1's) or demagnetise (0's) parts of it.



Optical

Optical disk spins and has a spiral track.
Laser head is moved over the disk and shines the laser down onto it.
Disk has pits (scatters light 0's) and lands (reflects light 1's).
Writeable disks have photosensitive dye which is burned to represent 1's and 0's.

Solid State

A collection of semiconductor chips which can be accessed and written to extremely quickly.
No moving parts, so they are more reliable than disks.

27. A private limited company (Limited Liability)

When a business fails, a company that has limited liability restricts the losses suffered by the business owners (shareholders) to the sum of money that they invested in the business.

Benefits of Limited companies.

A company can have share capital, which makes it easier to divide up the ownership between different investors.

If the business needs to raise more capital, it is quite easy to issue more shares for sale to other investors

The business continues to exist even if the founder dies. The company develops a life of its own

Due to limited liability, the owners/shareholders can be bold about investing in the future of the business. If a bold move goes wrong, the business may suffer but individual shareholders are not liable for debts

28. Sole Trader (Unlimited Liability)

Treating the business and the individual owner as the same entity, therefore making the business owner responsible for all the debts in a business.

Why ignore Limited Liability?

The only logical reason for ignoring limited liability is if there is no realistic possibility of debts building up. For example, if the business is a market stall, where goods are bought for cash. In this scenario debts would be hard to build up and firms will be reluctant to pay the related costs and fill out the required paperwork.

29. Key Words: Making your business effective

Term	Definition
Bankrupt	When an individual is unable to pay their debts, even after all personal assets have been sold for cash
Private Limited Company	A small family business in which shareholders enjoyed limited liability
Sole Trader	A business run by one person; that person has unlimited liability for any business debts.

30. Franchising

Paying a franchise owner for the right to use an established business name, branding and business methods

Why do Businesses expand by selling franchises?

A firm can expand its sales quickly; this helps fill gaps that other businesses will fill if they don't

Franchise owners not only sell a franchise but will receive a share of all future sales. Subway receives 8% of the sales revenue of all 45,000 stores.

The Franchise owner can concentrate on developing new products and services, and on high quality advertising.

31. What are the benefits of Franchising for a entrepreneur?

When you franchise you buy the companies images, products and methods. Starting a business requires a wide range of skills, by franchising you are giving your business a stronger starting point.

An individual outlet/business could never afford image building TV advertising, franchising enables business to benefit from major marketing campaigns.

32. What are Royalties?

The percentage of sales revenue to be paid to the overall franchise owners

33. Business Locations

Location is key to the success of any business

Factors influencing business location:

Proximity to Market: For many businesses this is the most important factor. For a physical service such as a shop, restaurant or hotel, customer convenience will be critical revenue. **Shops must be located in areas of high footfall.**

Proximity to Materials: For manufacturing businesses, nearness to materials may be more important than nearness to customers. **Being close to materials can cut costs for firms in manufacturing.**

Proximity to Labour: Labour is key to any business; therefore businesses must be located in areas where the labour force is equipped with the necessary skills to allow the business to thrive.

Proximity to Competitors: Many businesses want at location far away from competitors – effectively being the only supplier to customers in a local area However, some businesses will want to be closer to their competitors as location is key to their business. For example; location is key for restaurants and more important than proximity to competitors.

34. How has the internet impacted business location:

Due to the impact of e-commerce, business location matters less. Firms can locate their head office anywhere they choose **provided the local labour force are equipped with the skills to run the administration effectively.**
Internet based firms will have a more extensive stock range in all sizes and **can cater more extensively for consumers needs than retail outlets.**

35. Business Location: Key terms:

Fixed Premises:

Real life buildings such as shops, offices and warehouses.

Proximity:

Nearness: Whether or not a business wants to be closer to a factor such as its customers.

36. Marketing Mix

The four factors that make up the marketing mix, usually referred to as the marketing mix. Usually referred to as the four ps.

Product	Targeting customers with a product that has the right blend of functional aesthetic benefits without being too expensive to produce
Price	Setting the price that retailers must pay which in turn affects the consumers price
Promotion	Includes all the methods that a business uses to persuade customers to buy, for example branding, packaging, advertising to boost long term image of the product and short-term offers
Place	How and where the supplier is going to get the product or service to the consumer; it includes selling products to retailers and getting the products displayed in prominent positions.

37. What is a business plan?

A detailed document setting out the marketing and financial thinking behind a proposed new business.

38. What should a good business plan contain?

1. **The business idea;** Why, who & how?
2. **Business Aims & Objectives;** What is business setting out to do?
3. **Target Market;** Who will you be your target consumer?
4. **Marketing Plan;** How will you market your product to consumers?
5. **Forecast revenue, costs and profits;** Working out the break-even point
6. **Cash Flow Forecast;** Cash is key to any business
7. **Sources of Finance;** How will the business fund itself?
8. **Location;** Where should the business be based?
9. **Marketing Mix:** How will the company market their product?

39. Stakeholder

Stakeholders are the people or groups with an interest in the success or failure of an organisation.

Types of stakeholders & their typical objectives:

Business owners & shareholders
Interested in the business being successful and making a profit.

Staff/managers
Interested in having job security, career development, fair wages etc.

Customers
Interested in getting an honest and fair deal from a business.

Local Community
Interested in honest and fair dealing/co-operation with the organisation with regards to local employment and environment.

Local Government
Interested in employment plans, location plans and business ability to pay tax.

Pressure Groups
Interested in fair and ethically correct business practices.

40. Types of technology used in business

Technology is used in different aspects of business:

E-commerce: Allows businesses to sell their products online and reach a wider audience of potential customers with lower costs.

Social Media: Allows a business to communicate and interact directly with customers.

Digital Communication: E-mail allows customers to contact a business personally and directly.

Payment Systems: Online payment systems (eg. Paypal) allow all types of businesses to access their payments fast and easily.

41. How does technology influence business activity?

Sales can increase as a result of e-commerce because customers can access products or services 24 hours a day, 7 days a week. New technology drives innovation to create new products or services and this can increase sales of new products.

Costs can be reduced through advertising online through websites, e-mail newsletters, and via social media. Costs can also be reduced through manufacturing efficiency and being able to find the best deal on raw materials online.

The 4 P's are affected by different types of technology.
Product = New technologically advanced product or a new method of production.
Promotion = Digital marketing can improve the effectiveness of marketing and is cheap.
Place = Products can be sold online and can be accessed by customers worldwide.

42. Retail Legislation	
Legislation	Law's passed by acts of parliament. Too many rules that impact on a business from operating as the owner would like are known as "**Red Tape**".
Consumer Rights Act 2015	• Goods must be fit for purpose and free from defects. • The buyer has the right to get their money back or have their product repaired at the seller's expense. • Any issues are to be dealt with by the seller and not the manufacturer.
Trade Descriptions Act	• Trader's can not use false or misleading statements. • Labels must not be misleading.
Other acts of legislation:	Consumer credit act 1974, The weights and measures act 1985, The food safety act 1990.

