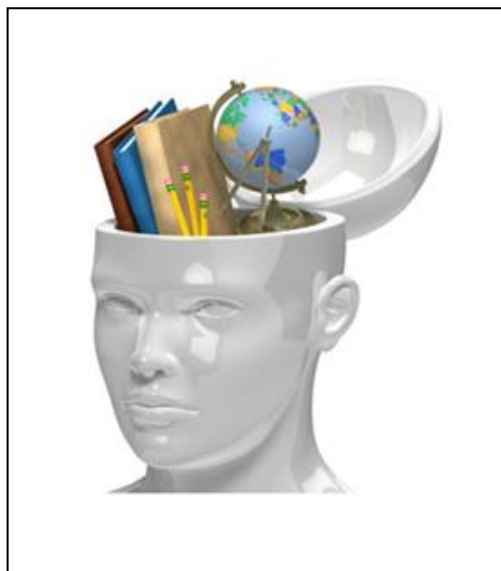**Name:**   **Form class:**

Year 11

Knowledge Organiser Autumn Term

What do I need to know?

1. How can business research increase sales.
2. Why is it important to understand your customer needs and competitors?
3. Why is it important to understand your current and potential demand?
4. What are the legal requirements for a business?

How can conducting research help a business to increase sales:

- Understanding their customers
- Producing a product or service the customer wants
- Making sure there is a market to sell to
- Knowing how many products or services to supply
- Target their advertising
- Identify new markets to sell to

What are the benefits of knowing more about your customer base?

- You can design the product or service to meet their needs, making them more likely to use or purchase it
- You can design your advertising to appeal to your customers
- You can find out how much they have to spend and where they like to spend it, for example, do they like to visit shops or shop online?
- You can buy the right amount of produce so you don't over or under purchase or produce too much stock.

Benefits of understanding your current potential demand

- If you underestimate the demand you will lose income because you will sell out of stock.
- If you overestimate the demand, you will buy too much stock which will affect your business cash flow.

What are the benefits of knowing more about your competitors?

- You can find out the 'market rate' for a product or service
- You can ensure that you can afford to offer your service or product
- You can find out what incentives your competitor is offering
- You can find out their availability
- Where and how do they advertise?

Key Words	Explanation
Legal entity	New businesses must be registered according to UK law and the business structure you have chosen.
Tax and VAT	Businesses must pay tax and if applicable VAT. They must register with HMRC.
Health & safety	There are many legal requirements in place to ensure that customers and employees are safe and are protected.
Business insurance	All businesses must have insurance to protect themselves and their customers.
Customer protection	Customers are protected by legislation to ensure the quality of goods and services they receive.
Data protection	There is strict legislation in place to protect customers from misuse of their personal data.

The Enfield Way is to LEARN

What do I need to know?

1. What are the physical resources a business needs to consider?
2. What are the technological resources a business needs to consider?

Physical Resources	Explanation
Business premises	You must consider the location of your business premises. There are lots of factors to consider. For example, your budget, the size, parking, near public transport, does it need to be near the customer base?
Fixtures and fittings	You need to think about the inside of the building and how it will be suitable for your particular business. Think about: budget, furniture, image of the business, legal requirements (toilets) and colour scheme/ branding.
Equipment	The equipment you need will depend on the type of business you are, for example, manufacturing, selling a product or providing a service. Could include tills, stock, IT equipment, machinery etc.
Transport	What are the transportation methods you will use? Think about road, rail, sea and air. How would each one benefit the type of business you are?
Raw materials	If you are making a product you will need to consider the raw material you need, where they will come from and where you will source them from. This may impact on the location of your business as you need to consider transport costs of the raw materials to the location where you will manufacture your goods/products.

Key Words

Raw materials	A raw material is the basic/ natural material used to make a product or service
Card and NFC readers	NFC stands for Near Field Communication which is a set of communication devices, one which is usually portable. They are used to take card payments. NFC is used for contactless payments.
EPOS	Electronic Point Of Sale and is an electronic way customers can pay for goods or services

Technological Resources	Explanation	+/-
Digital manufacturing	A method of production in which computer technology manufacturers produce with little or no involvement from people	+ Reduced staff costs + Efficient method of producing goods. + Less risk of human error - Cost of equipment & replacing adapting if product changes - Total shut down if mechanical breakdown
Digital communication systems	Methods of communicating digitally, for example, the internet or smart phones	
IT infrastructure	Refers to the business entire collection of IT equipment including, for example, computers, hardware , software, phones and tills.	

The Enfield Way is to LEARN

What do I need to know?

1. What are the methods of internal growth?
2. What are the methods of external growth?
3. How can each method apply to a business?

Key Word

Economies of scale	As a business grows, it benefits from a reduction in average costs of production.

Key Words

Internal growth	Growth from within the business.
External growth	Growth that happens outside of the business.

Internal Growth

Diversification	Business enlarging or varying its range of products or services. For example, a restaurant adding take away service for its customers. Fitbit diversifying into the kids market.
Geographical expansion	When a business increases in size and requires additional premises. For example, a restaurant opening a new restaurant in a different town.
Vertical growth	Vertical growth means expanding in the production process. This could include growing vertically to manufacture the goods, distribute, sell or offer after sales services.
Horizontal growth	Horizontal growth means expanding in the same area you already provide services or products. This can include buying a similar business to reduce competition and gain/increase their customers. For example, when Facebook bought Instagram.

External Growth

Merger	A merger is when two companies decide to join together. Why? • To reach new markets. For example, a clothes firm who offer mid-range clothes may merge with a high end clothes business. They both benefit as they now have access to each other's customers. • Better services for customers. For example, a bank may merge with an insurance company to offer the different range of services in one place which is more convenient to the customer and will make it more likely they will purchase the services. • Product development. This is expensive and risky. To reduce the risks and still benefit from the research and innovation a company may merge with another who has already carried out this developmental work. • Financial power. When companies merge they benefit from **economies of scale** as they reduce production and distribution costs.
Takeover	This is when a company (usually a larger one) buys out a rival. The business needs to be a public limited company for this to happen. Usually hostile. Lots of risks involved, such as price was too high, poor change in management and loss of key staff.
Joint venture	1. A joint venture is when two or more businesses join together for a specific project or business activity

Main Characters

Macbeth	Begins the play as the Thane of Glamis, a warrior loyal to King Duncan.	*aspirant rapacious obdurate jaded nihilistic callous merciless ambitious remorseless*
Lady Macbeth	At first, cajoles and manipulates Macbeth into taking power; later, loses control.	*manipulative Machiavellian nonchalant coercive aberrant self-reproachful pitiless*
Banquo	Macbeth's close friend who also receives prophecies—but does not act upon them.	*loyal virtuous ethical principled honourable incorruptible high-minded*
Duncan	The true King of Scotland, who puts his trust in the wrong men.	*trusting unsuspecting unguarded credulous respected sanctified venerated reverenced*
Malcolm	Duncan's son and true heir to the throne. Goes to England to raise an army.	*dignified intelligent resourceful capable inventive*
Macduff	A loyal warrior of King Duncan's and the Thane of Fife. Suspicious of Macbeth.	*vengeful remorseful Macbeth's nemesis consumed guilt-ridden implacable compelled*
Witches	Three women who seem to have supernatural knowledge and influence.	*prophetic cryptic enigmatic ambiguous double-dealing duplicitous disingenuous*

Some Themes

violence	The play begins and ends with violence. Macbeth and Banquo are praised for their violence by Duncan. Manhood and political power seem to be expressed by violence.
ambition	Political ambition is what seems to drive both Macbeth and Lady Macbeth. Ambition seems to be Macbeth's tragic flaw (*hamartia*).
evil	Macbeth clearly commits evil. Lady Macbeth is destroyed by her sense of her own evil. The witches seem to represent a form of evil.
regret	Macbeth, at the start, sees the murder of Duncan as regrettable. Lady Macbeth seems less concerned at the start, but becomes an isolated, remorseful character. Macbeth world views seems empty and nihilistic by the end of the play.
the supernatural	The witches: do they make Macbeth commit evil or just prompt something inside him? Do they need to be "magical" for the play to take place? Are the dagger and the ghost supernatural or psychological in origin?
appearance and reality	King Duncan admits that he was taken in by the former Thane of Cawdor. Lady Macbeth uses her skills of deception to murder the king. Macbeth comes to doubt the witches.
the unnatural	Lady Macbeth is unnatural in her discussion of herself. Macbeth's usurpation of the proper king is unnatural. Unnatural events occur surrounding the murder.
gender	Lady Macbeth seems to dislike her femininity. She also accuses Macbeth of lacking manly bravery. The play seems to equate masculinity with violent action.

Plot

Act 1	The play opens with three witches who set the scene and atmosphere for the play. Macbeth and Banquo have just helped win a battle for King Duncan. Returning from the battle, they meet the witches — who provide prophecies for both Banquo and Macbeth. King Duncan is so grateful for Macbeth he decides to stay at their castle when Macbeth returns. Macbeth writes a letter to his wife about the prophecies and being King. Lady Macbeth creates a plan to murder the King so they will become King and Queen. Macbeth does not want to kill Duncan to begin with, but lady Macbeth cleverly manipulates him into doing so.
Act 2	Macbeth is unsure about murdering Duncan — even seeing a ghostly bloody dagger — but finally he goes through with the plan. He is deeply disturbed by his actions, so Lady Macbeth finishes the plan by wiping blood on the guards. Macduff arrives in the morning and finds the slaughtered king; Macbeth kills the guards, helping make them seem guilty. Malcolm and Donalbain, the kings' sons, flee Scotland in order to stay alive.
Act 3	After Duncan's death, Banquo begins to think that Macbeth was the true murderer. In order to keep this a secret, Macbeth pays murderers to kill Banquo and his son, Fleance — but Fleance escapes. Macbeth holds a banquet for all the other lords at his castle. At this banquet, Macbeth sees the ghost of Banquo. Macbeth begins to rant and rave, making the guest uneasy. Macbeth notices that Macduff did not attend their feast. He decides to visits the witches again.
Act 4	Macbeth becomes obsessed with power and begins to ask the witches for more prophecies. The witches tell Macbeth that he should be fearful of Macduff, that he cannot be killed by man, and that he should only fear when the Dunsinane wood begin to move. Macbeth sends murderers to kill Macduff's family. In England, Macduff joins Malcolm to defeat Macbeth. Macduff learns of his family's murder and vows revenge upon Macbeth.
Act 5	Lady Macbeth has become insane over her involvement in the murders. Outside Macbeth's castle, an army gathers to attack. Macbeth is not overly worried as he believes the prophesy that no man can kill him, will protect him. Lady Macbeth kills herself. The battle begins—and Macbeth sees the wood advance towards the castle. Macduff confronts Macbeth and learns that Macduff was ripped from his mother's side and not naturally born. Macduff then kills Macbeth in a final battle where he beheads him. Malcolm now becomes the rightful king of Scotland.