43. Recruitment Legislation	
Employees are protected from being exploited in the work place.	
Equality Act 2010	Organisations must consider all job applicants equally in regards to gender, age, skin colour etc.
Equal Pay Act 1970	Organisations must pay workers fairly and can not discriminate in regards to gender, age or skin colour etc.

44. The Economy	
The economy is the collection of business transactions that take place throughout the country, throughout the year.	
Interest rates.	The amount that a lender charges per year to someone who has borrowed money. This is measured as a percentage.
Exchange rates	The value of the pound (£) measured by how much foreign currency can be bought per pound (£).
Recession	A downturn in sales and output throughout the economy, often leading to rising unemployment.
Inflation	The rate in which prices are rising from the same time last year.

45. Changes in interest rates

Interest rates change depending on how confident a lender is on the state of the economy. If the economy is strong the % rates are low, if the economy is weak then % rates are high.

Effects of lower interest rates:

Increased customer spending:
Customers are happy to spend money more confidently because they will pay less in interest and are more likely to have an excess in disposable income.

More favourable borrowing:
Businesses can borrow money from lenders at a lower rate of interest.

Effects of higher interest rates:

Reduced customer spending:
Customers are unlikely to spend money confidently because they will pay more in interest on loans and mortgages. Customers are more likely to have a lack of disposable income.

Less favourable borrowing:
Businesses will be charged higher interest rates on any money they have borrowed.

46. Changes in exchange rates

Exchange rates change depend on the supply and demand for different currencies. This is based on how well a country's economy is performing.

Effects of a strong pound (£):

Imported goods become cheaper to buy, Products being exported become more expensive abroad.

Effects of a weak pound (£):

Imported goods become more expensive to buy, products being exported become cheaper abroad.

47. External Influences

External influences can impact a business significantly. Business owners are often powerless to control how and when these influences can impact on business.

Typical external influences

- **Technology –** Technology changes all the time and it can affect how customers buy from a business, how products are made or even how a business is expected to communicate with customers.
- **Legislation –** New laws are created by government to protect consumers, employees and business activities from unethical, unsafe or undesirable working practices. Some legislation can be perceived as being a barrier to easy business and is known as "Red Tape".
- **Economic Climate –** Businesses need to be able to react to changes in the economy. If customers are feeling unconfident in their ability to spend money because of a weak economy, then this could affect a business's ability to generate sales. If exchange rates change, a business will need to deal with the consequences of higher costs or lower demand abroad.

Food spoilage, contamination and food poisoning

Food spoilage
As soon as food is harvested, slaughtered or processed it starts to change. This happens for two main reasons:
•autolysis – self destruction, caused by enzymes present in the food;
•microbial spoilage – caused by the growth of micro-organisms, i.e. bacteria, yeasts and moulds.

Food spoilage: Autolysis – enzymes
Enzymes are chemicals which can cause food to deteriorate in three main ways:
•ripening – this will continue until the food becomes inedible, e.g. banana ripening;
•browning – enzymes can react with air causing certain foods, e.g. apples, to discolour;
•oxidation – loss of nutrients, such as vitamin C from food, e.g. over boiling of green vegetables.

Food spoilage: Microbial spoilage
Spoilage can be caused by the growth of:
•bacteria – single celled micro- organisms which are present naturally in the environment;
•yeasts – single celled fungi;
•moulds – fungi which grow as filaments in food.

Food contamination
Food contamination can lead to food poisoning. There are three ways which food can be contaminated: **bacterial**, **chemical** and **physica**l.

Chemical contamination
Chemical contamination can occur in a variety of ways at different stages of food processing and production. For example, chemicals from the farm; cleaning products used in the processing plant and fly spray used in the kitchen.

Physical contamination
This can occur in a variety of ways at different stages of food processing and production. Some examples are:
•soil from the ground when harvesting;
•a loose bolt from a processing plant when packaging;
•a hair from a chef in the kitchen.

Bacterial contamination
Most bacteria are harmless but a small number can cause illness. These are known as pathogenic bacteria. Food which is contaminated with pathogenic bacteria can look, taste and smell normal.
Bacteria can be transferred onto food through cross-contamination, via equipment, people or pests, or can be naturally present in the food.
Some bacteria can produce toxins which can cause food poisoning.

Micro-organisms
Micro-organisms need conditions to survive and reproduce these can include:
•temperature;
•moisture;
•food;
•time;
•oxygen and pH level.

Temperature
Bacteria need warm conditions to grown and multiply.
•The ideal temperature for bacterial growth is 30ºC – 37ºC.
•Some bacteria can still grow at 10ºC and 60ºC.
•Most bacteria are destroyed at temperatures above 63 ºC.
•Bacterial growth danger zone is 5ºC - 63ºC.
At very cold temperatures, bacteria become dormant – they do not die, but they cannot grow or multiply.

Moisture
Where there is no moisture bacteria cannot grow. However, bacteria and moulds can both produce spores which can survive until water is added to the food.

Food
Bacteria need a source of food to grow and multiply, these food are usually high in moisture, fat and protein, and may be ready to eat. Food where bacteria rapidly multiple in is called a **high risk food**. For example:
•meat, meat products and poultry;
•milk and dairy products;
•eggs – uncooked and lightly cooked;
•shellfish and seafood;
•prepared salads and vegetables;
•cooked rice and pasta.

Time
Given the right conditions, one bacterium can divide into two every 10-20 minutes through a process called binary fission.

People at high risk of food poisoning
Elderly people, babies and anyone who is ill or pregnant needs to be extra careful about the food they eat.

Symptoms of food poisoning
Food poisoning can be mild or severe. The most common symptoms are:
•feeling sick;
•being sick;
•diarrhoea;
•abdominal pain.

Campylobacter
Sources
Raw and undercooked poultry, unpasteurized milk, contaminated water.
Signs and symptoms
Onset 2 – 5 days (can be longer). Fever, headache and dizziness for a few hours, followed by abdominal pain.

E Coli 0157
Sources
Raw and undercooked meat and poultry. Unwashed vegetables. Contaminated water.
Signs and symptoms
Onset usually 3-4 days. Diarrhoea, which may contain blood, can lead to kidney failure or death.

Listeria
Sources
Unpasteurised milk and dairy products, cook-chill foods, pate, meat, poultry and salad vegetables.
Signs and symptoms
Onset 1-70 days. Ranges from mild, flu-like illness to meningitis, septicaemia, pneumonia.
During pregnancy may lead to miscarriage or birth of an infected baby.

Salmonella
Sources
Raw meat, poultry and eggs. Flies, people, sewage and contaminated water.
Signs and symptoms
Onset 6-48 hours. Headache, general aching of limbs, abdominal pain and diarrhoea, vomiting and fever. This usually lasts 1 – 7 days, and rarely is fatal.

Staphylococcus aureus
Sources
Humans: nose, mouth and skin. Untreated milk.
Signs and symptoms
Onset 1 – 6 hours. Severe vomiting, abdominal pain, weakness and lower than normal temperature.
This usually lasts 6 – 24 hours.

Key terms
Bacteria: Small living organisms that can reproduce to form colonies. Some bacteria can be harmful (pathogenic) and others are necessary for food production, e.g. to make cheese and yogurt.
Binary fission: The process that bacteria uses to divide and multiply.
Cross-contamination: The transfer of bacteria from one source to another. Usually raw food to ready to eat food but can also be the transfer of bacteria from unclean hands, equipment, cloths or pests. Can also relate to allergens.
Food spoilage: The action of enzymes or microorganisms which make the food unacceptable to consume.
Food poisoning: Illness resulting from eating food which contains food poisoning micro-organisms or toxins produced by micro-organisms.
Toxin: A poison produced by some bacteria which can cause food poisoning.

Allergens
Allergenic ingredients can cause adverse reactions in some people. Care must be taken at each stage of food processing to prevent contamination.

Desirable food changes
Desirable changes that can be caused by micro-organisms include:
•bacteria in yogurt and cheese production;
•mould in some cheeses, e.g. Stilton;
•yeast in bread production.

Food spoilage, contamination and food poisoning

Food spoilage
As soon as food is harvested, slaughtered or processed it starts to change. This happens for two main reasons:
•autolysis –

•microbial spoilage –

Food spoilage: Autolysis – enzymes
Enzymes are chemicals which can cause food to deteriorate in three main ways:
•ripening

•browning

•oxidation

Food spoilage: Microbial spoilage
Spoilage can be caused by the growth of:
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•yeasts
•moulds

Food contamination
Food contamination can lead to_____There are three ways which food can be contaminated:

Chemical contamination
Chemical contamination can occur in a variety of ways at different stages of food processing and production. For example:

Physical contamination
This can occur in a variety of ways at different stages of food processing and production. Some examples are:
-

-

Bacterial contamination
Most bacteria are harmless but a small number can cause illness. These are known as pathogenic bacteria. Food which is contaminated with pathogenic bacteria can look, taste and smell normal.
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Micro-organisms need conditions to survive and reproduce these can include:
-
-
-
-
-

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Bacteria need warm conditions to grown and multiply.
•The ideal temperature for bacterial growth is _____Some bacteria can still grow at 10ºC and 60ºC.
•Most bacteria are destroyed at temperatures above _____
•Bacterial growth danger zone is_____
•At very cold temperatures, bacteria become_____– they do not die, but they cannot grow or multiply.

Food
Bacteria need a source of food to grow and multiply, these food are usually high in moisture, fat and protein, and may be ready to eat. Food where bacteria rapidly multiple in is called a **high risk food**. For example:
-
-
-
-
-
-

Time
Given the right conditions, one bacterium can divide into two every 10-20 minutes through a process called_____.

People at high risk of food poisoning

Symptoms of food poisoning
Food poisoning can be mild or severe. The most common symptoms are:
-
-
-
-

Campylobacter
Sources

Signs and symptoms

Moisture
Where there is no moisture bacteria cannot grow. However, bacteria and moulds can both produce spores which can survive until water is added to the food.

E Coli 0157
Sources

Signs and symptoms

Listeria
Sources

Signs and symptoms

Salmonella
Sources

Signs and symptoms

Staphylococcus aureus
Sources

Signs and symptoms

Key terms
Bacteria:

Binary fission:

Cross-contamination:

Food spoilage:

Food poisoning:

Toxin:

Allergens
Allergenic ingredients can cause adverse reactions in some people. Care must be taken at each stage of food processing to prevent contamination.

Desirable food changes
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-

-

-

Year 10 PRODUCT DESIGN Term 5

What we are learning this term:

A. Modern Materials
B. Smart Materials
C. Polymers
D. Composite Materials
E. Technical Textiles
F. Textiles

A. Modern Materials

A modern material is a material that has been engineered to have improved properties.

Type	Properties	Common Uses
Graphene	Transparent. Very strong and light	Protective equipment and clothing
Metal Foams	Lightweight. Strong under compression. Absorbs energy well.	Prosthetics. Soundproofing and crash protection.
Titanium	High strength-to-weight ratio. Corrosion resistant.	Prosthetics. Aircraft and spacecraft.

B. Smart Materials

Materials that exhibit a physical change in response to some external stimuli and change back once that stimuli has been removed.

Shape-memory alloys (SMA) – spectacle frames	Thermochromic pigments – colour changing spoons
Photochromic pigments - colour changing lenses and windows	Self-healing materials – metals that resist corrosion, concrete that can heal cracks
Ferrofluids formed by magnetic field – hydraulic suspension pistons	Polymorph –modelling and ergonomic handles

C. Polymers – come from crude oil

Thermoforming can be heated and formed repeatedly, thermosetting can only be formed once

Thermoforming (pliable, recyclable)	Thermosetting (good insulators)
Acrylic (PMMA)	Epoxy resin (ER)
High impact polystyrene (HIPS)	Melamine formaldehyde (MF)
High density polythene (HDPE)	Phenol formaldehyde (PF)
Polypropylene (PP)	Polyester resin (PR)
Polyvinyl chloride (PVC)	Urea formaldehyde (UF)
Polyethylene terephthalate (PET)	These are resistant to heat and chemicals

D. Composite Materials

A composite material is a mixture of two or more materials to enhance properties.

Fibre-based	Materials	Common Uses
Glass-reinforced plastic (GRP)	Glass fibres and resin	Boats, instrument cases
Carbon-reinforced plastic (CRP)	Carbon fibres and resin	Formula 1 car bodies, crash helmets, sports equipment
Glass-reinforced concrete (GRC)	Glass fibres and concrete	Street furniture, urban features.
Particle-based	**Materials**	**Common Uses**
Concrete	Cement, sand and aggregate	Buildings, street furniture
Cement	Ceramic and metal	Electronic components

Sheet-based composite materials – look back to Term 4 – Manufactured Boards

Medium Density Fibreboard (MDF)	Plywood	Chipboard

E. Technical Textiles

Modern textiles can be engineered to have numerous properties.

Conductive Fabrics – touch screen gloves	Fire-retardant fabrics – furniture, furnishings, firefighter clothing.	
Kevlar – racing tyres and bullet proof vests	Microfibres – winter clothes and cleaning cloths	Microencapsulation – sports clothing and scratch and sniff perfume samples

F. Textiles

Textile materials can be found natural or can be formed synthetically

Natural – come from plants or animals	Synthetic – come from coal or oil
Cotton (plant)	Polyester
Wool (animal)	Polyamide (nylon)
Silk (animal)	Elastane

Blended – a mixture of fibres that combines and improves properties

Polycotton	Kevlar	Sympatex

Year 10 PRODUCT DESIGN Term 5

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Titanium		

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	These are resistant to heat and chemicals

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A composite material is a mixture of two or more materials to enhance properties.