Some Context

- first performed 1606; Jacobean period
- belief in the Great Chain of Being and the Divine Right of Kings and...
- the threat of chaos if these are ignored
- religion and the fear of divine punishment
- belief in witchcraft and King James I's *Demonologie*
- the Gunpowder Plot of 1605 and the fear of regicide and political turmoil

Some Tragic Theory

- **hamartia**: error of judgement, tragic flaw
- **hubris**: excessive pride or self-confidence
- **anagnorisis**: moment of realisation of wrong-doing
- **catharsis**: purging of emotions of the audience
- **tragic hero**: the main protagonist in the tragic action (not necessarily "heroic" in usual terms)
- **fate**: a cause of downfall which is outside of the control of the tragic hero
- **pathos**: feelings of pity and sympathy
- **peripeteia**: the reversal of fortune experienced by the tragic hero
- **megalopsychia**: the greatness of soul of the tragic hero, the qualities which *could* have made him great and honourable

Some Useful Terms

- **soliloquy**: character speaks their own, usually exploring deepest thoughts
- **aside**: character says something on stage which others cannot hear
- **dramatic irony**: when the audience understands more than characters on stage
- **foreshadowing**: when a text hints forward to later events/ideas

Theme A- Relationships and families

HOMSEXUALITY

Christian attitudes on homosexuality	Muslim attitudes on homosexuality
Roman Catholic Christians are against to homosexual acts. They should remain celibate to avoid sinful acts.	Homosexuality is against the will of God. This is stated in the Qur'an and the Hadith.
The Church of England welcomes homosexual Christians who live in a faithful, committed relationship, but not allowed to marry in church.	Homosexual relationships are (Haram) forbidden in Islam. In most Islam countries, homosexuality is against the law and the law of God.
Quakers believer homosexual relationships to be just as holy as heterosexual relationships.	Punishment for engaging in homosexual acts is sometimes severe in Muslim countries e.g. death penalty/stoning.
Many Christians see heterosexual relationships as part of God's plan.	Some Muslims believe that homosexual acts will not be punished on earth, but they will be judged on the day of judgement.

SEX BEFORE MARRIAGE

CONTRACEPTION- Contraception is the method used to prevent a pregnancy from taking place.

Christian attitudes on contraception	Muslim attitudes on contraception
Fundamental Christians (R/C) teach that artificial contraception goes against the natural purpose of procreation.	Most Muslims accept that the married couple should be all to decide when they will start a family. Children are a gift from God.
Anglicans (CofE) allow contraception as it gives couples a chance to plan when they want to have children.	Some Muslims believe that contraception is wrong, as it interferes with God's plan.
Catholics teach that contraception is sinful as it goes against God's plan. Catholics use the rhythm method.	Muslims prefer natural methods of contraception however artificial methods can be used e.g. condom

List different methods of contraception under these headings

Barrier	Condoms, diaphragm, cervical cap, spermicidal foam
Hormonal	The pill, patch, injections, implant
Surgical	Sterilisation male and female

Define the key term cohabitation.

TYPES OF FAMILIES

Nuclear	Two parents with their own biological or adopted children.
Extended	A family unit including extra relatives such as grandparents
Single Parent	One parent with his or her own child. This could be due to bereavement, or the end of a relationship between the parents, for example.
Same-sex parents	Parents of the same gender. They could have adopted, or one could be the biological parent of the child/children.
Reconstituted /blended	At least one moment of the couple has at least one child from a previous relationship living with them.

Explain the Christian teachings about the purpose of the family.
- **Procreation** to fulfil God's command.
- To provide a stable family home, this provides **stability for society**
- **Protection of children** is an important part of family life.
- **Educating children in the faith,**
- **Upbringing parents** should be good **role models** for their children.

Explain the traditional roles of men and women

sex before marriage	sex before marriage
Fundamental Christians (R/C) believe that sex should be experienced within a marriage, so sex before marriage is wrong.	Muslims believe that casual sex is wrong. Sex needs to be treated carefully and managed responsibly.
Quaker Christians believe that sex before marriage is allowed if you are in a loving relationship and intend to marry in the future.	Muslims believe that casual sex can lead to promiscuity and other evils such as rape and deception.
Anglican (CoFE) Sex before marriage must be within permanent, loving relationships	The Qur'an forbids sex before marriage. Under Islamic law (Shari'ah) sex before marriage is considered like adultery and rape, to be zinah (a sexual offense).

Sex is a gift from God, for the purpose of procreation. Marriage is the foundation for a stable society.

SEX OUTSIDE OF MARRIAGE (ADULTERY)

Christian attitudes on sex outside of marriage	Muslim attitudes on sex outside of marriage
"You shall not commit adultery" Exodus 20:14	Islam teaches faithfulness in marriage. Adultery is a serious sin.
Jesus taught lust is wrong can lead to adultery. *"Any one that looks at a woman lustfully has already committed adultery with her in his heart "* Matthew 5:27-28	In Muslim countries under Shari'ah law, the punishment for adultery conviction is death by stoning.
Adultery breaks the promises Christian couples make before God during their wedding.	"And do not go anywhere near adultery: it is an outrage, and is an evil path" (Qur'an)

A couple living together and having a sexual relationship with being married to one another

Fundamental view on cohabitation	Liberal view on cohabitation
Catholic Church and Orthodox Jew is opposed to sex before marriage. *"The sexual act must take place exclusively within marriage. Outside of marriage it is always a grave sin"* Catechism 2390	Anglican and protestant Christians accept that people can live together in a faithful, loving and committed way without being married.

List five reasons people get divorced.

1. **Falling out of love**
2. **Adultery**
3. **Illness/disability**
4. **Inability to have children**

Write out different Christian views on divorce

- **Jesus view**- Jesus taught that anyone who divorced and remarried was committing adultery. *"Anyone who divorces his wife and marries another woman commits adultery against her. And if she divorces her husband and marries another man, she commits adultery."* Mark 10:11-12

- **Catholic Church**- teaches that a civil divorce cannot end a marriage between two baptised people because marriage is permanent. Marriage is a sacrament. Catholics not allowed to remarry if their partner is alive. **Annulment is allowed (ruling that a marriage never existed) in the Catholic Church.**

- **Other Christians**- believe that marriage is sacred but sometimes divorce is the lesser of two evils. Anglican Christians allowed to remarry in the Church.

- **Protestant Churches**- some accept civil divorce and allow remarriage in the church as long as the couple take the vows seriously.

Some people believe
- that men are the head of the family
- women should mainly stay at home and care for the children.
- Women not allowed to be priests

Now….
Christians believe that all people have been created as equals in the image of God. The command to love one's neighbour means that discrimination is wrong. Jesus treated women with respect and welcomed them as disciples.

"There is neither Jew nor Gentile, neither slave nor free, nor is there male and female, for you are all one in Christ Jesus." Galatians 3:28

This quote means that humans are all equal, as humans were made in the image of God. Everyone is equal as men and woman have the same opportunities.

"I will make your pains in childbearing very severe; with painful labour you will give birth to children. Your desire will be for your husband, and he will rule over you." Genesis 3:16

Explain what this quote shows about women in the Bible.

The literal interpretation of this quote show that women are inferior to men. As it shows that women should allow their husbands to rule over them. Women need to submit themselves to men. This shows that women are best suited for the home.

	French Travel and Tourism				
1	le bord de la mer	seaside	18	l'autobus [m]	bus
2	l'île [f]	island	19	l'avion [m]	plane
3	la visite	visit	20	le bateau	boat
4	durer	to last	21	le car	coach
5	à l'étranger	abroad	22	la voiture	car
6	le retour	return	23	la moto	motor bike
7	revenir	to come back	24	voler	to fly
8	rester	to stay	25	la montagne	mountain
9	logement	accommodation	26	la plage	beach
10	l'aéroport	airport	27	le sable	sand
11	le vol	the flight	28	la rivière	river
12	en retard	late	29	le lac	lake
13	la location de voitures	car rental	30	le monde	world
14	louer	to hire	31	en plein air	in the open air
15	la climatisation	air-con	32	l'Afrique [f]	Africa
16	l'auberge de jeunesse	youth hostel	33	l'Algérie [f]	Algeria
17	la place	a seat	34	l'Allemagne [f]	Germany

	French Travel and Tourism				
35	l'Angleterre [f]	England	52	la voile	sailing
36	la Belgique	Belgium	53	(ça) me plaît	I like it
37	la Chine	China	54	(ça) m'a plu	I liked it
38	l'Ecosse [f]	Scotland	55	le temps	the weather
39	l'Espagne [f]	Spain	56	Il faisait chaud	It was hot
40	les Etats-Unis [m]	USA	57	Il faisait froid	It was cold
41	la Grande-Bretagne	Great Britain	58	Il pleuvait	It rained
42	le Maroc	Morocco	59	Il y avait du soleil	Il was sunny
43	le Pays de Galles	Wales	60	célèbre	famous
44	la Suisse	Switzerland	61	un pays	a country
45	la Tunisie	Tunisia	62	en	in/to (fem. countries)
46	Douvres	Dover	63	au	in/to (masc. countries)
47	Londres [m]	London	64	à	in/to (cities/towns)
48	la Manche	English Channel	65	aux	in/to (plural countries)
49	la Méditerranée	Mediterranean	66		
50	les Alpes [f]	Alps	67		
51	britannique	British	68		

WORLD'S ESSENTIAL RESOURCES

Food

Food is important because it affects your health. The World Health Organisation says we need 2000-2400 calories per day to be healthy.
If you do not have sufficient food you become malnourished or suffer from undernutrition/undernourishment (*a poor diet with a lack of nutrients and vitamins*)
- Food surplus: North America, Europe, Australia, Russia, UK, USA
- Food deficit: Africa (e.g. Chad, Congo, Ethiopia)

Water

Water is important as we need it for our health and for economic development (agriculture, manufacturing, cleaning, drinking).
- Water surplus: areas where there is high rainfall and water storage (aquifers/reservoirs). E.g. USA, Canada, Europe, Russia
- Water deficit: areas where there is low rainfall and a lack of water storage. E.g. Africa, Brazil, Argentina, Australia, China.

Energy

Energy is important because it is used to build homes, heat homes, power machinery, make food...etc. It is also traded between countries and so helps a country develop.

HICs consume (use) far more energy than LICs and NEEs.
- LICs – use very little energy (few machines, lack of processed foods, few families use power in their homes).
- NEEs – use more energy (increase in factories = increased use of machines = more energy used).
- HICs – use the most energy (lots of energy used in industries and homes, people eat a lot of processed foods.

FOOD in the UK

40% OF FOOD IN THE UK IS IMPORTED.

Why?	➢ Food is cheaper to make food in LICs. ➢ Demand for exotic foods (mangoes, bananas) ➢ Demand for seasonal foods all year round. ➢ Some foods cannot be grown in the UK.
Problem:	Increase in food miles (distance travelled by food to our plate) = increase in carbon footprint (the amount of CO2 a country produces.