Fibre-based	Materials	Common Uses

Particle-based	Materials	Common Uses

Sheet-based composite materials – look back to Term 4 – Manufactured Boards

E. Technical Textiles

Modern textiles can be engineered to have numerous properties.

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Textile materials can be found natural or can be formed synthetically

Natural – come from plants or animals	Synthetic – come from coal or oil

Blended – a mixture of fibres that combines and improves properties

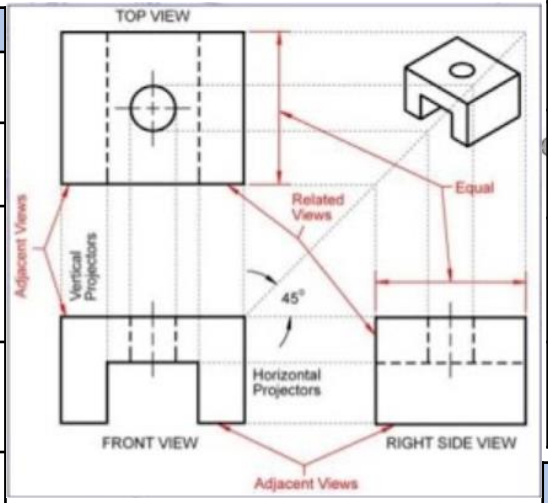
Year 10 Engineering Term 5 (Unit 2)

What we are learning this term:

A. Types of hazard B. Isometric and orthographic C. material properties D. Tools and equipment E. Categories of materials

A. Types of hazard

Sharp force	Anything that has the potential to cut, scratch or slice.
Blunt Force	Anything that has the potential to crush or bruise.
Entrapment	Any moving parts that have the potential to pull you in to the machinery. This leads to crushing / pulling.
Ejection	Any process that has the potential to have material/objects thrown out at you. For example, splinters of wood.
Inhalation	Any process that releases chemicals or particles that are dangerous if breathed in.
Control measure	What is done to reduce the risk of a hazard happening.



B. Orthographic and isometric

To translate isometric to orthographic, you need to always **draw your guidelines** and your **45° guide line.**

C. Material properties

Strength	Ability of a material to withstand compression, tension, torsion, bending, and shear.
Hardness	Ability to withstand abrasion and wear and tear.
Toughness	Materials that can withstand impact or are hard to break or snap are tough & can absorb shock.
Malleability	Being able to bend or shape easily would make a material easily malleable
Ductility	Materials that can be stretched along their length are ductile
Elasticity	Ability to be stretched and then return to its original shape

D. Tools & Equipment

	Taps and dies. Used to cut internal and external threads (spirals) into materials. Place on material and twist foraward two turns and back one turn to cut.
	Lathe knurling tool, used to add surface texture to turned objects on the lathe.
	Chuck key, used to loosen or tighten the chucks (gripping parts) of various machinery.
	The centre punch is made from mild steel, with the point hardened and tempered, so that it withstands impact with the material it is marking. It is normally used to mark the centre of a hole to be drilled
	A Vernier caliper. Can take internal, external and depth measurements.

E. Material categories

Polymers (Plastics)	**Thermoforming –** melt when reheated **Thermoset –** burn when reheated
Metals	**Ferrous –** contain iron, rust and can be magnetic **Non-ferrous –** corrode instead of rusting, no iron
Timbers (wood)	**Hardwoods –** from trees that drop leaves in winter, slow growing and expensive **Softwoods –** from trees that keep their leaves in winter, fast growing and soft
Composites (combined materials)	**Sheet-based –** sheets of material glued together plywood, chipboard. Cheap and easy to manufacture with. **Fibre-based –** glass reinforced plastic, carbon fibre. Very strong and light
Smart materials	Materials that change their properties when given a stimulus. **Thermochromic –** changes colour in heat **Photochromic –** changes colour in light **Shape memory alloy –** can return to its original shape when heated

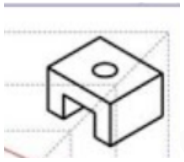
Year 10 Engineering Term 5 (Unit 2)

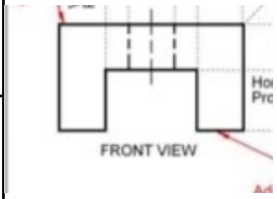
What we are learning this term:

A. Types of hazard B. Isometric and orthographic C. material properties D. Tools and equipment E. Categories of materials

A. Types of hazard

Sharp force	
Blunt Force	
Entrapment	
Ejection	
Inhalation	
Control measure	





B. Complete the Orthographic drawing

C. Material properties

Strength	Ability of a material to withstand...
Hardness	Ability to withstand...
Toughness	Materials that can _____or are _____are tough & can absorb shock.
Malleability	Being able to _____ would make a material easily malleable
Ductility	Materials that can be _____are ductile
Elasticity	Ability to be...

D. Tools & Equipment

E. Material categories

Polymers (Plastics)	**–** melt when reheated **–** burn when reheated
Metals	**–** contain iron, rust and can be magnetic **Non-**_____ **-**
Timbers (wood)	**Hardwoods –** from… **Softwoods –** from …
Composites (combined materials)	**Sheet-based –** one benefit is... **Fibre-based –** for example....
Smart materials	Materials that change their properties when given a _____. _____**chromic –** changes colour in heat ----------**chromic –** changes colour in light **S M A –** can return to its original shape when heated

Year 10 BTEC Health and Social Care- Component 2: Health and Social Care Services and Values.

What we are learning:

A. Key words
B. What are the different types of health care services?
C. What are the different types of social care services?
D. What barriers are there to accessing care services?

A.	Key words for this Unit
Primary care	First point of contact when seeking health care
NHS	National Health Service – Tax funded health care in the UK.
Secondary care	Specialist health treatment and/or care
Tertiary care	Advanced specialist health treatment and/or care.
Allied health professionals	Professionals who are involved in patient care from diagnosis to recover
Clinical support staff	Support allied health professionals with the treatment and care of patients.
Foster care	A stable family home where care is provided on either a short or long-term basis.
Residential care	Accommodation and care for a number of children, young people or adults living together in one building.
Respite care	Short-term care which provides relief for family member who are carers.
Domiciliary care	Care received in the person's own home.
Sensory impairment	Difficulties with senses, most commonly vision and hearing.
Braille	Raised lettering to help visually impaired.
Occupational therapist	Offers support to develop independence for daily living activities.

B	What are the different types of health care services?
Primary Care	• Primary care is the first point of contact a patient is likely to have with the NHS – you can refer yourself to primary care providers. • Primary care providers include pharmacists, Registered GPs/doctors, walk-in centres, accident and emergency departments (A&E), dentists and Opticians.
Secondary Care	• Secondary care is specialist treatment or care. A primary care provider will refer a patient for secondary care if they feel it is necessary for the patient to receive further advice, tests or treatment. • Secondary care providers include cardiologists (heart), gynaecologists (female reproduction), paediatrics (children), obstetrics (childbirth and midwifery), psychiatry (mental health) and dermatology (skin).
Tertiary Care	• Tertiary Care is advanced specialist treatment or care. A secondary care provider will refer a patient for tertiary care for long-term treatment and/or care. • Tertiary care areas include spinal, cardiac (heart), cancer care, chronic pain, burns and neonatal (premature and ill new born babies).
Allied Health Professionals	• Allied health professionals work in a range of specialities They support patients through all stages of care – from diagnosis to recovery. To work with the public they must register with the Health and Care Professions Council (HCPC). • Allied health professionals include art therapists, dieticians, paramedics, physiotherapists, speech and language therapists and radiographers.
Clinical Support Staff	• Clinical support staff work within a range of departments under the guidance of allied health professionals. They are trained in their roles but are not required to register with the HCPC. • Clinical support staff include theatre support workers, prosthetic technicians, dietetic assistant, phlebotomist (collects blood samples), hearing aid dispensers and maternity support workers.

C.	What are the different types of social care services?
Children and young people	• Children and young people may need support on a temporary or permanent basis because their parent of carer is ill; they have family problems, they have behavioural issues or additional needs. • Types of support for children and young people include foster care, residential care and youth work.
Children or adults with specific needs	• Children and adults may need support with specific needs including learning disabilities, sensory impairments and long-term health issues. • Types of support for children and adults with specific needs include residential care, respite care and domiciliary care.
Older Adults	• Older adults may need support with a range needs including arthritis, cardiovascular disease, dementia and depression. • Types of support for older adults include residential care, carers and personal assistants.
Informal Social Care	• Not all carers get paid for what they do – they are known as informal carers and social services would really struggle without them. • Informal carers include a spouse or partner, children, friends and neighbours. • Informal carers do practical household duties, shopping, laundry, walk the dog and help with personal care.

Year 10 BTEC Health and Social Care- Component 2: Health and Social Care Services and Values.

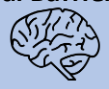
What we are learning:

A. Key words
B. What are the different types of health care services?
C. What are the different types of social care services?
D. What barriers are there to accessing care services?

A.	Key words for this Unit
Primary care	
NHS	
Secondary care	
Tertiary care	
Allied health professionals	
Clinical support staff	
Foster care	
Residential care	
Respite care	
Domiciliary care	
Sensory impairment	
Braille	
Occupational therapist	

B	What are the different types of health care services?
Primary Care	• Primary care is….. • Primary care providers include….
Secondary Care	• Secondary care is…. • Secondary care providers include…..
Tertiary Care	• Tertiary Care is…… • Tertiary care areas include……
Allied Health Professionals	• Allied health professionals…. • Allied health professionals include….
Clinical Support Staff	• Clinical support staff…. • Clinical support staff include….

C.	What are the different types of social care services? Explain them.
Children and young people	
Children or adults with specific needs	
Older Adults	
Informal Social Care	

D.	What barriers are there to accessing care services?
Physical Barriers 	• Difficulty accessing care due to mobility and/or disability. • Obstacles include uneven and rough pavements and services, narrow doorways, no lift and transport. • Access could be improved by planning journeys in advance and reporting any problems to the council.
Sensory Barriers 	• Sensory impairments can be a barrier to accessing care. • A person with poor vision may need glasses or documents in large print. Profound sight problems may benefit from Braille. • A person with a hearing impairment may benefit from a hearing aid or sign language interpreter.
Social, Cultural and Psychological Barriers 	• Social, cultural and psychological barriers may leave people feeling nervous about accessing support. • These can include: religion/cultural barriers, negative experience, self-diagnosis, substance misuse, opening hours. • Care services can give individuals opportunities to share their concerns, offer different gender practitioners, facilities to worship and show respect and understanding.
Language Barriers 	• Language can be a barrier to accessing care services because individuals and care providers may struggle to understand each other. • Support for individuals could include translated documents, translators and interpreters and support from family members.
Geographical Barriers 	• Individuals may struggle to reach care services because public transport may not run regularly, specialist treatments may require long distance travel and travel can be expensive. • Support could include being provided with direct travel or having travel costs reimbursed.
Intellectual Barriers 	• If an individual has a learning disability is can cause difficulty in them accessing care services. • Support might include a learning disability nurse, speech and language therapist or occupational therapist.
Resource Barriers 	• As the population ages and more disorders are being successfully treated, there is a huge strain on health and social care resources – at times it might seem that not everyone can access what they need. • There are huge staff shortages which puts strain on people that work in the health and social care sector.
Financial Barriers 	• Seeing a GP or using emergency services are free but some services, such as optical and dental care, often involve some payment. • This can be difficult for people if they are from a low-income household as they may not feel they can afford to access the care they need.

D.	What barriers are there to accessing care services? Explain them in detail.
Physical Barriers 	
Sensory Barriers 	
Social, Cultural and Psychological Barriers 	
Language Barriers 	
Geographical Barriers 	
Intellectual Barriers 	
Resource Barriers 	
Financial Barriers 	

Year 10 BTEC Health and Social Care- Component 2: Health and Social Care Services and Values.

What we are learning:

E. Define the key words
F. What are the care values and how can they be implemented?

E.	Define the key words
Self-respect	Valuing yourself
Person centred approach	Planning care around the wants and needs of a service user
Empowerment	Supporting people to take control of their lives and futures by involving them decisions on their care and treatment
Confidentiality	Not passing on information or discussing a private conversation to anyone
Dignity	Being respected and treated with care
Safeguarding	Policies to ensure children and vulnerable adults are protected from harm, abuse and neglect
Discrimination	Treating a person or group of people unfairly or less well than others
Compassionate	Feeling or showing sympathy and concern for others
Competence	The ability to do something successfully and efficiently
Consequences	A result or effect, typically one that is unwelcome or unpleasant
Review	Involves assessing or inspecting something with the intention of making change if necessary
Empathy	Being able to understand and share feelings and views of another person.
Insomnia	Difficulties in sleeping