SOLUTION

Organic Farming	Small scale farming that produce local, seasonal food without the use of chemicals.
	• Uses natural predators instead of pesticides • Crop rotation is used instead of fertilisers • Grows seasonal food locally.
Disadvantage	It is usually more expensive because yields are low (less food is produced) and more people are employed, due to lack of machinery used. This means they need to charge a lot to make a profit.
Agribusiness	Large scale intensive farms that use lots of machinery and chemicals to increase food production.
	• Hedges are cut down = large fields • Machinery (combine harvester, tractors) • Fertilizers used to add nutrients to the soil • Technology – GM crops, hydroponics, high yielding varieties
Advantage	More food can be produced = less needs to be imported. Use of machinery = fewer people employed = cheap food.
Disadvantage	It can harm the ecosystem due to use of chemicals = water pollution.

WATER in the UK

Water surplus	Areas with high rainfall and low population (*Wales & Scotland*)
Water deficit	Low rainfall and high population (*south east England and parts of central England*).
Water transfer scheme	Water is moved from areas of surplus to areas of deficit. The government proposed a UK wide water grid in 2006, however it was not built due to high costs and impact on ecosystems. Some water transfer schemes do exist.

The demand for water in the UK has increased in recent years. In fact households use 70% more water. This is because:
- More wealth = more household appliances that use water
- Population increase & people wash more often

HOWEVER ONLY 27% OF WATER IN THE UK IS CLASSIFIED AS CLEAN.

Causes	• Fertilizers in farming go into rivers • Chemical waste from factories pollutes rivers • Sewage is pumped into the sea • Oil from cars and boats goes into rivers/sea
Impacts	• Waste from factories = toxic water = harm wildlife & humans • Fertilizers get into water = growth of algae = lack of oxygen and light in the pond = wildlife die (eutrophication) • Bacteria from sewage plants = diseases in river
Management	• UK has strict laws to control waste production and disposal • Chlorine added to water to remove bacteria. • Water treatment plants remove bacteria, algae and chemicals • Sewage systems are improved (e.g. the Tideway project in London)
Challenges of managing water quality	• Growing population = larger farms and more chemicals used. • Economic development = more factories = industrial waste • More fossil fuels burned = more pollution from power stations • Climate change

ENERGY in the UK

The UK's energy mix is...	• 52.6% fossil fuels, 21% nuclear energy, • 24.7 renewable energies
Fossil fuels will be used less because...	a) 75% of oil and gas reserves are gone b) 100% of coalfields are closed down c) The EU fines companies who release too many greenhouse gases
Renewable energies will be used more because...	The government has been investing in these sources.
Fossil fuels will continue to be used because...	a) Coal is cheap to import b) New nuclear stations and renewable energy infrastructure is expensive

Economic and Environmental impact of each energy type

Fossil Fuels	✗ Coal must now be imported from South Africa = expensive ✗ Fossil fuels release greenhouse gases = global warming. The impacts of global warming are expensive to fix ✗ Fossil fuels release greenhouse gases = global warming. ✗ Coal mines need land to be cleared = loss of habitats ✗ Waste from mines = visual and noise pollution ✓ Fossil fuels are reliable and cheap.
Renewable Energies	✗ New infrastructure (wind turbines/solar panels) expensive to build ✗ They are unreliable = often energy must also be purchased. ✗ Wind turbines and solar panels = visual and noise pollution and affect ecosystems. ✓ They do not release greenhouse gases (clean) ✓ Once infrastructure is created, it is cheap to create energy.
Nuclear Power	• Nuclear power stations are expensive to build (£18 billion) • Radioactive waste must be carefully stored = expensive. • Warm waste water can harm local ecosystems • Radioactive leaks harm people and wildlife (e.g. Chernobyl) ✓ It produces very little greenhouse gases ✓ Nuclear energy produces a large amount of energy.

Food consumption	Where food is eaten. High food consumption in HICs (*USA, Canada, UK, France*) and low food consumption: LICs (*many African countries*) Future development and population growth will affect food consumption patterns. • Countries with increasing populations need more food for the extra people. • As a country develops, people start to eat more meat and processed foods.
Food security	A population has access to safe, affordable, nutritious food to maintain a healthy and active life.
Food insecurity	When a population does not have access to enough safe, affordable and nutritious food.
Undernourishment	A poor diet with a lack of nutrients and vitamin

CAUSES OF FOOD SURPLUS/FOOD DEFICIT

WATER SUPPLY (physical)	• Reliable rainfall = food surplus as there is enough water to grow crops. Common in Bangladesh. • Lack of rain (droughts), too much rain (floods) = food deficit as crops as destroyed. Common in Africa. With current rates of climate change, 50% of the world's pop will be living with high water stress by 2030.
TEMPERATURE (physical)	• Extreme temperatures = deficit as crops cannot grow. • Mild temperatures = surplus as crops easily grow.
PESTS & DISEASES (physical)	• LICs crops are destroyed by more pests and diseases due to their warm climates and lack of pesticides and GM crops = food deficit. Pests include cattle diseases (e.f. Rift Valley Fever) or locusts attacking crops • HICs use GM crops and pesticides = less crops die = food surplus.
POVERTY (human)	• LICs cannot afford seeds, technology, irrigation, fertilizer = food deficit. • HICs can afford seeds, technology, irrigation, fertilizers, GM crops = food surplus
CONFLICT (human)	War = food deficit because: • Farmers are fighting/not farming. • Political corruption = aid doesn't reach most vulnerable. • Food is used as a weapon and kept from most vulnerable.

IMPACTS OF FOOD SURPLUS/FOOD DEFICIT

FAMINE & UNDERNUTRITION	Famine: the widespread shortage of food. Undernutrition: the lack of a balanced diet (not enough minerals/vitamins). *The UN estimates that 258,000 people died in Somalia during the 2010-12 famine. At the worst point, 30,000 people died each month. It was caused due to low rainfall and death of livestock (animals).*
RISING FOOD PRICES	• Shortage of food = increase in demand of food = increase in price of food. • In LICs the shortage of food can cause the price of basic foods (e.g. rice/maize) to become too expensive.
FOOD RIOTS AND SOCIAL UNREST	Shortage of food = increase in price of food = conflict as people fight over food. *In 2011, a food riot in Algeria lasted 5 days and killed 4 people. It was because the cost of cooking oil and flour doubled.*
SOIL EROSION	Soil erosion is when the top layer of fertile soil is removed by wind or water. It is caused by overgrazing, over-cultivation, deforestation and farming on marginal land. Often people are overgrazing and over-cultivating to increase food supply.

STRATEGIES TO INCREASE FOOD SUPPLY

The Green Revolution started in the 1960s. It aim was to increase food supply by using pesticides, Fertilizers and high yielding varieties of seeds. Unfortunately global population grew faster = not enough food produced.

The New Green Revolution was later introduced, which aimed to increase food production at the same rate as population rise through using:
✓ GM crops, irrigation, crop rotation and appropriate technologies (strategies that are appropriate to where they are being used)

Hyroponics	Plants are grown in a nutrient rich water.
Aeroponics	Plants are suspended in the air and their roots are sprayed with a fine mist of water and nutrients
Advantages	✓ The plants receive the exact amount of light, water, nutrients, fertilizers and pesticides they need = all crops are healthy and grow quickly. ✓ They are grown in tanks, which can be stacked on top of each other = more crops grown in same space. ✓ Crops stay fresh for longer as they continue to grow as they are being shipped. ✓ It uses less water than traditional farming in soil.
Disadvantages	× It requires expert knowledge/skills and can be expensive, therefore less suitable in LICs × Some consumers say the food doesn't taste as good as traditional farming.
Biotechnology	Plants are genetically modified (GM) to make them resistant. • *Resistant to pests, diseases, salty soils, droughts...etc.* • *Increase the vitamins in the crops or increase the food's shelf life.*
Advantages	✓ The use of GM maize in the Philippines has increased yields by 24%. Increased yields = more products are sold = higher income = people can buy more food.
Disadvantages	× Environmental: super weeds could develop, resistant to new crops × Social: increase in number of allergies in humans since using GM crops × Economic: they are expensive and require specialist knowledge therefore not always suitable for LICs.
Irrigation Advantages	Irrigation is the artificial watering of land. It means that crops always have enough water to grow = increase in crop yields (more crops produced). • Large scale reservoir and dams. Water from the reservoir is used to irrigate the crops. • Flood irrigation – the whole field is flooded. Some people do not like it because it can cause waterlogging and uses a lot of water. • Sprinkler – a sprinkler sprays water over fields. • Drip irrigation – crops are watered just where the plants' roots are. Water flows through a pipe that had holes in it, every point there is a root. It means water is not overused.
Disadvantages	× Irrigation can cause salinity – when irrigated water evaporates, leaving behind the salts and minerals on the soils and crops.

STRATEGIES TO INCREASE FOOD SUPPLY SUSTAINABLY
(increase food supply without harming the environment)

Organic Farming	Small scale farming that produce local, seasonal food without the use of chemicals.
Sustainable features:	✓ No chemicals are used. ✓ Rainwater is collected and recycled using water harvesting tanks. ✓ Natural predators are used instead of pesticides. ✓ Soil is kept fertile using manure/compost instead of fertilizers.
Disadvantage:	× *It is more expensive than mass produced food.* × *It is small scale. Not a lot of food is produced.*
Urban Farming	Gardens are created on unused land in urban areas (allotments). These gardens are used to grow food.
Sustainable features:	✓ Economic – people can sell their produce. ✓ Environmental – food does not travel far & brownfield sites are used.
Disadvantage:	× *It is small scale. Not a lot of food is produced.*
Seasonal Food	Food is only grown in the season it naturally grows in (e.g. strawberries in the summer and apples in the autumn).
Sustainable features:	✓ Food miles are reduced as food does not travel as far = fewer carbon emissions (reduced carbon footprint). ✓ Boosts local economy as local food is brought. ✓ Less energy is used to grow the food (no additional heat or light is needed).
Disadvantage:	× *There is still a demand for exotic food and seasonal food all year.*
Reduce Food Waste	If less food is thrown away, less food needs to be grown as less is wasted.
Disadvantage:	× *There are a lot of people to educate which can be difficult. Many people do not like to be inconvenienced.*
Sustainably sourced food	Educate people about sustainably produced food. This will increase the demand for sustainable food = less demand for unsustainable food sources.
Sustainable	✓ Buy meat from small scale (free range and organic) that use less energy
Disadvantage:	× *Do not buy meat from large scale intensive farms that use chemicals, lots of energy (in heating large indoor spaces) and produce lots of greenhouse gases.*
Sustainable	✓ Buy fish from fish farms that do not use chemicals, that use a pole and line, that use divers to catch shellfish, that only take the fish/shellfish they need, that meet EU requirements to only fish a certain amount.
Disadvantage:	× *Do not buy fish from large scale intensive fish farms that use chemicals, large nets (that catch all species rather than what they want) or that use seabed dredging to collect shellfish. This process lifts up the entire of the seafloor = ecosystems destroyed.*

THANET EARTH: A LARGE SCALE AGRICULTURAL DEVELOPMENT
Thanet Earth is located in east Kent, in the south east of England.

What?
➢ **5 greenhouses** grow seasonal food all year using **hydroponics**.
➢ Large lights give **artificial sunlight** = longer growing seasons = crops can be grown all year round.
➢ **Rainwater is collected** into 7 onsite reservoirs for irrigation
➢ Each greenhouse has its own power station providing its heat & lighting. The energy produced is sold and the waste produced (*carbon dioxide and heat)* is recycled. It is pumped back into the greenhouses to help the plants grow.

ADVANTAGES	DISADVANTAGES
➢ 500 jobs. ➢ More food grown in UK, therefore less food imported = better food security. ➢ Less imported food = less food miles = less carbon emissions. ➢ Natural predators are used = less chemicals (pesticides) used. ➢ Hydroponics system reduces waste. The exact amount of water, nutrients, fertilisers are used. This means crops grow up to 3 times as quickly = increasing food supply in the UK.	➢ A large area of green farmland was built on = habitats lost/ecosystem disrupted. ➢ Money goes to large companies rather than local communities. ➢ Greenhouses use artificial lights = very bright = visual pollution. ➢ Energy is used to power the greenhouses, package the food and transport it to the supermarkets = release of greenhouse gases.

THE MAKUENI FOOD & WATER SECURITY PROGRAMME:
A LOCAL SCHEME IN AN LIC/NIC TO INCREASE FOOD SUPPLY SUSTAINABLY
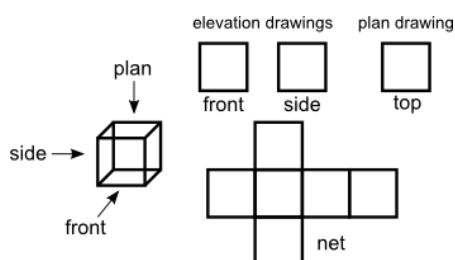
Where?	Makueni is located in south Kenya (east Africa), 200km south east from Nairobi. I has a population size of 885,000 and receives 500mm of rain per year. They grow crops to feed their population (maize, sweat potatoes, millet), however due to a lack of rainfall, poverty, pests and lack of technology they cannot have food insecurity.
What?	**In April, 2004, the charity 'Just a Drop' joined forces with the African Sand Dam Foundation and:** ➢ Built a water harvesting tank on the roof of the school ➢ Built a sand dam.
What is a sand dam?	• *A concrete wall is built across a river channel.* • *During Kenya's rainy season, water rushes down the slopes and picks up lots of sand/sediment. The concrete wall traps the water and sediment behind the wall. The trapped water has less energy = deposition of sediment.* • *Over the rainy season, more and more sediment is trapped and deposited behind the dam, until eventually the river behind the dam is filled with sand.* • *The sand is porous/permeable and so allows water to pass through. As a result, the sand behind the dam is saturated with water, acting as a aquifer.* • *In the dry season the top layer of the saturated sand dries, however the lower layers of sand are still full of water.* • *Water trapped in the sand can be accessed by pipes and used for irrigation, drinking or cleaning.* • *None of the water is lost due to evaporation in the hot climate.* • *It is sustainable because it is cheap, easy and does not require advanced technology or skills.*
How did it help?	✓ Crop yields increased as there was a reliable water supply. ✓ Waterborne diseases decreased as the sand filtered the water. ✓ Less time was wasted collecting water from far away streams = more time to study/work. ✓ Children at the schools in Makueni (e.g. Kanyenyoni Primary School (463 students) have access to a clean and safe water supply.

Timeline	Key Events/Knowledge	Individuals/Keywords
1958 – The refugee crisis in Berlin	Three million East Germans had crossed to the West in the hope of better living standards. Tension between the East and West led to Khrushchev's Berlin Ultimatum.	**Ultimatum** – A final demand, often backed up with a threat to take action
1959-1961 Summit meetings	The disagreements over Berlin led to three separate meetings between the superpowers.	**John F Kennedy** – US President replacing Dwight D Eisenhower **U-2 spy-plane** – An American single jet aircraft which was shot down by Soviet Air Defence Force
1961 – Building the Berlin wall	As a result of the refugee crisis, Khrushchev decided to order the work for a concrete wall which would stretch 165 kilometres. The aim was to keep Berlin separate from the rest of Germany	**Walter Ulbricht** – East German leader
1962 – Cuban Missile Crisis	Tension increased when American U-2 spy-planes took pictures of launch pads for medium range ballistic missiles which could carry nuclear warheads capable of causing terrible damage to US cities. Khrushchev took this highly provocative step as a response to the USA's missiles placed in Turkey. (NATO ally of the USA) After tense negotiations an agreement was reached and nuclear war was narrowly avoided.	**Fidel Castro** – Overthrew the pro-American government to become the communist leader of Cuba **Hawks** – People who supported going to war. People that preferred to find solution to problems without going to war were known as **Doves**
1968 – The Prague Spring	Alexander Dubcek introduced a number of reforms in Czechoslovakia which became known as the 'Prague Spring'. As a result, Soviet leader Brezhnev decided to send 500,000 Warsaw Pact troops and ended the Prague Spring.	**Alexander Dubcek** – Leader of Czechoslovakia during the Prague Spring **Leonid Brezhnev** – Leader of the Soviet Union replacing Khrushchev
1969-1979 – Détente	The Cuban Missile Crisis showed that even if the leaders of both superpowers didn't want war they could lose control of events: a devastating war could break out almost by accident. During the 1970's there was a genuine attempt to have a more co-operative and stable relationship. This policy has been referred to as 'détente'	**Richard Nixon** – President of the USA during SALT 1 **Détente** – A period of peace between two groups that were previously at war, or hostile to each other **MAD** – Mutually Assured Destruction
1979 - Soviet Invasion of Afghanistan	The USSR was determined not to let Muslim fundamentalism spread across its borders. In the aim of ensuring a pro Soviet government in Afghanistan, the Soviet Union invaded Afghanistan. This also ended the period of détente	**Gerald Ford** – President of the USA who signed the Helsinki Accords **Jimmy Carter** – President of the USA during SALT 2 **Economic sanctions** – Measures taken to damage a country's economy, usually through trade bans
1979-1985 – Reagan's Second Cold War	Reagan's views towards the USSR were made clear in a speech to a Christian group where he described the USSR as an 'evil empire' and also stated that the USA represented the forces of 'good'. This increased tension between the superpowers.	**Ronald Reagan** – President of the USA replacing Jimmy Carter
1985-1989 - Gorbachev's new thinking	Gorbachev was determined to reform communism in the USSR and he introduced a series of policies that would have a major impact on Soviet foreign policy and relations with the USA. This also resulted in uprisings within the Republics.	**Mikhail Gorbachev** – The final leader of the USSR **Glasnost** – Russian for 'openness' or 'transparency' it was used to describe Gorbachev's new, more open attitude to government and foreign relations. **Perestroika** – Russian for 'reconstruction' it was used to describe his programme for reorganising and restructuring the Soviet state
1989-1991 – Fall of the Berlin Wall & the reunification of Germany	For 30 years the Berlin Wall had stood for the division of Europe. It was a symbol of the Cold War and of Soviet control. On 9 November 1989 its destruction became the symbol of the end of Soviet control and the end of the Cold War.	**Erich Honecker** – Communist leader of East Germany

A) Angle facts - lines

1	Vertically opposite angles	are equal	
2	Angles on a straight line	add up to 180	
3	Angles at a point	add up to 360	
4	Alternate angles	are equal	
5	Corresponding angles	are equal	
6	Co-interior angles	add up to 180	

D) Congruence and similarity

15	The four congruency tests are….	SSS ASA SAS RASH
16	Triangles are similar if…	All angles are the same (AAA They are an enlargement of each other
17	Area scale factor	Length scale factor ^{2}
18	Volume scale factor	Length scale factor ^{3}

E) Area Formulas

19	Area of a rectangle	= length x width	
20	Area of a parallelogram	=base x perpendicular height	
21	Area of a triangle	=$\frac{1}{2}$base x perpendicular height	
22	Area of a trapezium	= ½ (a + b) x h	

B) Angle facts – triangles and quadrilaterals

7	Angles in a triangle	add up to 180	
8	Two angles of an isosceles triangle	are equal, tow sides are equal	
9	Angles in an equilateral triangle	are equal (all 60), all sides are equal	
10	Angles in a quadrilateral	add up to 360	

C) Angle facts - polygons

11	Exterior angles of a polygon	add up to 360°	
12	The interior and exterior angle of any polygon	add up to 180°	
13	The sum of the interior angles of a polygon can be found by using the formula	**(number of sides-2) x 180º**	
14	Regular polygons have all sides the same length and all angles the same size		

F) Volumes

23	Volume of a cuboid	= l x w x h	
24	Volume of a prism	= area of cross section x l	
25	Volume of a cylinder	= πr^2 x h	
26	Pyramid	= $\frac{1}{3} \times area\ of\ base \times h$	

G) Surface area

26	Surface area of a prism	The sum of the area of all the 2D faces
27	Surface area of a cylinder	$2 \times \pi r^2 + \pi d \times h$

"Half the sum of the parallel sides, times the distance between them
That is how you calculate
The area of a trapezium"

H) Circles

28	Circumference = $\pi \times d$	
29	Area = πr^2	
30	Area of a sector	$\dfrac{\theta}{360} \times \pi r^2$
31	Arc length	$\dfrac{\theta}{360} \times \pi d$

K) Describing Transformations

35	Rotation	• Direction (clockwise or anticlockwise) • Degrees • Centre of rotation
36	Reflection	• Line of reflection
37	Translation	• Vector $\begin{pmatrix} x \\ y \end{pmatrix}$ where x is the horizontal movement and y is the vertical
38	Enlargement	• Scale factor • Centre of enlargement

NUMBER

L) FDP

39	To find a % of an amount…	Find 10% (by dividing by 10) Find 1% (by dividing by 100)
40	100%	1
41	50%	0.5 or $\frac{1}{2}$
42	25%	0.25 or $\frac{1}{4}$
43	12.5%	0.125 or $\frac{1}{8}$
44	10%	0.1 or $\frac{1}{10}$
45	% increase	Find the % and add it on
	% decrease	Find the % and take it away
46	% change (% profit or loss)	$\frac{change}{original} \times 100$
47	Compound interest	**original x % multiplier** $^{\text{number of years}}$
48	Convert a fraction to a decimal	Make the denominator 10 or 100 OR Divide the numerator by the denominator
49	Convert a decimal to a %	X 100