F.	What are the care values and how can they be implemented?
Empowering and promoting independence 	• Empowerment is when an individual feels in control of their own life and have a say in what happens to them. • Some people might need help with empowerment because of their age, circumstances or confidence e.g. elderly people, children, adult with learning disabilities. • You can promote empowerment and independence by involving individuals, where possible, in making choices about their treatment.
Respect for others 	• You can show respect for the individual by respecting their privacy, needs, beliefs and identity. • Show respect by being patient when someone takes longer to perform simple tasks due to their age, disability or injury. • Do not leave personal files around for others to see or discuss your patients' case with friends. • Gain permission before entering a room, provide private place for personal conversations.
Maintaining confidentiality 	• It is a person's right by law to have information about them kept confidential. • Care workers and not allowed to talk about one service user to another, or someone who is not involved in helping them get better. This involves not having those private conversations in public places where other can overhear. • Paper and electronic files are to be kept confidential and only shared with care workers which are involved in the treatment of the patient.
Preserving dignity 	• Preserving the dignity of individuals to help them maintain self-worth, privacy and self-respect. • You do this by involving the person in their own care; helping them go to the bathroom; giving the person time they need, checking what they would like to be called; closing door or curtain when they are changing; making sure their clothes are clean; dealing with embarrassing situations sensitively and professionally.
Effective communication 	• In health and social care it is important to communicate effectively with service used in order to build trusting relationships. These can be lost of the care worker appears not to care or listen. • Recognising different communication needs and trying to overcome them shows that cares respect the individual e.g. when visually impaired providing a leaflet in braille; if can't speak English well, have a translator organised beforehand. • Show you value the person through showing empathy, asking questions, not judging, smiling, using their name, giving appropriate eye contact, open body language, giving time to process.
Safeguarding and duty of care 	• Health and social care workers have a legal duty to protect service users from harm, neglect or abuse. They must recognise the signs and symptoms of abuse so they can protect people. • Signs of abuse include low self-esteem, STDs, unexplained injuries or bruises, insomnia, change in appetite, change of personality, self-harming, fear of being alone etc. • What to do: report the abuse, never promise to keep the abuse secret, make it clear that you will have to tell someone e.g. your supervisor or the police. DUTY OF CARE • Care workers must work in ways that never put individuals at any risk or harms. They need to know their responsibilities, procedures, deliver care as the care plan states and always report and record any concerns about the service user even if they appear minor.
Promoting anti-discriminatory practice 	• Discrimination can be obvious but sometimes it can be subtle and hidden, and The Equality Act 2010 makes it illegal to discriminate against people because of their e.g. age, gender, race, disability, religion, sexual orientation, marital status etc. • You can promote anti-discriminatory practice by: having patience with someone who doesn't speak English well; communicating in a way that the person will understand; showing tolerance towards people who have different beliefs and values from you; challenging unkind behaviour.

Year 10 BTEC Health and Social Care- Component 2: Health and Social Care Services and Values.

What we are learning:
E. Define the key words F. What are the care values and how can they be implemented?

E.	Define the key words
Self-respect	
Person centred approach	
Empowerment	
Confidentiality	
Dignity	
Safeguarding	
Discrimination	
Compassionate	
Competence	
Consequences	
Review	
Empathy	
Insomnia	

F.	What are the care values and how can they be implemented? Explain in detail.
Empowering and promoting independence 	
Respect for others 	
Maintaining confidentiality 	
Preserving dignity 	
Effective communication 	
Safeguarding and duty of care 	
Promoting anti-discriminatory practice 	

Year 10 BTEC Health and Social Care- Component 2: Health and Social Care Services and Values.

What we are learning:
G. How to apply care values in a compassionate way. H. Identifying own strengths and areas for improvement against the care values

G	How to apply care values in a compassionate way?
Show empathy and care by:	• Being patient • Showing sensitivity • Understanding • Actively listening • Having a positive outlook • Being encouraging • Having genuine concern for other people.

Care workers can check themselves against the '**Six C's of Compassionate Care**' checklist to make sure they are applying care values with compassion.

Care	Helps to improve an individual's health and wellbeing. Care should be tailored to each person's needs and circumstances
Compassion	Shows the care worker understands what the individual is experiencing. Being empathetic to their situation shows care and value to the individual
Competence	Shows that care workers can safeguard and protect individuals from harm
Communication	How to adapt to individuals and their circumstances to ensure important information is given and shared- keeping the individual at the heart of everything that is done
Courage	Protecting individuals by speaking up if you think something is wrong; being brave enough to own up if you have made a mistake.
Commitment	Carrying out your duties to care for others to the best of your ability.

H	Identifying own strengths and areas for improvement against the care values
Working together	• All care works have the responsibility to uphold care values. If everyone works together, doing their 'bit', service users and colleagues alike will all be able to have positive experiences. • Put any feelings aside, some clients can show anger or aggressions towards you, continues to work in a way that respects each of the care values. Staff training: • Staff training keeps everyone updated. Even if they also ready had care values training it is important to have it again and remind them of their importance.

Making mistakes	• Everyone sometimes make mistakes. It is crucial that staff own up to mistakes that they have made, not matter how small. This is part of the duty of care to safeguard individuals, it demonstrates respect.
	• You need to be honest about your mistake, do not pretend it never happened and do not blame someone else.
	• You can:
	  • Tell your supervisor, admit it and apologise
	  • Be honest and accurate about what happened,
	  • Suggest ways to avoid it happening again
	  • Earn back the trust of the person involved
	  • Prove you can do the job
	  • Do no be too hard on yourself; seek help and guidance from others.

Reviewing own applications of care values	• One way to improve skills is to look carefully at the areas you are good at, what you are able to do well and things that you find difficult. • Knowing your strengths will allow you to take on task with ease and make you feel confident that you are doing a good job. • Knowing your weaknesses and what needs improving will help you work on them and develop. It is important to be open with yourself and others in order to progress further and be better at your job. • Regularly review your strengths and weaknesses because they change overtime
Receiving feedback	• The purpose of feedback is to let you know what you are doing well and the areas you need to improve. • This can be formal- like reports and following an observation at work and Informal- like chatting to colleagues at break time. • Both types encourage you to feel pleased with what you have done well and motivate you to improve in weaker areas, perhaps even provide a way forward. • Remember: when giving and receiving feedback, positives must be noted so that you know what you are doing well and continue to do so. Negatives are hard to uncomfortable to hear, but do not take them personally, you need them to get better at your job and feel more confident.
Using feedback	• Create yourself a SMART action plan to set yourself Specific, Measurable, Achievable, Realistic and Time-related targets or goals to help plan for your improvements

Year 10 BTEC Health and Social Care- Component 2: Health and Social Care Services and Values.

What we are learning:
G. How to apply care values in a compassionate way. H. Identifying own strengths and areas for improvement against the care values

G	How to apply care values in a compassionate way?
Show empathy and care by:	• • • • • • • •
Care workers can check themselves against the '**Six C's of Compassionate Care**' checklist to make sure they are applying care values with compassion. **EXPLAIN THEM:**	
Care	
Compassion	
Competence	
Communication	
Courage	
Commitment	

H	Identifying own strengths and areas for improvement against the care values. EXPLAIN WHAT THEY ALL MEAN AND INVOLVE.
Working together	
Making mistakes	
Reviewing own applications of care values	
Receiving feedback	
Using feedback	

Popular Music

Area of study 4 - Eduqas GCSE Music

Popular music includes:

- POP
- ROCK
- RAP
- HIP HOP
- REGGAE

Plus many other genres, e.g. soul, ska, heavy metal, R&B, country, rock'n'roll.

FUSION: when two different styles are mixed together. This can be two styles of popular music e.g. 'rap metal', or could combine a popular music genre with other styles, folk-rock, gospel, world music, classical to create a new and interesting sound. **Jazz fusion** (jazz and pop) is a popular genre.