"Factors come in two by two, hurrah, hurrah"

"Multiples are in the times tables…"

I) Pythagoras and Trigonometry

32	Pythagoras' Theorem For a right angled triangle is…..	$a^2 + b^2 = c^2$ c is always the hypotenuse!
33	The trigonometric ratios are 	$sin\theta = \dfrac{opp}{hyp}$ $cos\theta = \dfrac{adj}{hyp}$ $tan\theta = \dfrac{opp}{adj}$ SOHCAHTOA

J) Exact values

34		30°	45°	60°
	sin	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$
	cos	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$
	tan	$\frac{\sqrt{3}}{3}$	1	$\sqrt{3}$

Circumference is pi times diameter, pi times diameter, pi times diameter
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Area is pi r squared

M) Indices

50	$a^b \times a^c$ When <u>multiplying</u> terms with the same base….	a^{b+c} Add the powers
51	$\dfrac{a^b}{a^c}$ When <u>dividing</u> terms with the same base….	a^{b-c} Subtract the powers
52	$\left(a^b\right)^c$	a^{bc}
53	a^0	1

N) Standard form

| 54	0.0004	4 x 10⁻⁴ (the number must be between 1 and 10)
55	40000	4 x 10⁴ (the number must be between 1 and 10)

O) Special Numbers

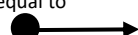| 56	A factor is	A number that divides into another number without a remainder, factors always come in pairs
57	A multiple is	A number in a given numbers times table
58	A square number	Is a number multiplied by itself: 1, 4, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225
59	A prime number	Has only two factors, one and itself: 2, 3, 5, 7, 11, 13, 17……

P) Conversions		
60	1 cm	10mm
61	1m	100cm
62	1km	1000m
63	cm → m	$\div 100$
64	m → cm	$\times 100$
65	cm^2 → m^2	$\div 100^2$
66	cm^3 → m^3	$\div 100^3$
67	1kg	1000g
68	1l	1000ml

T) Compound measures		
79	Speed	$speed = \dfrac{distance}{time}$
80	Density	$density = \dfrac{mass}{volume}$
81	Pressure	$pressure = \dfrac{force}{area}$

ALGEBRA

Q) Equations		
69	Like terms have what…	Same letter, same index

R) Inequalities		
70	$\leq$	Less than or equal to
71	$<$	Less than
72	$\geq$	Greater than or equal to
73	$>$	Greater than

S) Graphs		
74	$y = mx + c$	$m = gradient$ $\dfrac{Difference\ in\ y}{Difference\ in\ x} = \dfrac{y_2 - y_1}{x_2 - x_1}$ $c = y\ intercept$ (where the line crosses y axis)
75	To find the mid-point	$(\dfrac{x1+x2}{2}, \dfrac{y1+y2}{2})$
76	Parallel lines	Have the same gradient
77	Perpendicular lines	Gradient $= -\dfrac{1}{gradient}$
78	Roots or solutions are	The points at which the graph passes through the x-axis

DATA, RATIO AND PROPORTION

U) Correlation		
82	Positive correlation means…	As one variable increases the other variable increases, this looks like:
83	Negative correlation means….	As one variable increases the other variable decreases, this looks like:
84	No correlation means….	There is no relationship between the two variables, this looks like:
85	Line of best fit	A straight line drawn with a ruler that goes through the data with roughly the same number of points on each side of the line
86	Interpolation	Estimating a value within a given data set
87	Extrapolation	Estimating a value outside the give date set by assuming a trend

V) Averages		
88	Mean	Add all the numbers and divide by how many there are
89	Median	Order the numbers from smallest to biggest and find the middle number
90	Mode	Most frequent
91	Range	Difference between the highest and lowest value
92	Mean from a frequency table	$\dfrac{Total\ Fx}{Total\ F}$
93	Mean from a grouped frequency table	1. Find the mid point of each group 2. $\dfrac{Total\ Fx}{Total\ F}$

Mean is average, mean is average
Mode is most, mode is most
Median's in the middle, median's in the middle
Range high take low, high take low

W) Probability		
94	Probabilities of mutually exclusive events	Add up to 1
95	$P(A \cap B)$	Probability of A AND B
97	$P(A \cup B)$	Probability of A OR B

GEOMETRY

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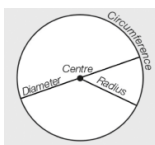
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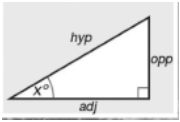
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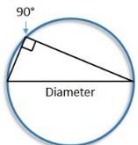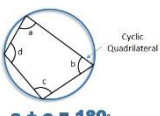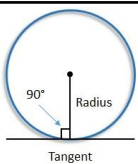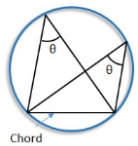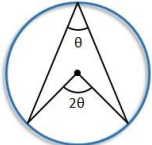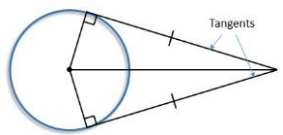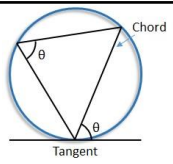| 40 | Rotation | • Direction (clockwise or anticlockwise)
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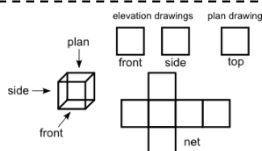
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36	Sine rule	$\dfrac{a}{sinA} = \dfrac{b}{sinB} = \dfrac{c}{sinC}$
37	Cosine rule	$a^2 = b^2 + c^2 - 2bc\,CosA$ $cosA = \dfrac{b^2 + c^2 - a^2}{2bc}$
38	Area of a triangle	$A = \dfrac{1}{2} ab \sin C$

J) Exact values

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	cos	$\dfrac{\sqrt{3}}{2}$	$\dfrac{\sqrt{2}}{2}$	$\dfrac{1}{2}$
	tan	$\dfrac{\sqrt{3}}{3}$	1	$\sqrt{3}$

L) Circle theorems

44	The angle in a semi-circle is 90		48	The angle at the centre is twice the angle at the circumference	
45	Opposite angles in a cyclical quadrilateral add up to 180		49	Two tangents from the same point are equal in length	
46	The angle between a tangent and a radius is 90		50	Alternate Segment Theorem	
47	Angles at the circumference in the same segment are equal				
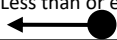
NUMBER

M) FDP
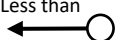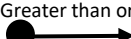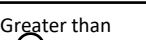
51	% increase	Find the % and add it on
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67	0.0004	4 x 10^{-4} (the number must be between 1 and 10)
68	40000	4 x 10^4 (the number must be between 1 and 10)
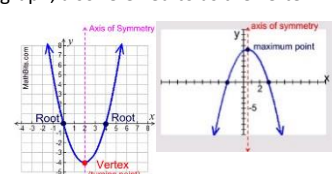
ALGEBRA

S) Equations

84	Like terms have what…	Same letter, same index

T) Inequalities

85	$\leq$	Less than or equal to
86	$<$	Less than
87	$\geq$	Greater than or equal to
88	$>$	Greater than

P) Surds

69	$\sqrt{a} \times \sqrt{b}$	$\sqrt{ab}$
70	$\frac{\sqrt{a}}{\sqrt{b}}$	$\sqrt{\frac{a}{b}}$
71	$\sqrt{a} \times \sqrt{a}$	a
72	$(\sqrt{a}+1)(\sqrt{a}-1)$	$a-1$

Q) Indices

73	$a^b \times a^c$	a^{b+c}
74	$\frac{a^b}{a^c}$	a^{b-c}
75	$(a^b)^c$	a^{bc}
76	a^0	1
78	a^{-b}	$\frac{1}{a^b}$
79	$a^{\frac{b}{c}}$	$\sqrt[c]{a^b}$
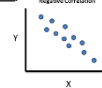
R) Special Numbers

80	A factor is	A number that divides into another number without a remainder, factors always come in pairs
81	A multiple is	A number in a given numbers times table
82	A square number	Is a number multiplied by itself: 1, 4, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225
83	A prime number	Has only two factors, one and itself: 2, 3, 5, 7, 11, 13, 17……
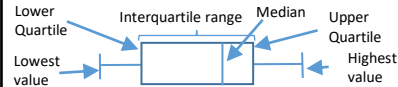
U) Equations of lines, curves and circles

89	$y = mx + c$	$m = gradient$ $\frac{Difference\ in\ y}{Difference\ in\ x} = \frac{y_2 - y_1}{x_2 - x_1}$ $c = y\ intercept$ (where the line crosses y axis)
90	To find the mid-point	$(\frac{x1+x2}{2}, \frac{y1+y2}{2})$
91	Parallel lines	Have the same gradient
92	Perpendicular lines	Gradient $= -\frac{1}{gradient}$
93	Roots or solutions are	The points at which the graph passes through the x-axis
94	The turning point	The maximum or minimum point of a graph, also referred to as the vertex
95	Equation of a circle	x^2 + y^2 = r^2 Centre (0,0) radius r

V) Quadratic formula and completing the square

96	$x =$	$\dfrac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
97	$x^2 + 2a + b$	$(x + a)^2 - a^2 + b$
98	$(x + a)^2 - b$	Completed square form where the turning point is (-a , +b)

W) Compound measures

99	Speed	$speed = \dfrac{distance}{time}$	
100	Density	$density = \dfrac{mass}{volume}$	
101	Pressure	$pressure = \dfrac{force}{area}$	

DATA, RATIO AND PROPORTION

Y) Correlation

112	Positive correlation means...	As one variable <u>increases</u> the other variable <u>increases</u>, this looks like:
113	Negative correlation means....	As one variable <u>increases</u> the other variable <u>decreases</u>, this looks like:
114	No correlation means....	There is <u>no relationship</u> between the two variables, this looks like:
115	Line of best fit	A straight line drawn with a ruler that goes through the data with roughly the same number of points on each side of the line
116	Interpolation	Estimating a value within a given data set
117	Extrapolation	Estimating a value outside the give date set by assuming a trend

AA) Data Representation

115	Box plots	

AC) Proportion

133	Direct proportion	$y \propto x$ $y = kx$
134	Indirect proportion	$y \propto \dfrac{1}{x}$ $y = \dfrac{k}{x}$

X) Functions of graphs

102	$f(x + a)$	Translate by vector $\binom{-a}{0}$ (Shift in the x-direction by –a)
103	$f(x - a)$	Translate by vector $\binom{+a}{0}$ (Shift in the x-direction by + a)
104	$f(x) + a$	Translate by vector $\binom{0}{+a}$ (Shift in the y-direction by +a)
105	$f(x) - a$	Translate by vector $\binom{0}{-a}$ (Shift in the y-direction by -a)
106	$-f(x)$	Reflection in the x-axis
107	$f(-x)$	Reflection in the y-axis
108	$af(x)$	Shrink or stretch graph vertically by a factor of a. (Multiply y-coordinates of f(x) by a)
109	$f(ax)$	Shrink or stretch graph horizontally by a factor of a. (Divide x-coordinates f(x) by a)
110	Composite function	fg(x) – the succession of two functions
111	Inverse function	f(x)[-1] – the reverse of a function

Z) Averages

118	Mean	Add all the numbers and divide by how many there are
119	Median	Order the numbers from smallest to biggest and find the middle number
120	Mode	Most frequent
121	Range	Difference between the highest and lowest value
122	Mean from a frequency table	$\dfrac{Total\ Fx}{Total\ F}$
123	Mean from a grouped frequency table	1. Find the mid point of each group 2. $\dfrac{Total\ Fx}{Total\ F}$

AB) Probability

124	Probabilities of mutually exclusive events	Add up to 1
125	$P(A \cap B)$	Probability of A AND B
126	$P(A \cup B)$	Probability of A OR B
127	$P(A \mid B)$	Probability of A GIVEN B
128	$P(B \mid A)$	Probability of B GIVEN A
129	$P(B')$	Probability of NOT B
130	$P(A\ or\ B)$	$P(A) + P(B) - (PA\ and\ B)$
131	$P(A\ and\ B)$	$P(A|B)P(B)$
132	Set notation	$\{1, 2, 3\} \in A$

Oasis Academy Enfield

Orchestra

Spoken dialogue

Broadway

OPENING NIGHT

Song

Dance

Singing skills

- tuning, rhythm and timing
- following an accompaniment
- communicating the meaning of a song
- learning songs (music and lyrics)
- projection and placing of the voice
- interpreting lyrics
- phrasing
- musicality
- characterisation
- expression

Dance skills

- posture and alignment
- coordination and balance
- spatial awareness
- rhythm and timing
- learning choreography
- projection
- phrasing
- musicality
- characterisation

Acting skills

- movement skills – use of movement, gesture and facial expression to communicate meaning
- vocal skills – clarity of delivery, communicating meaning through words
- learning lines
- developing a character
- exploring relationships with other characters

Musicals set out to **entertain** with:

- catchy music in a popular style
- solo songs, duets, choruses and ensembles
- orchestra or band accompaniment
- spoken dialogue
- dance sequences, stage spectacles with impressive costumes
- all held together by the **plot**

Unit 11: Devising for Performance

Key Terminology	Definition
Devising	Creating a performance based on a stimulus using workshops and research to create your ideas.
Stimulus	A picture, item, article, or literature that is used as a baseline for your devised performance.
Improvisation	Creating a performance on the spot, using a stimulus, thought or skill as the starting point for your improvisation.
Still Image	Being frozen during a performance to highlight a key moment.
Thought Tracking	When a character states a thought or emotion out loud for only the audience to hear.
Movement	The physical way in which you perform to convey emotion and tell a story.

The 6 Steps to Devising a Performance:
1. Choose a stimulus
2. Workshop it
3. Research the stimulus
4. Come up with your aims and intentions
5. Plan your performance
6. Rehearse and improvise

Your Stimulus:
A newspaper article explaining the events of the London 2011 riots.

Assessment:
In groups of 2-6 devise a performance based on the stimulus and your on going research project.

Biology Topic 6: Inheritance, variation and evolution

1.Keywords

Mitosis	A type of cell division which create two identical daughter cells
Meiosis	A type of cell division the create 4 unique gametes
Gametes	Sex cells eg sperm + egg and pollen + ovum
Sexual reproduction	Reproduction involving the fusion of gametes. Make unique offspring that resemble both parents
Asexual reproduction	Reproduction involving only one parent. No gametes fuse. Offspring are identical to parent
DNA	Deoxyribose nucleic acid. Polymer made of 2 strands forming a double helix. Contains the instructions for an organism.
Chromosomes	Long strands of DNA found in the nucleus. Humans have 23 pairs
Gene	A section of DNA which codes for a protein
Genome	All the genes of an organism

2. Meiosis

1. DNA replication: chromosome number doubles

2. Cell divides: two cells now

3. Those cells divide: four gametes now with half the number of chromosomes

3. Advantages of reproduction (TRIPLE ONLY)

Advantages sexual	Advantages asexual
Causes variation	Only need 1 parent
If environment changes natural selection can occur	Energy and time efficient (fast)
Humans can selectively breed organisms for beneficial characteristics	Lots of offspring can be produced when conditions are good
Organisms that can use both	• Malaria • Fungi • Plants

4. DNA structure (TRIPLE ONLY)

Nucleotide	The monomer of DNA. Consists of a sugar, phosphate and a base
Base	One of 4 different chemicals that make the triplet code. A G T C
Triplet code	3 bases in a row give a code for a specific amino acid

5. Protein synthesis and gene expression (HT TRIPLE ONLY)

Pairing of nucleotide bases	A $\rightarrow$ T T$\rightarrow$A G $\rightarrow$ C C$\rightarrow$G
Transcription	When the DNA is read and converted into messenger RNA (mRNA)
Translation	When the mRNA is read by ribosomes and use to build the amino acid sequence
Transfer RNA (tRNA)	Carries the correct amino acid to the ribosome for the mRNA triplet code
Coding DNA	DNA which codes for a protein, a gene
Non-coding DNA	DNA which does not code for a protein. Can be involved in turning on or off genes.
Mutation	A change to the DNA sequence. Most are harmless but some can stop proteins working correctly

6. Genetic inheritance

Allele	Different forms of the same gene. eg hair colour
Dominant	When only one copy of the allele is needed to show in the offspring
Recessive	When the allele only shows when there are two copies
Homozygous	Two copies of the same allele
Heterozygous	Two different alleles
Genotype	The set of genes in our DNA
Phenotype	The outward appearance a set of genes displays

7. Inherited disorders

Inherited disorders	Disorders that are caused by inheriting faulty genes from parents
Polydactyly	A dominant inherited disorder which causes extra fingers or toes to form
Cystic fibrosis	A recessive inherited disorder which causes sticky mucus to block air ways

8. Sex determination

No of chromosomes in a human	23 pairs (22 normal, 1 pair of sex)
Male	XY (50% chance)
Female	XX (50% chance)
Sperm	Can hold Y or X chromosome so determine gender of embryo

9. Variation

Variation	Changes within a population. Caused by mutation
Genetic variation	Changes due to inheriting different alleles of genes
Environmental variation	Changes due to the effect the environment has

10. Evolution

Evolution	The change in the inherited characteristics of a population due to natural selection. May result in a new species
Natural selection	The process where the organism best adapted to the environment survives and passes on their characteristics
Species	A group of organisms with similar features which can breed to make fertile offspring

Stages of evolution

1. Population shows variation due to their genes

2. Environment changes

3. Some individuals are best adapted and live longer

4. These can breed and produce more offspring

5. Over a long period of time the offspring dominate the population

11. Selective breeding

Selective breeding	The ancient practice of artificially selecting animals and plants to breed together to create certain characteristics
Inbreeding	The consequence of too much selective breeding. Can lead to disease or defects
Outcomes of selective breeding	• Disease resistance in crops • Increased meat and milk production • Domestication of pets • Large unusual flowers

12. Genetic engineering

Genetic engineering	The process of changing the genome by adding a desirable gene from another organism
GM crops	Genetically modified crops that are resistant to disease or grow bigger crops. Controversial to some

13. Process of genetic engineering (HT ONLY)

1	DNA containing desired gene removed from cell
2	Enzyme cuts out gene
3	Plasmid taken from bacteria
4	Plasmid cut by same enzyme
5	Plasmid and human gene joined by an enzyme

Human cell   Bacterium cell

Nucleus

1

2

3

4

5

Bacteria reproduce rapidly. This creates bacteria with the new characteristic
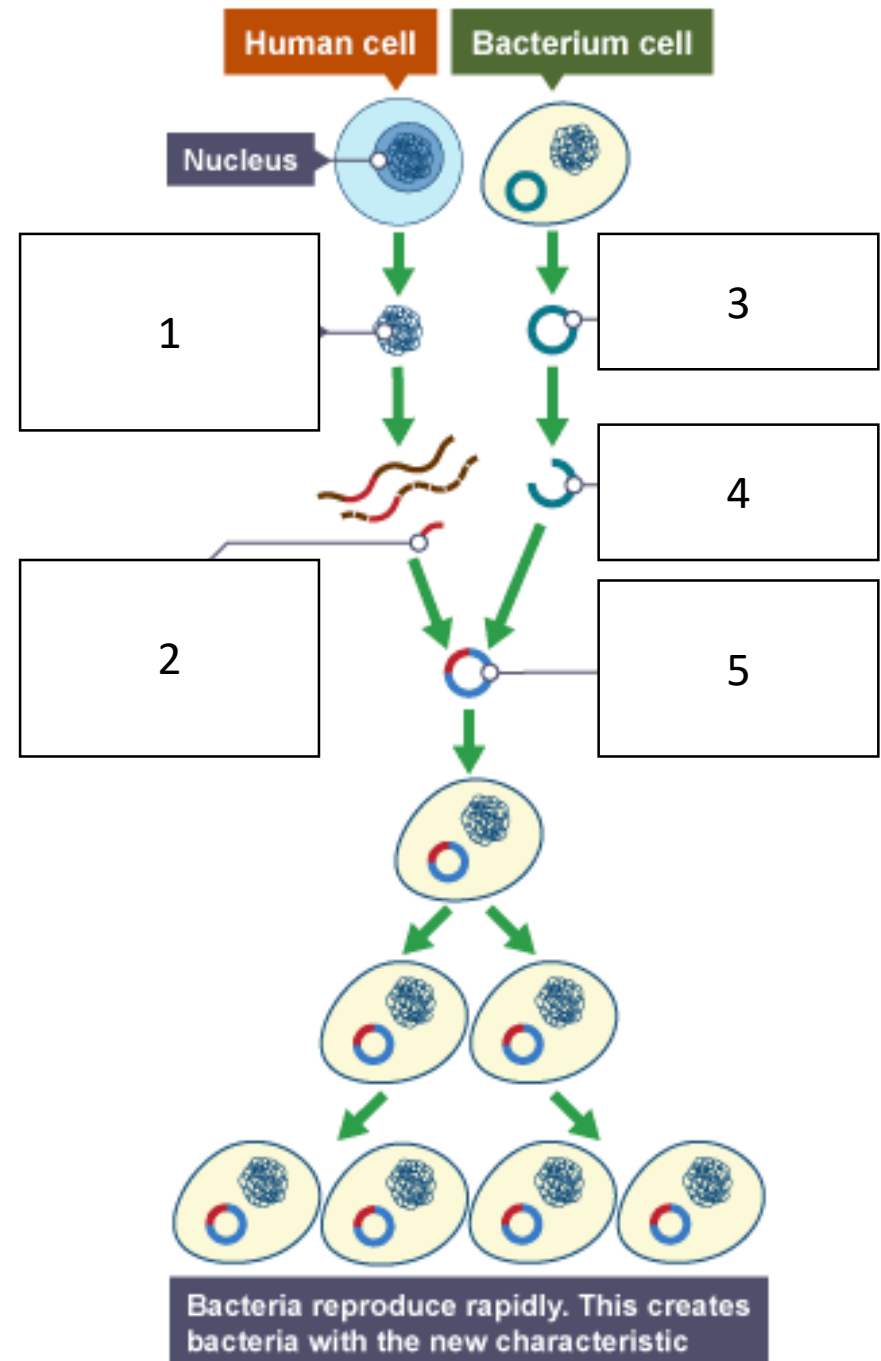
14. Cloning (TRIPLE ONLY)	
Tissue cloning	Using groups of cells from a plant to grow a identical new plants
Cuttings	Old fashioned simple method of growing a new plant from part of an old plant
Embryo transplant	Splitting apart unspecialised animal cells from an embryo and transplanting them into host mother
Adult cell cloning	
1	Body cell taken from Sheep A
2	DNA removed
3	Egg taken from Sheep B
4	Nucleus removed
5	DNA and cell fused with electric shock
6	Cell develops into embryo and implanted into surrogate (c)