Instruments

ELECTRIC GUITAR:

- Lead guitar: plays the melody/ solos/riffs
- Rhythm guitar: plays the chords/ accompaniment.

BASS GUITAR: plays the bass line.
DRUM KIT: provides the beat.
LEAD SINGER: the main vocalist.
BACKING VOCALS: singers who provide harmony.

Pop/rock groups may also include acoustic (not electric) instruments e.g. trumpet, trombone, saxophone and/or electronic keyboards/synthesizers.

The structure of a pop/rock song may include:

INTRO: short opening section, usually instrumental.
VERSE: same music but different lyrics each time.
CHORUS: repeated with the same lyrics each time (refrain).
MIDDLE EIGHT: a link section, often eight bars, with different musical ideas.
BRIDGE: a link/transition between two sections.
OUTRO: an ending to finish the song (coda).
*You may also hear a pre-chorus, instrumental interlude or instrumental solo.

***Strophic songs, 32 bar songs (AABA) and 12 bar blues are also found in popular music.**

A typical rock ballad in verse-chorus form could follow the pattern:

- Intro
- Verse 1
- Chorus
- Verse 2
- Chorus
- MiddleEight
- Chorus
- Outro

Features and techniques found in popular music

Riff	A short, repeated pattern.
Hammer on	Finger brought sharply down onto the string.
Pitch bend	Altering (bending) the pitch slightly.
Power chords	A guitar chord using the root and 5th note (no 3rd).
Distortion	An effect which distorts the sound (creates a 'grungy' sound).
Slap bass	A percussive sound on the bass guitar made by bouncing the strings on the fret board.
Fill	A short, improvised drum solo.
Rim shot	Rim and head of drum hit at same time.
Belt	A bright, powerful vocal sound, high in the chest voice.
Falsetto	Male voice in a higher than usual range.
Syllabic	One note sung per syllable.
Melismatic	Each syllable sung to a number of different notes.
A cappella	Voices singing without instrumental accompaniment.

Technology

Amplified	Made louder (with an **amplifier**).
Synthesized	Sounds created electronically.
Panning	Moving the sound between left and right speakers.
Phasing	A delay effect.
Sample	A short section of music that is reused (e.g. looped, layered).
Reverb	An electronic **echo** effect.

Question	Answer	Question	Answer
Give the term used for a **short, repeated pattern**		Which instrument provides the **main beat of a song**	
Give the term used when **one note is sung per syllable**		Give the definition of **Reverb**	
Which feature creates an effect which **distorts the sound (creates a 'gruny' sound).**		Circle the genre that **IS NOT** a form of popular music.	**Rock** **Pop** **Romantic** **Hip Hop**
Give the definition of **Backing Vocals**		Which technique is used when **each syllable is sung to a number of different notes?**	**Falsetto** **A cappella** **Melismatic**
Circle the part of a song which is a **link/transition between two sections**	**Chorus** **Outro** **Bridge** **Middle-Eight**	List **4 instruments** used in a pop/rock group	
Give is the term given when **two genres of music are mixed together e.g. Rap Metal.**		What role does a Rhythm Guitar have in a pop/rock group?	
Give the definition of **Sample**		Give the term used when a **Male voice is in a higher than usual range**	
Circle the correct term used when a **short improvised drum solo is used**	**Rim shot** **Belt** **Hammer on** **Fill**	Give the definition of **Verse**	

Interpreting Theatre – COMPONENT 3 – eduqas GCSE DRAMA SECTION B - 15 marks

Question Focus on Acting

Remember you are:

- evaluating and analysing a live theatre production
- spending about 25 minutes answering this section
- choosing one of the two options
- naming the performance, the company and the location.

Remember: The questions can vary and focus on the actor's use of PHYSICAL SKILLS, VOCAL SKILLS, INTERACTION, INTERPRETATION OF CHARACTER.

Important Things!

Remember: Please read the question carefully, use the bullet points to help you. Give your personal OPINION as a member of the audience.

PHYSICAL SKILLS:

You will need to specify how the actor interprets the character through his use of gestures, posture, walk, physical responses, facial expressions, position on the stage, special territories, stillness, use of space, set and personal equipment and props. To begin with, briefly mention the character, background, age, importance and social status because all of this is dependent on the actor's interpretation of the role he/she portrays. You can then specify and give examples of how the actor succeeded in physically conveying the character in a scene OR two scenes of the production in question (read the question carefully). You can give examples from the beginning, middle and end of the scene in order to organise the answer.

Remember to use plenty of terminology.

VOCAL SKILLS:

You will need to specify how the actor interprets the character through their use of tone and vocal tempo, perhaps accent, pitch, emphasis on words, use of pauses to create tension, pronunciation and constructiveness. Choose a specific scene or two, and discuss how the actor used the skills to create and enrich the role. You can refer to the character's background, age, status and motivation in this particular part. You can refer to the beginning, middle and end of a scene of your choice and elaborate on the skills associated with the voice.

Remember to use plenty of terminology.

INTERACTION SKILLS:

You will need to specify how the actor responds to the rest of the actors on stage, the distance and proximity between them and what was the significance of this. Was the actor moving deliberately to suggest a feeling or emotion? The actor may be using a series of facial gestures and responses, e.g. folded arms, eyes rolling, scrunched face, walking back and forth, pointing or back turned. Remember that the impact of this on the rest of the actors needs to be explained and how this succeeded in causing tension, a feeling or an emotion. What was the impact of this on the audience? Decide on specific examples from a scene or two scenes - once again, it depends on the question.

CHARACTER INTERPRETATION:

The character (or characters) in question will need to be discussed in terms of age, social class, intent and motivation, background and their relationship with the rest of the characters in the scene. Explain how the actor used the physical skills to interpret the role, then the vocal skills and interaction skills. Stick to the order of referring to the beginning, middle and end of a scene or scenes to organise your answer.

Remember to use the appropriate terms.

Interpreting Theatre – COMPONENT 3 – Eduqas GCSE DRAMA SECTION B - 15 marks Question focus on design

Remember: Questions can vary and can focus on the following: LIGHT, SOUND, SET and PROPS, COSTUME, MAKE-UP and HAIR, ATMOSPHERE and MOOD, and USE OF SPACE.

COSTUMES MAKE-UP AND HAIR:

You will need to start by discussing the production style, e.g. Musical, Naturalistic or Symbolic Drama; then the period, venue and time. Choose the characters that are a good example of costume, make-up and hair design. You can discuss the costume's fabric, colours and style. The colour might symbolise the character's emotion or motivation and helps the interpretation. You can discuss the costume in detail from head to toe, giving your opinion on the effectiveness of design. Also discuss the costume's condition and quality and also how this lead the audience to judge or sympathise with the character.

Remember - The hair and make-up will need to be discussed and their effect explained, e.g. messy hair, white make-up, a lot of lipstick.