Female A

Female B

1

3

2

4

5

6

Lamb is clone of Sheep A

C   A
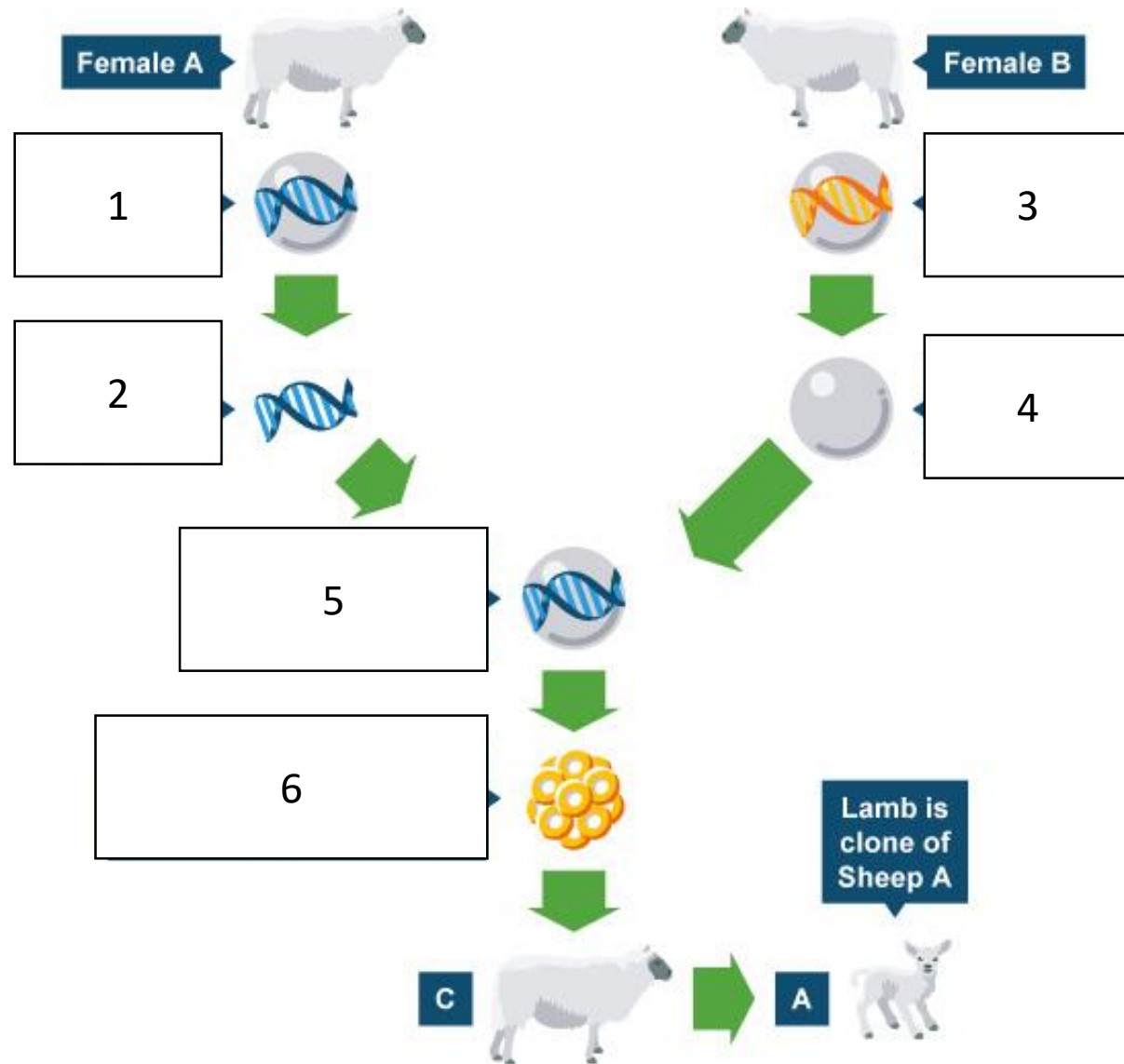
15. Theory of evolution (TRIPLE ONLY)

Charles Darwin	Proposed the theory of evolution in his book 'on the origins of species'
Darwin's theory took a long time to be accepted because:	• It challenged the idea that God made all creatures • There was not enough evidence at the time • Mechanism of inheritance was not understood for another 50 years.
Jean-Baptiste Lamarck	Had a different theory about inherited characteristics. He believed they were acquired through the life of the parents. He was wrong
Alfred Russell Wallace	Independently came up with the idea of evolution and natural selection at the same time as Darwin. Worked on the idea of speciation
Speciation	Formation of a new species as a result of evolution

16. Understanding genetics (TRIPLE ONLY)

Mid 19th century	Gregor Mendel a monk who carried out breeding experiments on plants. Discovered the inheritance of characteristics as 'units'
Late 19th century	Chromosomes observed
Early 20th century	Chromosomes linked to inheritance. Genes discovered.
Mid 20th century	Structure of DNA discovered and the way genes code for proteins.
Today	Antibiotic resistance provides real time evidence of evolution in action

17. Fossils

Fossil	Remains of a plant or animal that were alive millions of years ago. Found in rocks. Normally only the hard parts
Fossil formation	• Parts of organisms that have not decayed because one or more of the conditions needed for decay are absent • Parts of the organism are replaced by minerals as they decay • Preserved traces of organisms, such as footprints
What they tell us	Early life was simple As the fossils get newer the life becomes more complex
Why do we not have a fossil for every living thing	• Early life forms were soft bodied so not fossils formed • Geological activity destroyed fossils

18. Extinction

Extinction	When an entire species has died
Causes of extinction	1. Disease 2. New predators 3. Famine 4. Natural disaster (meteor, volcano)

19. Resistant bacteria

MRSA	A type of bacteria that has evolved to be resistant to antibiotics
How to prevent antibiotic resistance	1. Not prescribing antibiotic for viral and non-threatening infections 2. Completing the course of antibiotic given 3. Restricting the use of agricultural antibiotics

20. Classification of organisms

Carl Linnaeus	Invented the groups we classify organisms into 1.　Kingdom 2.　Phylum 3.　Class 4.　Order 5.　Family 6.　Genus 7.　Species
Binomial name	The official name of all organism consisting of genus and species
3 domain system	
Archaea	Primitive bacteria normally found in extreme environments
Bacteria	True bacteria
Eukaryotes	Plants, animals, fungi and protists

Mnemonic Device

Kingdom	• King
Phylum	• Phillip
Class	• Came
Order	• Over
Family	• For
Genus	• Good
species	• Soup

Chemistry Topic 9: Chemistry of the atmosphere

1. Composition of the earths atmosphere now

79%	Nitrogen
20%	Oxygen
1%	Other gases including CO_2

2. Evolution of the atmosphere

Time	Atmosphere	reason
4 billion years a go	Nitrogen, Carbon dioxide and water vapour (like mars)	Volcanic eruptions
	Nitrogen, Carbon dioxide decreases	Earth cools and water vapour condenses. Carbon dioxide dissolves into the oceans
2.7 billion years ago	Increasing oxygen decreasing carbon dioxide	Photosynthesising organisms evolved
	Reducing oxygen to modern levels	Animals evolved and began respiring the oxygen

3. Climate change

Greenhouse gases	Gases which increase the temperature of the atmosphere Eg Carbon dioxide, methane, water vapour
Greenhouse effect	When excess greenhouse gases absorb and radiate IR radiation back to the earth warming it
Man-made climate change	The leading theory that human activities are causing an increase in global temperature
Carbon footprint	Total amount of carbon dioxide emitted over the life of a product, service or event
Global dimming	Particulates block the light from the sun slightly, reducing global temperature
Acid rain	Gases dissolve in rain causing damage to buildings, statues, lakes and trees

4. Atmospheric pollutants from combustion

Pollutant	Source	Effect
Carbon dioxide	All combustion	Global warming
Carbon monoxide	Incomplete combustion	Toxic, breathing problems
Carbon particle (Soot)	Incomplete combustion	Breathing problems, global dimming
Sulfur dioxide	Burning sulphur, impurities in fossil fuels	Acid rain
Oxides of nitrogen	Vehicle engines	Acid rain

Physics topic 6: Waves
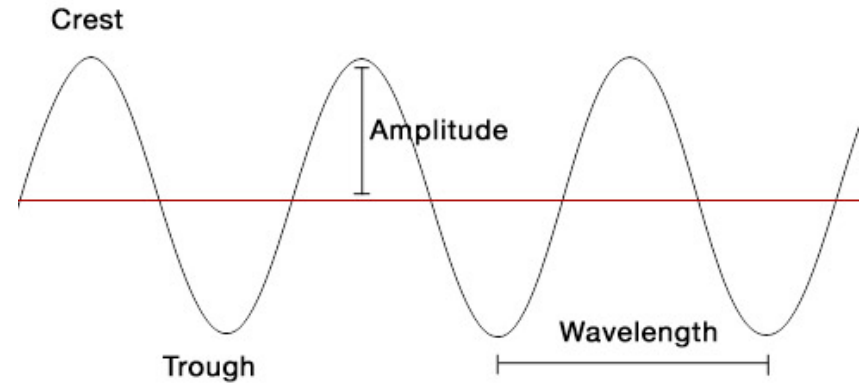
1. Keywords

Transverse wave	A wave where the vibration is perpendicular to the direction of travel
Longitudinal wave	A wave where the vibrations are parallel to the direction of travel
Mechanical wave	A vibration that travels through a substance (e.g. sound)
Frequency	The number of wave fronts passing a fixed point every second (measured in Hz)
Period	The time for one complete wave
Ultrasound	Sound above 20,000Hz
Superposition	When two waves meet and affect each other
Reflection	When waves bounce off a surface
Echo	Reflection of sound that can be heard

2. Period and frequency

$$T = \frac{1}{f}$$

T	Period (s)
f	Frequency (Hz)

3. Comparing types of wave
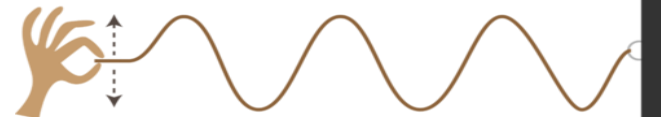
Comparing waves:	Light wave	Mechanical wave
Type of wave	Transverse	Longitudinal
Can they travel through a vacuum?	Yes	No. Mechanical waves can only pass through a solid, liquid or gas
Can they be reflected?	Yes. By smooth shiny surfaces	Yes. By smooth surfaces
Can they be absorbed?	Yes. By dark surfaces	Yes. Rough surfaces absorb sound
Can superposition occur?	Yes	Yes

4. Wave equation

$$v = f\lambda$$

v	Wave speed (m/s)
f	Frequency (Hz)
λ	Wave length (m)

5. Uses of ultrasound (HT PHYSICS ONLY)

Use	How it works
Cleaning jewellery	The vibrations of the wave shake the dirt lose
Scanning the human body	The waves are partially reflected at different tissue boundaries
Industrial imaging	The waves can detect flaws in metal castings as they are partially reflected by cracks
Physiotherapy	Energy from the wave is absorbed by body tissue and relieves pain

6. Seismic waves produced by earthquakes (HT PHYSICS ONLY)

1	S waves	Transverse	Only travel through solid
2	P waves	Longitudinal	Travel through the earth and are refracted when they pass through different density medium
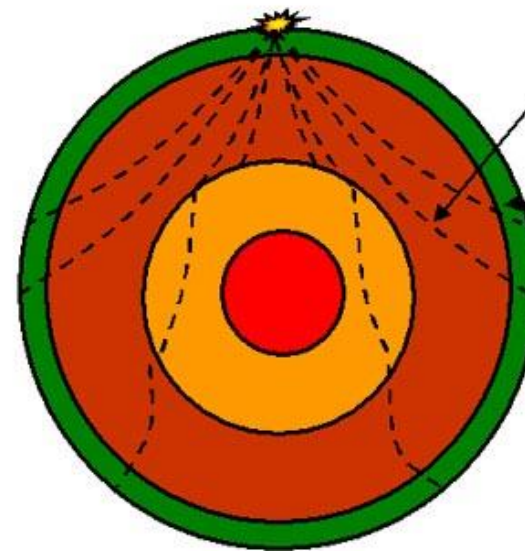
1

2

The paths of these waves are curved because density is gradually changing

7. The electromagnetic spectrum

Low Frequency   High Frequency

10^0 10^2 10^4 10^6 10^8 10^{10} 10^{12} 10^{14} 10^{16} 10^{18} 10^{20} 10^{22} 10^{24}

| 1 | | 2 | 3 | | 5 | 6 | | 7 | |

10^8 10^6 10^4 10^2 10^0 10^{-2} 10^{-4} 10^{-5} 10^{-8} 10^{-10} 10^{-12} 10^{-14} 10^{-16}

Long Wavelength   Short Wavelength
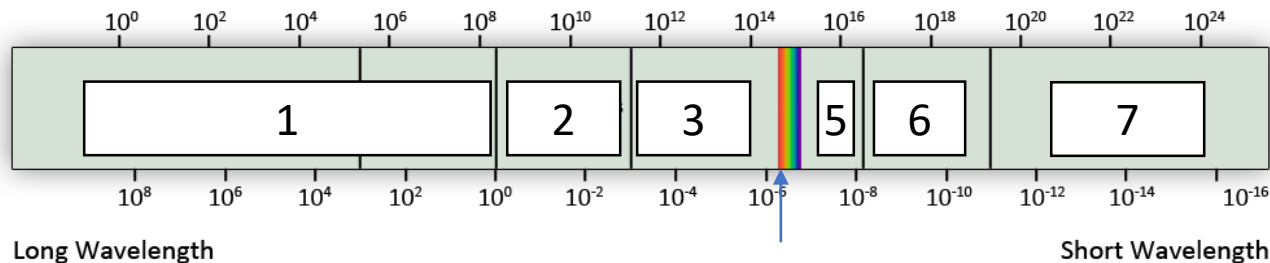
	Name	Notes
1	Radio	Produced by oscillations in circuits (HT)
2	Microwaves	
3	Infrared	Thermal energy
4	Visible	
5	Ultra violet	Skin damage
6	X rays	Cause cancer
7	Gamma rays	Cause cancer

8. The properties of EM waves on materials (HT ONLY)

1	Transmit
2	Specular Reflection
3	Diffuse Reflection
4	Absorb
5	Refract
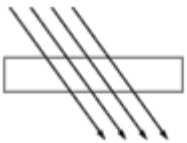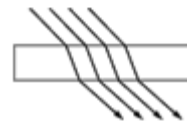
9. Uses of EM waves

Name	Use
Radio	Radio and TV
Microwaves	Satellite communication, cooking food
Infrared	Electric heaters, cooking food, infra-red cameras
Visible	Fibre optic communication
Ultra violet	Energy efficient lamps, sun tanning
X rays	Imaging bones
Gamma rays	Radiotherapy, medical imaging
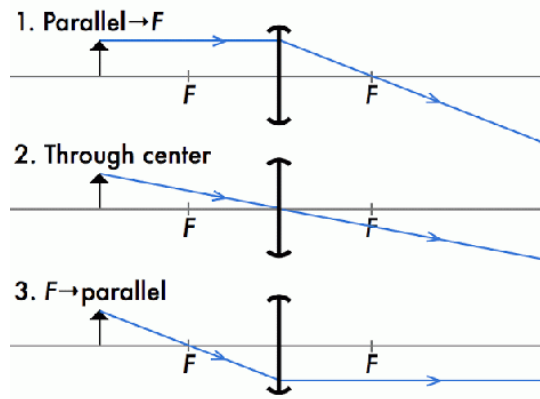
10. Lenses (physics only)

$$magnification = \frac{image\ height}{object\ height}$$

11. Black body radiation (physics only)

emit	give out
absorb	Take in
Black body	An object that absorbs all the radiation shone on it. It is the best possible emitter

12. Perfect black bodies and radiation

1	The intensity of black body radiation depends on temperature
2	The hotter the object the more radiation is emitted
3	The hotter the object the greater the increase in the proportion of shorter wavelengths
	White hot is hotter than red hot

Theme 2: Travel and Tourism

#	Spanish	English	#	Spanish	English
1	las vacaciones	holidays	18	a pie	on foot; walking
2	al extranjero; en el extranjero	abroad	19	la autopista	motorway
3	dónde	where	20	la carretera	highway
4	una excursion/un viaje	a trip	21	el conductor	driver
5	la comida/comer	food/to eat	22	la habitación	room
6	el plato	dish/food	23	el alojamiento	accommodation
7	la vuelta	change (money)	24	el albergue de jóvenes	youth hostel
8	viajar	to travel	25	estrella	star
9	en el campo	in the country(side)	26	la cama de matrimonio	double bed
10	al lado del mar	by the sea	27	el camping	campsite, camping
11	el avión	by plane	28	la pensión	boarding house, b&b
12	el vuelo	the flight	29	el parador	state-owned hotel
13	el autocar	coach	30	el empleado	employee
14	el coche	car	31	la insolación	sunstroke
15	el barco	boat	32	broncearse	to get a tan
16	el tranvía	tram	33	el esquí acuático	water skiing
17	el aeropuerto	airport	34	el vuelo	flight

	Theme 2: Travel and Tourism				
35	el río	river	52	Escocia [f]	Scotland
36	maleta	suitcase	53	Gales	Wales
37	volver	to return	54	Alemania [f]	Germany
38	estar de vacaciones	to be on holiday	55	España [f]	Spain
39	llegar	to arrive	56	Francia [f]	France
40	el país	country	57	Grecia [f]	Greece
41	la isla	island	58	los Estados Unidos	United States
42	la montaña	mountain	59	las Islas Canarias	Canary Islands
43	el ruido	noise	60	Europa [f]	Europe
44	antiguo/a	old	61	Londres	London
45	limpio/a	clean	62	el Mediterráneo	Mediterranean Sea
46	famoso/a	famous	63	el piragüismo	canoeing/kyaking
47	peligroso/a	dangerous	64	las ruinas	ruins
48	el aire acondicionado	air conditioning	65	el lugar	a place
49	recuerdo	souvenir	66	el parque temático	Theme park
50	Inglaterra [f]	England	67	el idioma	language
51	Irlanda [f]	Ireland	68	al lado de	next to/to the side of

	Travel and Tourism				
1	**Deniz kenarı**	seaside	18	**Otobüs**	bus
2	**Ada**	island	19	**Uçak**	plane
3	**Ziyaret**	visit	20	**Sandal**	boat
4	**Son**	to last	21	**Otobus**	coach
5	**Yurt dışı**	abroad	22	**Araba**	car
6	**Dönüş**	return	23	**Motosiklet**	motor bike
7	**Geri dönmek**	to come back	24	**Uçuş**	to fly
8	**Kalmak**	to stay	25	**Dağ**	mountain
9	**Yerleşim yeri**	accommodation	26	**Deniz kenarı**	beach
10	**Havaalanı**	airport	27	**Kum**	sand
11	**Uçuş**	the flight	28	**Nehir**	river
12	**Geç**	late	29	**Göl**	lake
13	**Kiralık araba**	car rental	30	**Dünya**	world
14	**Kiralamak**	to hire	31	**Açık hava**	in the open air
15	**Kilima**	air-con	32	**Afrika**	Africa
16	**Otel**	Hotel	33	**cezayir**	Algeria
17	**Koltuk**	a seat	34	**Almanya**	Germany

	Travel and Tourism				
35	ingiltere	England	51	Yelken	sailing
36	Belçika	Belgium	52	Beğenirim	I like it
37	çin	China	53	Beğendim	I liked it
38	işkoçya	Scotland	54	Hava durumu	the weather
39	ispanya	Spain	55	sıçaktı	It was hot
40	amerika	USA	56	soğuktu	It was cold
41	büyük britanya	Great Britain	57	Yağmur yağdı	It rained
42	fas	Morocco	58	sıçaktı	Il was sunny
43	galler	Wales	59	meşur	famous
44	İsviçe	Switzerland	60	Ülke	a country
45	Tunus	Tunisia	61	kasaba	town
46	Türkiye	Turkey	62	Köy	Vıllage
47	Londra	London	63	aux	in/to (plural countries)
48	Kıbrıs	Cyprus			
49	Akdeniz ülkesi	Mediterranean			
50	britannique	British			