USE OF SPACE:

Explain what was the set's production style and also, was it essential to the shape of the stage? This will give an idea of the size of the space. The stage might be narrow and the set might be bare to give fair attention and a chance for the actors to use as much space as possible. If so, how were the locations created? Was there a change in atmosphere? Did a particular light suggest that? Were simple levels changed from one area of space to another? Was the space meant to be closed in order to create the theme of frustration and boredom? How did the actors make the most of the space they had? If the production was on a wide stage, there would be an opportunity to use several resources, sets, levels and rostra to create locations. Actors' locations could vary frequently and move to create an atmosphere of excitement and vitality. There may be many actors and a chorus coordinating and making effective use of the space in one scene of the production. Remember, when discussing space, you will need to refer to the equipment in the space and characters' locations.

MOOD AND ATMOSPHERE:

Many theatrical resources can create mood and atmosphere in a production. But whilst referring to the designer's role, you could discuss the lighting, sound, costumes and set designer's work. However, one of these may have made more of an impression on you than the others. So, choose the show carefully, and initially, discuss the drama's style and context, e.g. Musical, Theatre Show in Education, production of Shakespeare's work, perhaps. Try to describe a scene (or scenes) that was/were full of tension and built tension amongst the audience, e.g. slowly increasing sound, the light fading or changing colour, the actor adding a piece of costume or using props in a symbolic way. A series of images on screen or a film might add to the mood. Theatre designers have so many possibilities to create mood and atmosphere.

LIGHT:

You will need to start by discussing the style of the production, e.g. Musical, Naturalistic or Symbolic Play, then the type of set and stage shape. The designer will have selected the types of light in order to reinforce this style. Choose a particular scene or scenes (depending on the question), which will be effective examples of lighting. You can discuss the types of lamps used, e.g. wash, fresnel, beams, profile and strength; and also the angles and how the set and actors were lit. Discuss the colours and gels and how this created an atmosphere. Gobos, cyclorama, a video screen or specific images might have been used. Lighting from the back can cast shadows and create a more sinister mood. The lighting for your production may be more simple but effective for different reasons, e. g. to emphasize themes or symbolize emotion.

SOUND:

You will need to start by mentioning the style of the production and then discuss how the sound enriched the show. The designer may have chosen the sound to match the period, social background of the play or specific themes. However, the designer may want to create a more vague or suggestive sound. Once again, the sound will have to be discussed in one scene or scenes. Sound can be a piece of music that's already been recorded or live music. It may also be a recorded sound effect or a live sound effect, e. g. a gun firing on or off stage, sounds off stage. Explain how the sound created a mood and atmosphere in this piece and helped the production to flow smoothly, or created a blanket in the background. You will need to mention the sound levels and volume and its impact, e.g. sinister or peaceful sound, classical or contemporary music; appropriate instruments to create a mood e.g. saxophone.

SET AND PROPS:

Comment on the style of the production and the design of the set. You will need to mention the shape of the stage, the drama period and the general appearance of the set, e.g. naturalistic, minimalistic, symbolic, bare. You can also discuss where the audience is situated in relation to the show, e.g. theatre in the round, traverse or proscenium theatre. Then proceed to explain the type of set used and how effective that was, e.g. painted flats, the colours and patterns; they may have been covered by material. The mobile platforms and rostrum that created a specific shape and location on the stage floor. Different levels that represented the status of particular characters or areas in the plays, e.g. scaffolding, the use of stage furniture and equipment, curtains and gauze. Consider the back of the stage as well and what was used to cover the walls, and also the ceiling and floor. You can discuss the materials, e.g. metal, wood or plastics, and also the colours used.

PROPS - Don't forget to discuss the props in terms of their period, colour, quality and condition and how they created impact and reinforced the production.

Interpreting Theatre –
COMPONENT 3 –
Eduqas GCSE DRAMA
SECTION B - 15 marks
Question focus on design

Have a go at answering these questions about the live performance you watched - Curious Incident

COSTUMES MAKE-UP AND HAIR:

USE OF SPACE:

MOOD AND ATMOSPHERE:

LIGHT:

SOUND:

SET AND PROPS:

Interpreting Theatre –
COMPONENT 3 –
Eduqas GCSE DRAMA
SECTION B - 15 marks
Question Focus on Acting

Remember: The questions can vary and focus on the actor's use of PHYSICAL SKILLS, VOCAL SKILLS, INTERACTION, INTERPRETATION OF CHARACTER.

PHYSICAL SKILLS:

You will need to specify how the actor interprets the character through his use of gestures, posture, walk, physical responses, facial expressions, position on the stage, special territories, stillness, use of space, set and personal equipment and props. To begin with, briefly mention the character, background, age, importance and social status because all of this is dependent on the actor's interpretation of the role he/she portrays. You can then specify and give examples of how the actor succeeded in physically conveying the character in a scene OR two scenes of the production in question (read the question carefully). You can give examples from the beginning, middle and end of the scene in order to organise the answer.

Remember to use plenty of terminology.

VOCAL SKILLS:

You will need to specify how the actor interprets the character through their use of tone and vocal tempo, perhaps accent, pitch, emphasis on words, use of pauses to create tension, pronunciation and constructiveness. Choose a specific scene or two, and discuss how the actor used the skills to create and enrich the role. You can refer to the character's background, age, status and motivation in this particular part. You can refer to the beginning, middle and end of a scene of your choice and elaborate on the skills associated with the voice.

Remember to use plenty of terminology.

INTERACTION SKILLS:

You will need to specify how the actor responds to the rest of the actors on stage, the distance and proximity between them and what was the significance of this. Was the actor moving deliberately to suggest a feeling or emotion? The actor may be using a series of facial gestures and responses, e.g. folded arms, eyes rolling, scrunched face, walking back and forth, pointing or back turned. Remember that the impact of this on the rest of the actors needs to be explained and how this succeeded in causing tension, a feeling or an emotion. What was the impact of this on the audience? Decide on specific examples from a scene or two scenes - once again, it depends on the question.

CHARACTER INTERPRETATION:

The character (or characters) in question will need to be discussed in terms of age, social class, intent and motivation, background and their relationship with the rest of the characters in the scene. Explain how the actor used the physical skills to interpret the role, then the vocal skills and interaction skills. Stick to the order of referring to the beginning, middle and end of a scene or scenes to organise your answer.

Remember to use the appropriate terms.

Interpreting Theatre –
COMPONENT 3 –
Eduqas GCSE DRAMA
SECTION B - 15 marks
Question Focus on Acting

Have a go at answering these questions about the live performance you watched - Curious Incident

Remember: The questions can vary and focus on the actor's use of PHYSICAL SKILLS, VOCAL SKILLS, INTERACTION, INTERPRETATION OF CHARACTER.

PHYSICAL SKILLS:

Remember to use plenty of terminology.

VOCAL SKILLS:

INTERACTION SKILLS:

CHARACTER INTERPRETATION: