Year 10 Knowledge Organiser
Term 1

This booklet contains some of the key content we want the students to learn this term. Knowledge Organisers are placed in the relevant Google Classroom.

How students and parents can use a Knowledge Organiser to maximise learning:

- Pick a subject to recall and memorise
- **Look** at the pages for that subject
- **Read** the page information for that subject
- **Cover** the page of information
- **Write** the information for that subject from memory
- **Check** what you have written. Correct mistakes and add anything you have missed
- Your teacher will **quiz** you in class to see what you can recall
- **Repeat** the process over time and focus on the information you keep missing or make mistakes on

GLC Gateway Academy
All Different: All Equal: Together, Improving Upon Our Best

GLC All Different: All Equal
Together, Improving Upon Our Best

Contents

GLC Gateway Academy
All Different: All Equal: Together, Improving Upon Our Best

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Art

Year 10 – Movement Project

Overview of Topic

In this project you will investigate the theme of Movement through different media's such as photography, creating a 3D wire sculpture and producing a ceramics final piece. All students will work on Black boards throughout this project developing your presentation skills, written analysis and art work. We will explore a range of movement throughout this project beginning with drawing to music.

BOARD 1

Drawing to Music

Step 1:
We will listen to a variety of songs and draw what we feel the music would like in a drawing.

Step 2:
You will then work back over your lines giving it more detail whilst listening back through the songs.

Step 3:
After this you will use the resources available to you to analyse the work that you have produced.

Step 4:
To present your work on your black board. Title 'Drawing to Music' in large, using a stencil. Stick down your 4 pieces of art ensuring they have a clear and equal border. Using a pencil draw writing lines to then copy your analysis onto your board. Use a white pen to write your analysis.
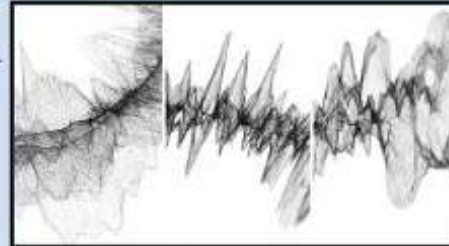
Tonal Ladder
All tonal shades from dark to light should be present in your drawing.

BOARD 2

Artist Research: Michael Bosanko

Step 1:
We will look at Michael Bosanko's artwork. You will select 5-8 high quality images - No blurry photos.
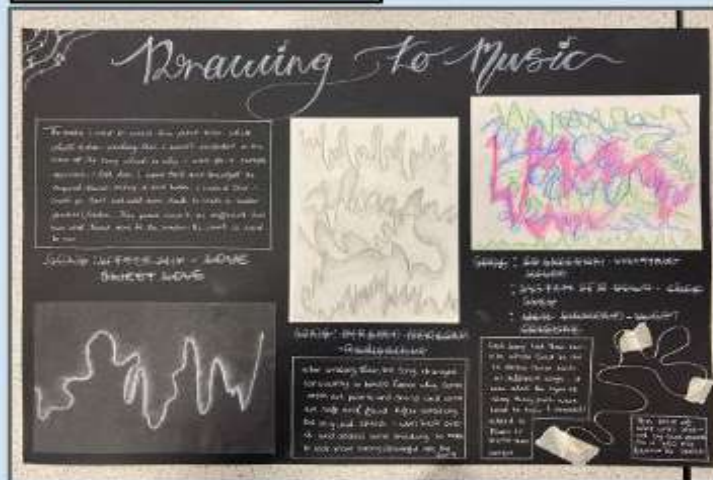
Step 2:
You will then use the resources available to you to analyse his work as well as find out some background information on him.

Step 3:
To present your work on your black board. Title 'Michael Bosanko' in large, using a stencil. Stick down the artists work ensuring they have a clear and equal border. Using a pencil draw writing lines to then copy your analysis onto your board. Use a white pen to write your analysis.

Exemplar work: Grade 7/8

BOARD 3

Drawing with Light

Step 1:
Set a camera up to the correct settings, place it onto a tripod and enter a dark room. Experiment with different lights, swirls and representations of movement.

Step 2:
Choose your favourite 7-10 images. Print a variety of sizes off. Trim using the rotatrimmer.

Step 3:
To present your work on your black board. Title 'Drawing with Light' in large, using a stencil. Stick down your photographs ensuring they have a clear and equal border. Using a pencil draw writing lines to then copy your analysis onto your board. Use a white pen to write your analysis.

Correct settings:
Camera = Manual
Lens = Manual
ISO = 100
F-Stop = F16-F22
Shutter Speed = 8"-30"

Challenge - higher grades
To create an A4 recreation of his work experimenting with different materials.

Art

Year 10 – Movement Project

Assessment Objectives:
AO1 – Developing ideas through research
AO2 – Using resources, experimenting with different media and ideas
AO3 – Recording ideas (photos & drawings)
AO4 – Personal response

Overview of Topic

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BOARD 4 Artist Research: Georgia O'Keeffe or Yinka Shoniabare

Step 1:
We will look at Michael Bosanko's artwork. You will select 5-8 high quality images
- No blurry photos.

Step 2:
You will then use the resources available to you to analyse his work as well as find out some background information on him.

Step 3:
To present your work on your black board. Title 'Michael Bosanko' in large, using a stencil. Stick down the artists work ensuring they have a clear and equal border. Using a pencil draw writing lines to then copy your analysis onto your board. Use a white pen to write your analysis.

BOARD **3D Wire Sculpture**

Step 1:
We will create a wire sculpture using a block of wood, wire, tights and paints.

Step 2:
You will then coat your sculpture with white paint as a base coat then design your piece in the style of your chosen artist. Tip - write down the process briefly so that you can add it to your board.

Step 3:
To present your work on your black board. Title '3D Wire Sculpture' in large, using a stencil. Stick down images of the process ensuring they have a clear and equal border. Using a pencil draw writing lines to then copy your analysis onto your board. Use a white pen to write your analysis.

BOARD 6 **Mood Board**

Step 1:
Take primary images showing movement. Relate to something that you can potentially create using clay. Find secondary images of the same subject. Print off the images.

Step 2:
To present your work on your black board. Title 'Mood Board' in large, using a stencil. Stick down your photographs ensuring they have a clear and equal border. No analysis needed - only label your primary and secondary images.
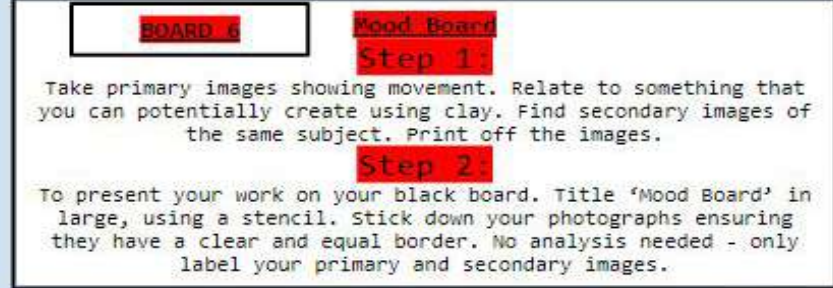
Art

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BOARD 7 — Development for a final piece

Step 1:
You will create 3 different ceramics ideas that show movement. All 3 ideas must have different angles drawn out.

Step 2:
You will further develop your most successful explaining why it is the most successful piece and how you plan to create it.

Step 3:
To present your work on your white board. Title 'Development for my ceramics piece' in large, using a stencil. Using a pencil draw writing lines to then write out your analysis onto your board.
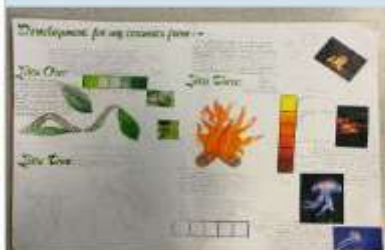
BOARD 8 — Ceramics Final Piece

Step 1:
Create your ceramics final piece. Take photographs throughout the process.

Step 2:
Print out images taken of the process.

Step 3:
To present your work on your black board. Title '3D Wire Sculpture' in large, using a stencil. Stick down images of the process ensuring they have a clear and equal border. Using a pencil draw writing lines to then copy your analysis onto your board. Use a white pen to write your analysis.

4 S's:
SCORE it
SLIP it
STICK it
SMOOTH it

Clay Techniques:
Scoring –

twinkl.com

Slip –

DON'T SKIP THE SLIP!

TeachKidsArt.net

Scoring and slipping:
To join together two pieces of clay they must be **scored** and **slipped**. Scoring is done by scratching texture (similar to hashtags: #) into the surfaces that you wish to join. **Slip** is a liquid mixture of clay and water that is used to help weld the pieces together. Without the slip the clay will not stick.

Final Evaluation
To write an A4 page evaluation of your movement project - using the resources to support you.

Business Studies

Key Vocabulary

Aims – a long term goal a business wants to achieve

Objectives – more specific measurable steps (SMART)

Financial aims – goals related to money, e.g. survival, profit levels

Non-financial aims – goals related to non-monetary aspects, e.g. ethical or environmental issues

Survival – having enough sales to cover costs and still be trading

Profit – when revenue is greater than costs

Sales volume – the number of products sold

Market Share – the percentage of total sales that one business has

Ethical – morally correct

Shareholder – an individual who owns part (a share) of company

Dividend – the percentage of profit that is paid to shareholders of a company each year

Core Knowledge

SMART – **S**pecific, **M**easurable, **A**chievable, **R**ealistic, **T**ime-framed

Examples of Aims:

- **Financial** aims:
  - Survival
  - Maximise or increase sales and/or profit
  - Grow sales and/or profit
  - Increase dividends to shareholders

- **Non-financial** aims:
  - Ethical, e.g. no animal testing
  - Achieve customer satisfaction
  - Achieve a personal challenge
  - Independence
  - Help others – Jamie Oliver's 15 restaurant (training youngsters)

Don't be a "man on the street"

- All businesses aim to make a profit – not true! Social objectives can be important and so can personal obje
- Businesses will change their objectives over time – don't as that they always are aiming for the same thing

Wider Business World

Tesco – used to aim to have more than 50% of its revenue from non-food. Changed after Aldi and Lidl gained 10% market share between them

M&S – aims are about environment and sustainability not profit

Dyson – James Dyson had a personal objective: to be successful rather than profitable

Synoptic Links

Enterprise – the non-financial rewards for entrepreneurs are similar to non-financial objectives

Financial data – understanding the difference between survival (break-even) and profit

Ownership – only companies will have shareholders; smaller businesses are more likely to have personal objectives

Business Studies

Topic 1.3.2a Revenue, Costs and Profit

Key Vocabulary

Revenue – Also called **Turnover**, **Income** and **Sales**. This is the money generated from selling your products

Demand – a business term for the quantity of products sold

Fixed costs – costs that do not change as the level of production changes. They must be paid even if output/sales are zero, e.g., rent, rates

Variable costs – costs that change in direct relation to the amount sold or produced by a business, e.g., raw materials, packaging

Total costs – All costs added together

Profit – when revenue is greater than costs

Loss – when revenue is lower than costs

Interest – a percentage charge on borrowed money / percentage reward for saving money

Core Knowledge

Fixed costs	Variable costs
Rent	Raw materials
Rates	Packaging
Electricity / heating / phone bills	Delivery costs
Salaries	
Insurance	

Revenue = Number of items sold x Selling price per unit

Total Variable cost = variable cost per item x number sold

Total costs = Total variable cost + fixed costs

Profit = Revenue – Total costs

Interest charged = amount borrowed x (interest rate ÷ 100)

Total amount repaid = amount borrowed + interest charged

Monthly payments = Total amount repaid ÷ (years of loan x 12)

% Interest charged = (total repayment – borrowed amount) ÷ borrowed amount x 100

Don't be a "man on the street"

- Interest is not about how much people like your product!
- Revenue and profit are VERY different
- Loans are not paid at the end of the term – they are paid in instalments each month
- Borrowing money is debt. Debt is *not* a bad thing unless, the business can not pay it back

Wider Business World

Amazon – has no high street retailers so has fixed costs than a lot of other businesses

Bank of England – sets the base rate for interest that other lenders then use

Linked Topics

External factors – changing interest rates can have an impact on consumer spending

Breakeven – when total costs are exactly the same as total revenue

Cash flow – unpredictable or inconstant revenue can impact on cash flow

Sources of finance – interest is charged on borrowing

Business Studies

Key Vocabulary

Breakeven point – when total revenue = total costs (the business is not making a profit or a loss)

Breakeven output – the number of products needed to break-even

Margin of safety – number of products produced above breakeven. The higher the margin of safety the better.

Revenue – Also called **Turnover, Income** and **Sales**. This is the money generated from selling your products

Output – quantity of products made

Fixed costs – costs that do not change as the level of production changes. They must be paid even if output/sales are zero, e.g., rent, rates

Variable costs – costs that change in direct relation to the amount sold or produced by a business, e.g., raw materials, packaging
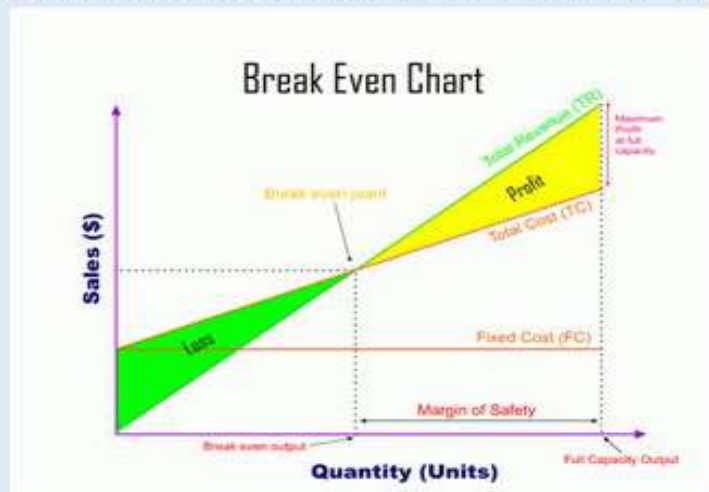
Total costs – All costs added together

Profit – when revenue is greater than costs

Loss – when revenue is lower than costs

Core Knowledge

Calculating breakeven allows a business to use all its costs to calculate how many products it must sell to cover ALL costs.

Break Even Chart

The contribution method is a quicker, more accurate way to calculate breakeven:

Break-even = Fixed costs ÷ (Selling price – variable cost) ☐

Contribution = Selling price – variable costs ☐

Margin of safety= Actual units – Break-even units ☐

Reducing break-even

- This can be done by reducing costs, for example new suppliers or reducing the number of workers. However, quality my drop losing customers, or poor customer service may lose sales.
- This can also be done by increasing prices. But increasing prices may lose sales, especially from price sensitive customers!

Wider Business World

Gordon Ramsey – watch any of his 'Nightmare' shows to see how he talks about knowing the break-even number of meals, and the importance of costing each meal

High street retailers – consider the impact of COVID19 on the breakeven point of most retailers: what were their costs and revenue during this period

Synoptic Links

Costs – knowing the difference between fixed and variable costs and being able to calculate costs and revenue

Aims – breakeven (survival) is an aim for a start-up business, or one in a struggling market

Business plans – this information is needed in the plan to present to investors

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GCSE Business Studies	Topic 1.3.3 Cash flow

What is:

The difference between cash and profit is:

A business can receive lots of cash but it doesn't mean its profit. If the costs are more than the cash received the business is likely to be making a loss

If the business does not have enough cash it can:

Source finance – such as:

Overdraft – spending more money than is in the account

Bank loan – borrow money from the bank for longer than one year but will have to pay interest on it

Share capital – sell shares to investors in return for cash

Sell assets of the business

What is insolvency?

When a business lacks the cash to pay its debts

Core Knowledge

Cash is important because:

- It enables a business to purchase stock
- It enables a business to pay its staff
- It enables a business to pay its bills
- It enables a business to research & develop new products

Cash inflows – money entering the bank account or business

Cash inflows come from:

- Sales of stock
- Sale of unused equipment such as a property or vehicle
- Dividends or interest received
- Bank loan received
- Sale of shares

Cash outflows – money leaving the bank account or business

Cash outflows go on:

- Paying wages
- Paying for stock
- Paying the bills
- Paying back loans

Opening balance – the amount of money at the start of the month, or last month's closing

Net cash flow – inflows minus outflows

Other words for inflows and outflows are receipts and payments

Closing balance – the amount of money at the end of the month, Opening balance ADD net cash flow

How can a business improve its cash inflow?

Increase its sales/revenue

- By advertising
- Reducing prices

By de-stocking – having a sale to get rid of all the old stock

Get customers who have credit to pay sooner

Have an injection of long-term cash – such as a bank loan or sell more shares

How can a business reduce its cash outflow?

Find cheaper suppliers

Rent/lease rather than buy

Take longer paying the bills that you have (cash stays in your bank account longer earning interest)

Core Knowledge

A business will need finance at three key times:
- At start-up to help fund start-up costs, e.g. initial stock
- During periods of expansion to fund new buildings, legal costs, etc
- During periods when cash flow is poor

	Description	Short or Long Term	Internal or External	Benefits	Drawbacks
Overdraft	Facility which enables a business to use more money than is in their bank account	Short	External	Available if needed	High interest rate if used
Trade Credit	Supplier allows a customer 30 days to pay their bill	Short	External	Free Helps cash flow by paying later	No further credit if bill not paid – meaning no further stock
Personal savings	Cash an individual has saved or received from presents	Long	Internal	No interest to pay	Might not be large sums of money
Retained profits	Profit kept from previous years, accumulated after paying tax and dividends	Long	Internal	No interest to pay	New businesses, or loss-making businesses, don't have any
Venture capital	Share and loan capital providing by an investor willing to take a risk. For example, Dragons Den	Long	External	Advice and support provided by venture capitalist	Investors want large slice of the business
Share capital	Capital raised from the selling of shares to investors. Buyers of shares are shareholders	Long	External	Can raise large sums of capital	Loss of control Have to pay dividends
Bank Loan	Cash borrowed from a bank. Paid back monthly over a period of years	Long	External	Can raise large sums of cash Pay back in small amounts	Takes time to arrange Interest has to be paid
Crowdfunding	Raising capital online from lots of small investors after pitching the business idea, e.g. Go Fund Me	Long	External	Wide range of investors – via internet	Amount required may not be met

Key Vocabulary

Interest – the charge on borrowing money ☐

Dividends – the part of the profit that is paid to shareholders as a reward for their investment ☐

Mortgage – a type of loan that is secured on property. Interest can be fixed or variable ☐

Don't be a "man on the street"

- Being in debt is not a bad thing and won't always lead to business failure
- Many businesses borrow to finance growth
- You pay back loans and mortgages each month, not at the end of the time period

Synoptic Links

Interest – calculating and understanding the interest rate will help to understand which sources are cheaper

External factors – influences on businesses include the interest rates

Ownership – remember that only Ltd's can sell shares

Costs & breakeven – interest and loan payments are fixed costs

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Intellectual Development

What is the definition of Intellectual Development?

"Growth of a child's ability to think"

Key words:	What it means:	Definition:
Intellectual development	The development of the brain	Known as cognitive development; including language, reading and writing, communication and number skills.
Communication	How the child socialises	Using listening and thinking skills to understand what to say in order for the child to get what they want.
Literacy	Reading, writing and language skills	The ability to read and write and use language skills.
Numeracy	Mathematics/Maths	The ability to recognise, understand and use numbers.

What are the 3 main categories for intellectual development?

Numeracy Skills

What does the term 'numeracy skills' refer to?
This is linked to problem solving and reasoning and is known as number skills.

What examples of numeracy skills can you recall?
- Speaking and using numbers e.g. there are 2 apples
- Counting – including mathematical number squares
- Recognising numbers e.g. 1,2,3 etc
- Using mathematical ideas e.g. size, shapes, mass
- Recognising and drawing shapes e.g. triangles
- Recognising and making patterns e.g. odd and even numbers, sequencing
- Using the correct vocabulary e.g. adding and taking away
- Simple calculations e.g. 2+2

Communication Skills

Describe the term communication:
Children use communication through observing and copying what they hear/see.

What are the six examples of communication?
1) **Body language** – expressing feelings through the position of their body
2) **Listening** - being able to hear and understand what is being said
3) **Verbal** – building on the vocabulary that they hear
4) **Gestures** – pointing to things that children want
5) **Sign language** – children with hearing impairments may use sign language
6) **Reading and writing** – using the written form to communicate

Explain what each example means:

Literacy Skills

Literacy is the ability to read and write.

How are literacy skills developed?
- Reading and writing

When should you begin to develop reading skills?
Developing a love of books with a child will help with this skill. This can be developed from an early age and can be encouraged through reading books to a child from birth. This will help them to develop their speech and language skills.

Language

Language is used to communicate as children listen and understand what they want to say. They use their thinking skills in order to get their message across.
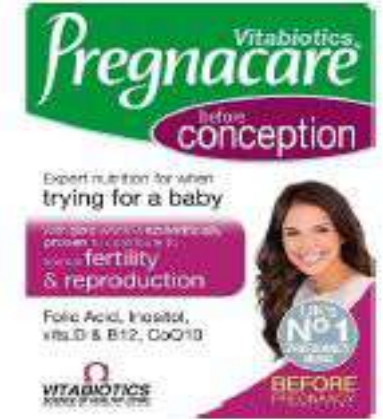
What 3 factors improve a child's literacy skills?

Child Development

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Types of Play

Key words:	What it means:	Definition
Solitary Play	Playing alone	Also known as independent play, is one of the earliest stages of play where children play alone because they have not developed socially to be able to play with others.
Parallel Play	Playing along-side others	Children playing side by side, but not interacting with each other to continue their play.
Associative play	Interested in the same activity as another but not playing with them	This is the development of social play. It is generally the first stage where social interaction is required in children's play as they engage in a mutual activity, though not working toward a common goal.
Co-operative play	Playing with someone else	Cooperative play focuses on children working together to achieve a common goal, such as building a play structure, putting together a puzzle, or engaging in dramatic play. **It has been described as the stage where children play in a group.**

Type	What is it?	What are the examples of each type of play?
Manipulative Play	This involves children using their hands, (fine motor skills) for example to move, turn or screw things to make them fit.	- Puzzles - Mark making (drawing/ painting/ writing) - Shape sorters - Threading beads - Craft activities - Construction toys
Co-operative play:	Play which takes account of others actions within their play together; sharing, group play e.g. shop keepers and customers, or games that have rules to follow.	- Board games - Circle games (here we go round the mulberry bush/ the farmers in his den) - Playground games (what's the time Mr Wolf?) - Imaginary role play (dressing up/ toys/ teddies/ tea sets) - Imaginary play with small world toys (cars/ farm set/ dolls house)
Solitary play:	Where the child plays alone, in their own space, exploring and experimenting with objects.	- Imaginary play (role play/ small world play) - Puzzles - Books - Video/ computer games
Physical play:	Play that involves gross motor skills, the muscles and moving around, such as football or a climbing frame	- Ball games - Running/ jumping/skipping/ hopping/ crawling etc. - Playground equipment (slides/ swings) - Ride- on- toys and bikes - Push and pull toys - Dancing
Creative play:	Where children experiment with materials, collage, painting, music, imagination.	* Music and dance - Mark making (painting/ drawing/ writing) - Making models - Sand and water play - Stories - Imaginary play

J809 – Cambridge Nationals Level 1/2 Child Development
R057 – Health and Wellbeing for Child Development
TA1: Pre-conception health and reproduction

Child Development

	1.1. Factors affecting pre-conception health for women and men
	Factors that affect the decision to have children
	– Relationship between partners – Finance – Parental age – Per pressure/social expectations – Genetic counselling for hereditary disease
	Factors that can contribute to infertility problems
Weight	Women – Being overweight can affect ovulation, which can in turn affect fertility and make it harder to conceive. Being underweight can affect periods and ovulation, which can both affect fertility and make it harder to conceive. Men – Being overweight may affect the quality and quantity of sperm. Being underweight can also reduce a man's sperm quality and therefore his fertility.
Smoking	Smoking can make conception more difficult. The risk for fertility problems increases with the number of cigarettes smoked each day. Women – Fertility can be affected. Men – May have a lower sperm count and may also produce a higher proportion of abnormal sperm.
Drinking alcohol	Men – Drinking excessive alcohol can cause men to have lower sperm counts, and it can affect the quality of sperm. Women – Even drinking lightly can have an effect on women's fertility.
Taking recreational drugs	Recreational drug use can affect fertility in both men and women. If taken over a long period of time, recreational drugs can cause permanent problems with the reproductive system and infertility.
Parental age	Women – As a woman ages, her ability to conceive and the quality of her eggs begin to decline. This decline becomes more rapid after the age of 35. Men – Men produce sperm all their adult life, including into old age. As long as they are capable of sexual intercourse, men can father children.
	1.2. Other factors affecting the pre-conception health for women
Folic acid	Taking folic acid during pregnancy can help prevent birth defects known as neural tube defects. This includes spina bifida, a condition where a baby's spine and spinal cord do not develop properly. Women are advised to take 400 micrograms (mcg) of folic acid per day as a supplement before conception and until the 12th week of pregnancy. They should also eat folate-rich foods such as green vegetables, brown rice and fortified breakfast cereals, to consume a combined total of 6000 mcg of folate a day from folate-rich foods and a supplement.
Up-to-date immunisations	Keeping immunisations up to date will contribute to keeping a woman healthy both before and during pregnancy. This in turn benefits the baby.

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Child Development

1.3. Types of contraception methods and their advantages and disadvantages

Barrier Methods

Method:	Male and female condoms – A male condom is a sheath made from latex. A female condom is a sheath made from polyurethane.
Advantage	It helps protect against many STIs.
Disadvantage	Can come off or split open, making it ineffective.
Method:	Diaphragm or cap – A dome-shaped piece of latex or silicone that covers the cervix.
Advantage	Helps to protect against some STIs.
Disadvantage	Can cause cystitis.

Natural Family Planning

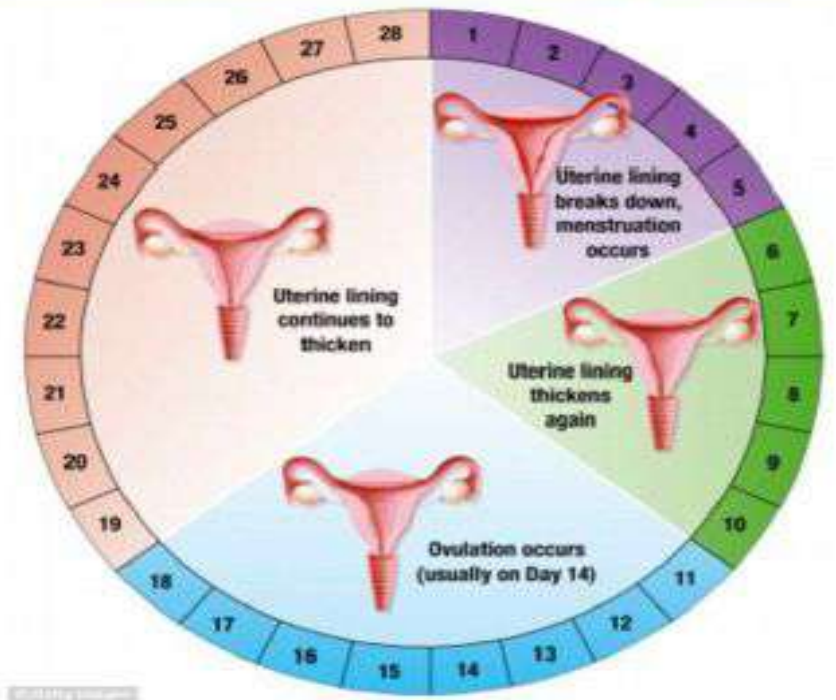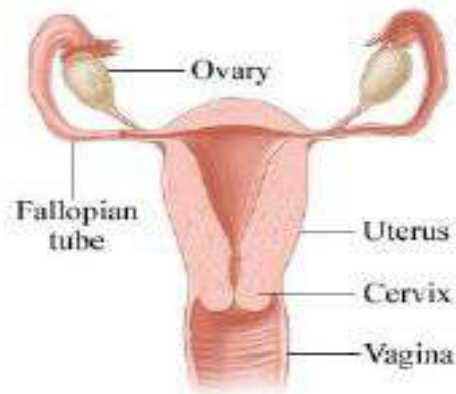|	
Methods:	Temperature – Monitoring her temperature. Cervical Mucus – Monitoring bodily secretions. Calendar – Monitoring the dates in her menstrual cycle.
Advantage	Methods are compatible with all cultures and faiths (because some do not permit the use of contraception).
Disadvantage	Requires rigorous tracking and monitoring to be accurate.

Hormonal Methods

Method:	Contraceptive pills: Combined pill – A tablet containing hormones (oestrogen and progestogen) that prevent ovulation.
Advantage	Using this method does not interrupt sex.
Disadvantage	Ineffective if the woman vomits or has severe diarrhoea.
Method:	Contraceptive pills: Progestogen-only pill – Causes the mucus in the cervix to thicken so that sperm cannot come into contact with an egg.
Advantage	Can be used immediately after giving birth.
Disadvantage	Side effects: spot-prone skin, tender breasts, irregular periods.
Method:	Contraceptive injection – An injection received every few weeks which causes the mucus in the cervix to thicken so that sperm cannot come into contact with an egg.
Advantage	Suitable for those who find it difficult to take a tablet at the same time each day.
Disadvantage	After stopping the injections, it can take up to a year to get fertility levels back to normal.
Method:	Contraceptive implant – A health professional will insert a small flexible tube into the skin of a woman's upper arm which releases progestogen hormone into the body.
Advantage	Can be used immediately after giving birth.
Disadvantage	Periods may change to become lighter, or heavier and longer.
Method:	Intrauterine device/system – A small T-shaped plastic device inserted into the uterus which releases progestogen hormone.
Advantage	Effective for 3-5 years, depending on the type.
Disadvantage	May make periods lighter, shorter or stop altogether.
Method:	Contraceptive Patch – Worn on the skin and introduces hormones (oestrogen and progestogen) to the body.
Advantage	Still effective if the woman vomits or has severe diarrhoea.
Disadvantage	Side effects: Headaches and raised blood pressure.
Method:	Emergency contraceptive pill – Prevents pregnancy after a woman has had unprotected sex or contraception method has failed.
Advantage	Available free of charge from some clinics.
Disadvantage	Must be taken within a specific time frame (3 or 5 days).

HOW EFFECTIVE IS YOUR BIRTH CONTROL?

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Child Development

1.4. The structure and function of the reproductive systems

The female reproductive system	
Ovaries	Control the production of the hormones oestrogen and progesterone, which govern the development of the female body and menstrual cycle. Inside the ovaries are undeveloped egg cells called ova.
Fallopian tubes	These tubes connect the ovaries to the uterus and are lined by minute hairs called cilia. Each month, one of the ovaries releases an egg into a tube, and the hairs help the egg to reach the uterus.
Uterus/womb	This is where the foetus grows and develops. It is here that an egg will become implanted.
Cervix	This is a very strong ring of muscles between the uterus and vagina, and it is usually closed. It keeps the foetus securely in place in the womb throughout pregnancy. The cervix dilates (opens) during labour to allow the baby to be born.
Vagina	Connects the cervix to the outside of the body. It is here that the man's penis enters the body during sex. Folds of skin called labia meet at the entrance of the vagina, forming the vulva. Urine passes through the urethra, which opens into the vulva but is separate from the vagina.
The menstrual cycle	This is the cycle in which women have their periods and are fertile (can conceive). Girls begin having periods when they are sexually mature (average age: 12) until menopause (average age: 51).

Male reproductive system	
Testes	The scrotum contains two testes. These make millions of sperm and produce hormones including testosterone, which governs the development of the male body.
Sperm duct system/epididymis	The sperm duct system consists of the epididymis, which contains the sperm, and the vas deferens, which are the sperm ducts (tubes) that sperm pass through.
Urethra	This tube inside the penis carries both urine and semen, but not both at the same time. A ring of muscle controls this.
Penis	Vas deferens: A muscular tube that extends upwards from the testicles, transferring semen that contains sperm to the urethra Seminal vesicles: A pair of glands found in the male pelvis. The glands produce many of the ingredients of semen.

Ovary

Fallopian tube

Uterus

Cervix

Vagina

Uterine lining breaks down, menstruation occurs

Uterine lining thickens again

Uterine lining continues to thicken

Ovulation occurs (usually on Day 14)

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R057 – Health and Wellbeing for Child Development

TA1: Pre-conception health and reproduction

Child Development

1.5. How reproduction takes place	
Ovulation	Around day 14 of the menstrual cycle, an egg is released from one of the ovaries and travels along the Fallopian tube.
Conception/ fertilisation	A sperm penetrates an egg following ejaculation of sperm from the penis into the vagina. The sperm passes through the cervix and uterus, and meets the egg in the Fallopian tube and loses its tail. The egg and sperm then fuse as one cell. The fertilised egg continues along the Fallopian tube. Between 4-5 days later, there is a mass of around 16 cells. This forms a ball of tissue (the blastocyst).
Implantation	After around another 7 days, the fertilised egg arrives in the uterus and implants itself in the enriched lining. Once it is attached firmly, conception has been achieved and the egg is called an embryo.
Development of the embryo and foetus	Amniotic fluid: The protective liquid which is contained in an amniotic sac. This provides a cushion for the foetus, helping to keep it safe from bumps and injury. It also contains nutrients, hormones and antibodies for the baby.
	Umbilical cord: A tube that connects the foetus to the mother during pregnancy. It has a vein that takes food and oxygen from the placenta to the baby, and two arteries that carry waste from the baby to the placenta.
	Placenta: An organ that develops in the mother's uterus during pregnancy. It is attached to the wall of the uterus. The baby's umbilical cord arises from the placenta. The placenta supplies oxygen and nutrients to the baby and removes waste from the baby's blood.
	How the embryo becomes a foetus: At the age of 8 weeks, the embryo becomes a foetus.
Multiple pregnancies	Identical twins: One fertilised egg divides into two cells. Non-identical/fraternal twins: Two separate eggs are released and fertilised by two different sperm.

1.6. The signs and symptoms of pregnancy	
Breast changes	– Become larger – Feel tender – Feel tingling – Veins more visible – Nipples appear darker – Nipples stand out
Missed period	– The first sign of pregnancy is a missed period or a very light period.
Nausea	– Feeling sick and nauseous, and/or vomiting during pregnancy can occur at any time of day. – This symptom generally begins 6 weeks after a pregnant woman's last period.
Passing urine frequently/ discharge	– Pass urine more frequently – Constipation – Increase of vaginal discharge
Tiredness/ emotional	– Women may feel tired or exhausted, particularly during the first 12 weeks of pregnancy, because of hormonal changes in the body. – These hormonal changes can also cause a woman to feel emotional and upset at this time.

I TRIMESTER   **II TRIMESTER**   **III TRIMESTER**

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

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Some Background

- A computer's CPU is made up of millions of tiny switches called transistors.
- These switches can be either on or off.
- We therefore use binary to represent these switches, since a binary digit can be either 0 or 1.
- 0 represents a transistor which is off, 1 represents one which is on.

Truth Tables

- Used to show the output of logic gates or logic circuits.
- To create a truth table:
  - Calculate how may rows are needed (2number of inputs)
  - So 4 inputs would need 24 or 16 rows
  - List the values for each input
  - Work through the diagram to complete the output for each possible input

Bringing It All Together

- Two or more logic gates are often used one after the other.
- This could be several of the same gate, or several different gates.
- This is known as a Logic Circuit.
- It is important to consider the order in which the gates are used.
- We can use diagrams and truth tables to represent these as shown below.
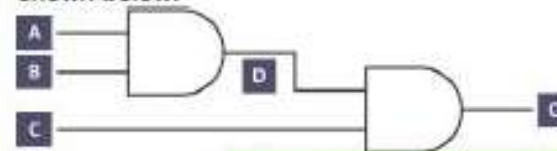
A	B	C	D	Q
0	0	0	0	0
0	0	1	0	0
0	1	0	0	0
0	1	1	1	0
1	0	0	0	0
1	0	1	0	0
1	1	0	0	0
1	1	1	1	1

2.4 – Boolean logic

The AND Gate

- Will output 1 if both A and B are 1.
- Will output 0 if either A or B is 0.
- Written as A $\wedge$ B

A	B	A$\wedge$B
0	0	0
0	1	0
1	0	0
1	1	1

The OR Gate

- Will output 1 if either A or B are 1
- Will output 0 if both A and B are 0
- Written as AVB
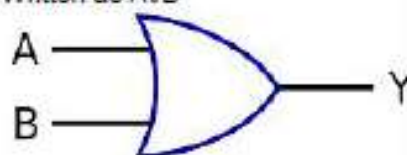
A	B	AVB
0	0	0
0	1	1
1	0	1
1	1	1

The NOT Gate

- Has a single input
- Inverts the input (1 becomes 0 and 0 becomes 1)
- Written as NOT A
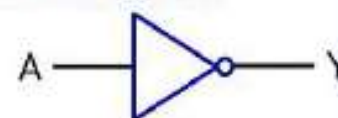
A	NOT A
0	1
1	0

Key Terms

- **Logic Gate** – components which compare one or more inputs based on a logical function to provide a single output.
- **Logic Diagram** – a diagram showing one or more logic gates.
- **Transistor** – components contained in the CPU which can be either on or off.
- **Truth Table** – a table representing the possible outputs of a logic gate or diagram
- **Logic Circuit** – two or more logic gates used together one after the other
- **Binary** – a number system containing two symbols, 0 and 1. Also known as Base 2

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2.2 Programming Fundamentals

Sequencing
- Breaking down complex tasks into simple steps.
- The order of steps matter
- Step by step progress through a program
- Benefits
  - Each line follows the next.
  - Can create simple programs very quickly.
  - Easy to follow for a small program.
- Disadvantages
  - Not very efficient.
  - Difficult to follow with large programs.
  - Hard to maintain.

Data Types
- Integers – whole numbers e.g. 27
- Reals – numbers containing decimals e.g. 56.2
- Boolean – TRUE or FALSE
- Strings – alphanumeric characters e.g. hello
- Casting is used to convert data from one type to another. This is often used to convert string input to integer or real to allow for calculation

Sub Programs
- Used to save time and simplify code
- Allows the same code to be used several times without having to write it out each time
- Procedures are sets of instructions stored under a single name (identifier)
- Functions are similar to procedures but will always return a value to the main program
- Parameters are values passed into a sub program. These are referred to as arguments when calling the sub program
- Both procedures and functions can accept parameters

Arrays
- An ordered collection of related data
- Each element in the array has a unique index, usually starting at 0
- All elements must be the same type of data
- Arrays are usually a fixed size
- 1D arrays are similar to a simple list, each element needs a single index number
- 2D arrays are similar to tables, with each element needing two index numbers
- 2D arrays are usually used to store properties of objects, with objects in rows and properties in columns
- Fruits[1] references element 1 in the 1D Fruits array
- Tools[0,2] references element 0,2 in the Tools array

The Use Of Records To Store Data And SQL
- Data is often stored in databases, providing persistent storage for data.
- Data within databases is stored in records, which in turn are stored in files.
- Records contain several attributes, each attribute is a single point of data.
- SQL (Structured Query Language) is a programming language designed for interacting with databases.
- SQL uses the SELECT command to search and read databases

SELECT * FROM Books	Returns all columns and records in the Books table
SELECT Title FROM Books	Returns only the title column from the Books table
SELECT * FROM Books WHERE Author="Bob"	Searches the Books table for records where the Author is Bob. Returns all Columns
SELECT * FROM Books WHERE Author="Bob" or Author="Tim"	Searches the Books table for records where the Author is Bob or Tim. Returns all Columns
SELECT * FROM Books WHERE Author!="Bob"	Searches the Books table for records where the Author is not Bob. Returns all Columns
SELECT Title FROM Books WHERE Sales>=100	Searches the Books table for records where Sales is greater than or equal to 100. Returns only the Title column

String Manipulation
- stringname.length – returns the length of a string
- stringname.upper – converts the string to uppercase

```
string = "John"
```

string.length	The length of the string	4
string.upper	Convers to upper case	JOHN
string.lower	Converts to lower case	john
string.substring(1,2)	Returns part of the string	oh
string.left(3)	Returns from the left of the string	Joh
string.right(2)	Returns from the right hand side of the string	hn
string+string	Concatenates or joins strings	JohnJohn

Keywords
Variables:
- A box in which data may be stored
- Content changes as the program runs.
- Different types e.g. string, decimal, etc.

Assignment:
- The process for changing the data stored in a variable
- Copies a value into a memory location
- Different values may be assigned to a variable at different times during the execution of a program.
- Each assignment overwrites the current value with a new one.

Constants:
- Data does not change as the program runs
- Used to reference known values such as pi

Inputs:
- May come from the user, a file or elsewhere in a modular program
- Usually treated as text even if containing numbers

Outputs:
- The end result of the program
- May be displayed on the screen, written to a file, or sent to a device

Operators:
- Used to manipulate and compare data

Operators
Arithmetic Operators

+	Addition
-	Subtraction
*	Multiplication
/	Division
MOD	Modulus (the remainder from a division, e.g. 12 MOD 5 gives 2)
DIV	Quotient (integer division, e.g. 21 DIV 5 gives 4)
^	Exponentiation (to the power of, e.g. 3^3 gives 27)

Comparison Operators

==	Equal to
!=	Not equal to
<	Less than
<=	Less than or equal to
>	Greater than
>=	Greater than or equal to

Boolean Operators
AND - two conditions must be met for the statement to be true
OR - at least one condition must be met for the statement to be true
NOT – inverts the result, e.g. NOT(A AND B) will only be false when both A and B are true

File Handling Operations
- Files can be opened for reading or writing
- Append mode adds to the end of the file
- Write mode overwrites existing content in the file

myFile := OPEN ("test.txt") FOR READING	Opens test.txt in read mode into the myFile variable
WHILE NOT myFile.EOF OUTPUT myFile.READLINE() END WHILE	Uses a while loop to output each line of the file (READLINE) until the end of file (EOF) is reached.
myFile.CLOSE()	Closes the file

myFile=OPEN ("logfile.txt") FOR APPEND	Opens the logfile.txt file in append mode, meaning the existing content is preserved
myFile.WRITELINE("This is a log entry")	Writes to the end of the file
myFile.CLOSE()	Closes the file

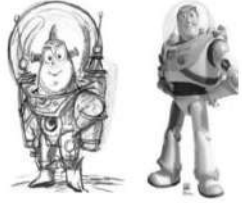| myFile=OPEN ("textfile.txt") FOR APPEND | Opens the textfile.txt file in write mode, meaning the existing content will be overwritten |
| myFile.WRITELINE("This is a log entry") | Writes content to the file |
| myFile.CLOSE() | Closes the file |

Selection
- Allows the program to make decisions
- Uses conditions to change the flow of the program
- Selections may be nested one inside another
- IF statements perform comparisons sequentially and so the order is important
- SELECT CASE has less typing but is less flexible

```
IF X > 50 THEN
    OUTPUT "A*"
ELSE IF X > 30 THEN
    OUTPUT "A"
ELSE
    OUTPUT "Fail"
END IF

SELECT CASE X
    CASE >100
        OUTPUT "A*"
    CASE >80
        OUTPUT "A"
    CASE >60
        OUTPUT "B"
    CASE ELSE
        OUTPUT "Fail"
END SELECT
```

Iteration
- Running through or 'iterating' through a set of steps several times.
- Also known as looping
- Count controlled iteration
  - Repeats the same code a set number of times
  - Uses a variable to track how many times the code has been run
  - This variable can be used in the loop
  - At the end of each iteration the variable is checked to determine if the code should be run again
  - FOR sets how many times the code should be repeated
  - NEXT tells the code to return to the start of the loop
  - STEP sets how the variable should increment
- Condition Controlled Iteration
  - Uses a condition to determine how many times code should be repeated
  - While loops will run whilst a condition is met and use the statements WHILE and ENDWHILE
  - Repeat loops will run until a condition is met and use the statements REPEAT and UNTIL

```
FOR count = 2 to 10 STEP 2
    OUTPUT count * 3
NEXT count

count = 0
WHILE count < 6
    print("Hello World")
    count = count + 1
ENDWHILE
```

Random Numbers
- Many different applications in computer programs from simulating dice in computer games, to cryptography
- Depending on the language we may specify just the maximum number assuming starting from 1 (e.g. roll = random(5)) or the first and last possible values (e.g. roll = (3,9))
- In many cases our desired output may not be a number and so we must then use selection, such as an IF or CASE statement, to convert the number into an actual choice
- We can also use the random number to select a random element from an array. This is more efficient then writing lots of IF statements.

Mood boards and Visualisation Diagrams

A	Mood boards: Content
1	Images
2	Colours
3	Colour schemes
4	Fonts
5	*Graphics*
6	*(digital only)* **Sound**
7	*(digital only)* **Video**
8	*(physical only)* **Fabrics**
9	*(physical only)* **Materials**

B	Mood boards: Purpose
1	*Generation* of ideas
2	*Development* of ideas
3	Communication of ideas with clients or colleagues
4	Creating a mood or feel

C	Mood boards: Key Vocab	
Generation		Creation
Development		Gradual improvements
Physical		On paper
Digital		On screen

D	Visualisation Diagrams: Content
1	Drawn images
2	Different viewpoints (eg bird's eye, plan etc)
3	Graphics (eg logos, barcodes etc)
4	Layout
5	Font and style of text (not necessarily the content)
6	Annotations showing details (eg size, interactivities, colours etc)

E	Visualisation Diagrams: Purpose
1	Show how a finished item may look
2	Plan layout of a product visually
3	Show actions or interactivity

F	Visualisation Diagrams: Key Vocab	
Graphics		Images made of simple shapes and colours
Layout		The way parts of something are arranged
Interactivity		The way something reacts with something else (eg what a button would do on a webpage)

A	Target Audience Categories
1	Gender
2	Age
3	Ethnicity
4	Income
5	Location
6	Accessibility

C	House Style
1	Fonts
2	Colour schemes
3	Logos
4	Design styles

Scripts and Mind Maps

A	Scripts: Content
1	**Dialogue**
2	**Stage directions**
3	**Sound effects**
4	**Names and details of characters**
5	**Music or ambient sound**
6	**Location**

C	Scripts: Key Vocab	
Audio		To do with sound
Audio-visual		Combining sound and pictures (i.e. films)
Formatting		How the words are presented on the page
Indentation		Set in from one side of a page
Dialogue		Talking between characters

B	Scripts: Purpose
1	Show the dialogue and delivery directions for actors
2	Indicate sound effects and scene requirements for production crew
3	Outline of a production for clients, advertisers or any other stakeholders

D	Mind maps: Content
1	Central *node* with main theme
2	*Sub-nodes* with related *general* ideas
3	Sub-sub-nodes with *specific* ideas
4	*Links* between nodes
5	Text to show ideas
6	Sometimes Images

E	Mind maps: Purpose
1	Generate ideas
2	Develop ideas
3	Visually display how ideas might relate

F	Mind maps: Key Vocab	
Node		An idea in a mind map
Sub-node		A node which is further away from the central node (i.e. *Menu* is a sub-node of *Website*. *Info* is a sub-node of *Menu*)
Link		A connection between nodes
General		Relating to lots of things
Specific		Relating to few things

C	Camera Vocab	
	Camera Shots	
Establishing shot		Wide angle including characters and setting
Two shot		Shot including two characters in dialogue
Close up		Shot of one character's whole head
Extreme close up		Shot of a particular detail (should be used sparingly)
	Camera Angles	
Low angle		Shot from below, looking up at a character
High angle		Shot from above, looking down at a character
Mid angle		Shot showing the upper body and head of a character
Wide angle		Shot including the whole body of a character
Over shoulder		Shot with the back of a character's shoulder and head in the foreground, putting the viewer in the scene
Point of View		(normally hand held) shot as if the camera is the eyes of a character, putting the viewer in the position of the character

Year 10 Dance – Component 2

LAA: Use rehearsal processes
- Health and safety
- Attitudes to others including: Cooperation, Being supportive, Listening to others, Punctuality, Consistency, Commitment, Reliability, Being prepared, Being respectful
- Interpreting existing performance material
- Responding to feedback
- Warming up/cooling down
- Learning and recalling movement material
- Experimenting and improving skills and techniques

LAB: Apply skills and techniques
- physical skills e.g. actions, alignment, accuracy, balance, coordination, contraction, communication, dynamic range, energy, expression, extension, facial expression, flexibility, focus and control, gesture, movement memory, pace, posture, projection, rhythm, relaxation, stamina, spatial awareness, suspension, swing, trust, use of weight
- Applying physical and interpretive skills to a performance
- Communicating the meaning of a piece of existing repertoire

LAC: Review own development and application of performance skills
- Review development and application of skills.
- Responding to feedback, e.g. choreographer, teacher, peers.
- Identifying strengths and areas for development.
- Actions and targets for improvement.
- Reference to professional working practices.
- Use of terminology appropriate to the discipline/style of performance.

Physical skills:

Strength	The power exerted by a muscle.
Stamina	Being able to maintain physical energy for a period of time.
Posture	The way the body is held.
Balance	A steady or held position through even distribution of weight.
Co-ordination	Efficient combination of body parts.
Extension	Lengthening a muscle or limb.
Flexibility	The range of movement at a joint.
Alignment	Correct placement of body parts in relation to each other.
Isolation	An independent movement of an individual body part.
Mobility	The ability to move fluently from one movement to another.
Control	The ability to start and stop a movement, change direction and hold a shape efficiently.

Technical skills:

Accuracy	Being correct and precise in a movement.
Timing	The use of counts when moving to sound or music.
Dynamics	How a movement is performed.
Action	Gesture, Turn, Elevation, Travel Stillness
Spatial Content	Pathway, level, direction, size of movement, pattern, formation.
Spatial Awareness	Being aware of other dancers around you.

Expressive skills:

Focus	The use of eyes to enhance performance.
Facial Expression	The use of face to communicate mood, theme or atmosphere
Projection	The energy a dancer uses to connect with an audience
Phrasing	The way which the energy is distributed in a movement phrase.
Communication of Intent.	Communicating the theme of the performance

Target Setting:
Strengths– The area which you are good at. This could be a specific movement or sequence of movements.
Weaknesses– The area which is incorrect. This could be a specific movement or sequence of movements.
Targets– Ways which you can improve the weaker areas of a performance.
Setting Targets– Be specific and identify what needs improving, how specifically it can be improved and a time frame of how long it will take before improvements can be seen.

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Year 10 Dance – Component 2

Theme: Destinations
"the place to which someone or something is going or being sent"

Repertoire: *So Lonely* from *Message In A Bottle*.
Choreographer: Kate Prince
Dance company: ZooNation

Synopsis:
Message In A Bottle is an imagined story about one family. In a village in a country far away, the community live well and support each other. But when civil war breaks out, this idyll of existence is devastated as the community is broken and homes destroyed. We follow the fortunes of a father, mother and their three teenage children who face this brutal reality together. They are confronted with impossible choices. In order to survive, they must leave their homeland and undertake a perilous journey to safer shores. Along the way, they will be separated from each other and have to persevere alone.

Creating *So lonely*:
"Filming this section was really interesting. We had to film the shadow projections on green screen prior to opening and therefore had to make sure the choreography was set early on and then executed perfectly every show by the dancer so as to be synchronised with the shadow projection behind them."

ZooNation:
"ZooNation was founded by Kate Prince in 2002 and is best known for its work in the theatre, creating full length narrative dance productions influenced in equal parts by musical theatre, Hip Hop culture and music."
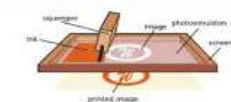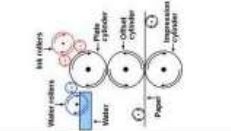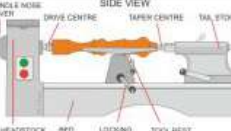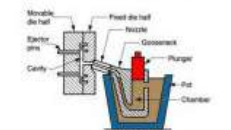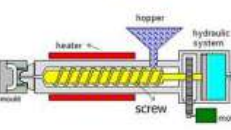
Kate Prince:
"ZooNation was founded by Kate Prince in 2002 and is best known for its work in the theatre, creating full length narrative dance productions influenced in equal parts by musical theatre, Hip Hop culture and music."

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Name of Process	Diagram	Material	Products Made	Key info
Screen-printing		Papers and Textiles	Posters, signs and t-shirts	Screen printing places paint on top of a screen. The screen has a stencil embedded in it, so when the paint is passed across it the desired shape is printed underneath. Good process in one-off and batch production as often done by hand
Offset Lithography		Papers and card (thin, flexible plastics)	Posters, newspapers, plastics bags	Rollers containing the colours and water go onto the plate cylinder. The water stops the colours sticking to certain places, creating the shape. The shape is transferred between rollers and onto the material. Can be used at batch and mass production
Lathe Turning		Wood and metal	Chair legs, baseball bats)(cylindrical items)	Material is placed between the tail stock and the headstock and spun at high speed. The material is then cut using specialist tools (either by hand or my automated machinery) to the desired shape. Can be used in one-off and batch production
Die Casting		Metal	Car parts, engine components, etc	Molten metal is poured into a chamber and a plunger forces the metal through the nozzle into the mould. Unlike sand casting, the mould is reusable. Good process for both one-of and batch production
Injection Moulding		Plastics	Chairs, toys, etc	Plastic granules are poured into the hopper and onto the screw. The screw moves the material towards the heater where it turns into a liquid. The liquid is then forced into the mould, cooled and released. Great process for mass production as it makes 100s+ of products at once, to a identical standard.

Name/ Type	How many it makes	Key Info	Examples of Products
One-off Production	1	• Also known as Bespoke or Prototype manufacture • Custom-made products • Specialist workers/ skills • Specialist machines and materials • High Quality but expensive	• Towers / Bridges • One-off Houses • Custom made clothes
Batch	10s-1000s	• Uses a mix of workers and machinery • Uses jigs, moulds and templates to help make identical products • Stations of workers e.g. cutting station, painting station, etc • Can have some variation e.g. colour, finish, flavour	• Baked foods • Limited edition car • Socks • Chairs
Mass	10,000s - 100,000s	• Big assembly lines (and sub-assembly lines) • Heavily automated • Standard and identical products • Little worker input	• Cars • Bottles • Microchips • Plain shirts
Continuous	100,00s +	• 24/7 production • Heavily automated • Standard and identical products • Little worker input	• Energy • Water • Paper • Plastic

Materials and their Properties: Timbers & Manufactured Boards

HARDWOODS

They are deciduous trees which means that in winter, they lose their leaves.

These trees are broadleaved, bushy and slow growing.

Overall they tend to be harder to work with and more expensive than other types of timbers.

They are less porous and denser cell structure which makes them harder wearing and less prone to rotting.

TYPES:

Name	Characteristics	Uses
Ash	Flexible, tough and shock resistant, laminates well. Pale brown/cream.	Sports equipment and tool handles.
Beech	Fine finish, tough and durable. Dense close grain with an	Children's toys, models and furniture.
Mahogany	Easily worked, durable and finishes well. Rich reddish brown in	High end furniture and joinery.
Oak	Tough, hard and durable, high quality finish possible. Light brown with variable grain.	Flooring, furniture and railway sleepers.

SOFTWOODS

They are coniferous trees which means that they keep their leaves in winter = evergreen.

These trees are tall and 'Christmas tree' tree shaped.

Overall they tend to be easier to work with and less expensive than other types of timbers.

They are more porous (holes) and if unprotected will rot. They have cones for leaves and grow quickly.

TYPES:

Name	Characteristics	Uses
Larch	Durable, tough and good water resistance. Machines well.	Exterior cladding, flooring, machine mouldings and furniture.
Pine	Lightweight, easy to work but can split.	Interior construction, cheaper furniture and decking.
Spruce	Easy to work, high stiffness to weight ratio.	Construction, furniture and musical instruments.
Redwood	Easy to work and machines well, some rot resistance.	Outdoor furniture, beams, posts and decking.
Cedar	Easy to work, can blunt tools, finishes well and naturally resistant to rot.	Outdoor furniture, fences and cladding for buildings.

MANUFACTURED BOARDS

They are sheets of processed natural timber and adhesives - so they are human made boards

These are usually made from waste wood, low-grade and recycled timber.

Can be covered by thin slices of high quality wood known as veneer to make it look aesthetically pleasing.
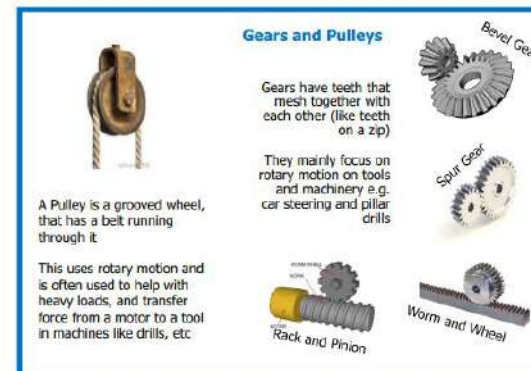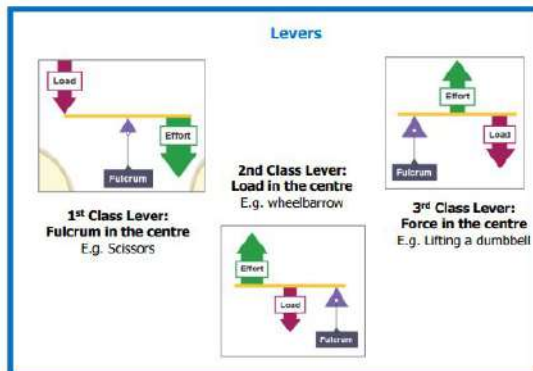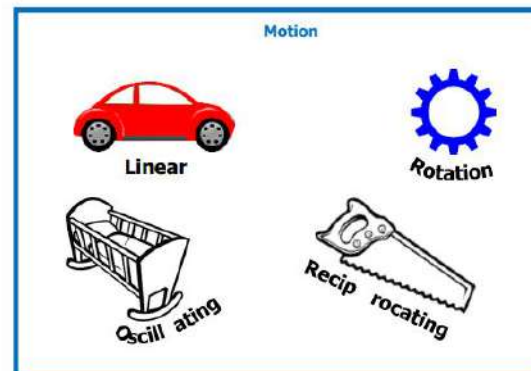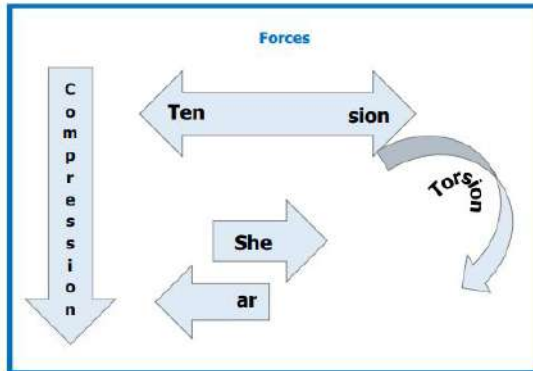
Cheaper than natural timber. They come in boards and have no grain.

TYPES:

Name	Characteristics	Uses
MDF	Rigid and stable, good value with a smooth easy to finish surface.	Flat pack furniture, toys and kitchen units.
Plywood	Stable in all directions as alternating layers. Flexible versions available.	Furniture, shelving, toys, interior and exterior construction.
Chipboard	Good compressive strength, not water resistant and prone to chipping on edges.	Flooring, low end kitchen units and worktops.
OSB	Rigid and even strength, good water resistance.	Construction in interior and exterior house building.
Block board	Stable, tough and heavy. Finishes well.	Furniture, doors, shelving and indoor construction.
Hardboard	Flexible, even strength and easily damaged by water.	furniture and photo frame backing.

Mechanical Systems

Forces

Compression

Tension

Torsion

Shear

Motion

Linear

Rotation

Oscillating

Reciprocating

2. Branches are cut off and the logs are stored until they are transported to a **sawmill**.

3. When at the sawmill, machines such as **band saws** and **circular saws** are used to create boards/planks.

ENVIRONMENTAL IMPACT

Wood is considered a **sustainable resource** as new trees can be grown to replace those felled. Here are some **issues and positives** surrounding the impact that wood is having on the environment:

✗
- In many places, wood is being used at a greater rate which means it is unsustainable.
- Illegal felling is leading to deforestation as people aren't replanting trees.
- Deforestation helps with global warming.

✓
- To make sure you are buying sustainable timber, you need to make sure it is approved by the **Forest Stewardship Council** or the **Endorsement of Forest Certification.**

FSC

Levers

1st Class Lever: Fulcrum in the centre E.g. Scissors

2nd Class Lever: Load in the centre E.g. wheelbarrow

3rd Class Lever: Force in the centre E.g. Lifting a dumbbell

Gears and Pulleys

Bevel Gear

Gears have teeth that mesh together with each other (like teeth on a zip)

They mainly focus on rotary motion on tools and machinery e.g. car steering and pillar drills

Spur Gear

A Pulley is a grooved wheel, that has a belt running through it

This uses rotary motion and is often used to help with heavy loads, and transfer force from a motor to a tool in machines like drills, etc

Rack and Pinion

Worm and Wheel

Materials and their Properties: Polymers (Plastics)

THERMOFORMING

This group of polymers are able to be formed into a different shape over and over again. Known as thermoplastics.

These are generally more flexible, especially when heated.

These are easier to recycle.

Can be formed into complex shapes.

TYPES:

Name	Characteristics	Uses
Polyethylene terephthalate PETE	Easily blow moulded and fully recyclable.	Bottles, food packaging, sheeting and some food wraps.
High density Polyethylene HDPE	Lightweight, rip and chemical proof.	Milk bottles, pipes, hard hats and wheelie bins.

THERMOSETTING

This group of polymers, once set in shape CANNOT be reformed. Known as thermosets.

These are generally more rigid before and after they've been heated.

These are harder to recycle.

Make excellent electrical insulators.

TYPES:

Name	Characteristics	Uses
Epoxy resin	Stronger than other resins, expensive and heat resistant.	Bonding different materials together.
Melamine formaldehyde	Food safe, hygienic and lightweight.	Kitchenware - but it can't be put in the microwave
Urea formaldehyde	Heat resistant and very good electrical insulator	Electrical fittings, casings, buttons and handles.
Polyester resin	Reasonably strong, heat resistant and a good electrical insulator.	Waterproof coatings and flooring.
Phenol formaldehyde	Very hard and brittle. An excellent electrical insulator.	Electrical components, mechanical parts.

SOURCE/ORIGIN

Polymers come from **crude oil**. They can also come from **gas** and **coal**. This can be found beneath the Earth's surface. Below is how we get it and change it into polymers:
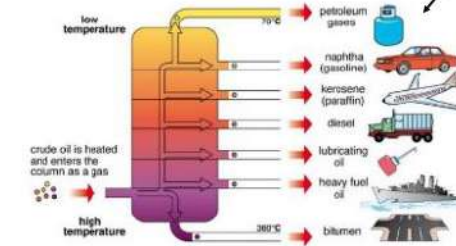
1. The oil is **extracted** from beneath the surface and stored. This can be done on land or in the sea.

2. This oil is then **transported** via a **crude tanker** to somewhere called an **oil refinery**.

3. When at the refinery, the oil is heated and at **different temperatures** this creates the different **products**.

ENVIRONMENTAL IMPACT

Polymers are considered a **finite resource** - this means that it will run out eventually as we only have a limited amount. However with development in technology there are some **biodegradable** ones, here are some of the impacts:

✗ - Do not biodegrade easily so release harmful toxins in landfills.
- Causes **air**, **visual** and **water** pollution.
- Takes a lot of energy to produce.

✓ - Some are able to be recycled so they don't use raw material (brand new e.g. crude oil).
- New technology has given way to fully biodegradable ones - **biopolymers**, so they are non toxic and not from a finite resource.

BIOPOLYMERS

Newer plastics are made from **vegetable starches** and can be composted - these are great for the environment. Here are some:

when heated, grips.

PLA - Polylactic Acid

Non toxic, easily shaped and typically used for 3D printers.

Used for pens, phone cases, disposable food and drinks containers.

Materials and their Properties: Metals & Alloys

FERROUS

This group of metals all contain iron.

Most of these metals are magnetic and will rust if they are exposed to moisture without a protective finish.

Iron is what causes the metals to rust quicker. They tend to have a higher melting point.

26 Fe Iron 55.045 ✓

TYPES:

Name	Characteristics	Uses
Low Carbon Steel (Mild Steel)	Tough and ductile, easily machined, formed, brazed or welded.	Construction, nails, screws, nuts and bolts. Many car bodies.
High Carbon Steel	Less ductile and harder than mild steel. Very hard wearing and keeps and edge well.	Garden or workshop tools, blades, scissors, wood and metal cutting tools.
Cast Iron	Hard but brittle. Easily cast into complex shapes but some are hard to machine.	Kitchen pots and pans, machine bases and bodies, drain covers and vices.

NON FERROUS

This group of metals do NOT contain iron.

Most of these metals are not magnetic and do not rust.

These can **Oxidise**. React with oxygen that causes the surface to change colour.

They include precise metals such as gold, silver and platinum and others such as lead and mercury which are poisonous.

26 Fe Iron 55.045 ✗

TYPES:

Name	Characteristics	Uses
Aluminium	Lightweight, high strength to weight ration, ductile and difficult to weld.	Pots and pans, sports car body panels, bike frames, drinks cans, foil or takeaway trays.
Copper	Ductile, malleable and a good electrical conductor.	Plumbing supplies, and electrical cables.
Tin	Soft, malleable and ductile, a good electrical conductor.	Used to produce cans and plating surfaces to make them last.
Zinc	Fair electrical conductivity, malleability and ductility; however, better when alloyed.	Mainly used to galvanise steel to prevent rusting.

ALLOYS

This group of metals is a mixture of at least one pure metal and another element.

The reason metals are alloyed is so that the added element makes the metal better - it improves it in some way.

These are more difficult to recycle as the metal has been mixed with something else.

TYPES:

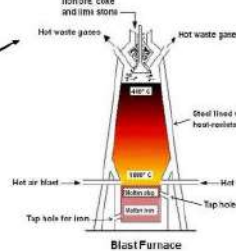| Name	Characteristics	Uses
Brass	A heavy alloy of zinc and copper that is malleable, easy to cast and machine.	Musical instruments, bushes and plumbing fittings.
Stainless Steel	Hard very smooth but difficult to weld. A ferrous metal alloyed with chromium, nickel and manganese.	Cutlery, kitchen and medical equipment.
High Speed Steel	Able to withstand the high temperatures created when machining at high speed, keeps cutting edges well.	Cutting tools such as drill bits, mill cutter, taps and dies.
Duralumin	Alloy of aluminium, copper, magnesium and manganese. Creates greater hardness and tensile strength.	Aircraft components, sports car wheels and casings.

SOURCE/ORIGIN

Metals come from the **ground/rocks** typically the Earth's crust - this is known as the source or origin of the material.

This is how we **extract** (remove) metals from the ground and create **iron ore**.

1. The material is mined using machines - the main two types are **surface mining** and **underground mining**.

2. These rocks are then **transported** to a factory to be separated from waste material.

Iron ore, coke and lime stone

Hot waste gases — Hot waste gases

Steel lined with heat-resistant bricks

Hot air blast — Hot air blast

Tap hole for iron — Tap hole for slag

Blast Furnace

3. To create the **iron ore**, the rocks are placed through the top of the furnace and it is heated.

As it heats, it starts to become a liquid and this sinks to the bottom.

As it becomes a liquid it is carried away from the bottom to be **refined** further into metals.

The waste material leaves in the other direction and is known as the **slag**. Waste material also leaves as gases.

ENVIRONMENTAL IMPACT

Metal is considered a **finite resource** - this means that it will run out eventually as we only have a limited amount. These are some of the impacts that metal has on the environment:

✗ - Finite resource so it will run out eventually.
- Causes **air pollution** from the gases that are released.
- Causes **visual pollution** from the mines that are created to get the raw material.
- Takes a lot of energy to produce.

✓ - Can be recycled over and over again. The quality will always be the same as the original so the material won't weaken over time.
- Lasts a long time and so it won't need to be replaced.
- Most metals can be recycled.

25

Materials and their Properties: Papers & Boards

BOARDS

The thickness of boards is measured in microns. 1000 microns = 1mm.

TYPES:

Name	Characteristics	Uses
Corrugated card	1000-5000 microns, strong and lightweight. Insulative and easily printed on.	Packaging, boxes and impact protection.
Duplex board	200-500gsm, stiff, lightweight coatings to improve functionality. Waxy coating for protection.	Cheaper version of white card used for packaging boxes.
Foil lined board	200-400gsm, stiff, foil reflects heat and a water and oil resistant coating enables food and liquid based products to be contained.	Takeaway containers and lids, used to retain heat for longer.

PAPERS

Paper is measured by weight in grams per square metre (GSM). This is how heavy it will be.

TYPES:

Name	Characteristics	Uses
Bleed proof paper	70gsm, coated to stop solvent based markers staining. Ink stays on the surface.	Marker pens when designing and final designs.
Cartridge paper	120-150gsm, completely opaque and more expensive.	Pencil and ink drawings, sketching and water colour.
Grid paper	Usually printed onto 80gsm paper with faint lines and often in blue.	Used for graphical, scientific and mathematical diagrams.
Layout paper	40-60gsm, semi translucent, takes pencil and most media well.	Creating sketches and working ideas.
Tracing paper	10-120gsm, translucent, takes pencil and most colour well.	Copying and tracing images.

SOURCE/ORIGIN

Paper and boards come from finely shredded wood but has been prepared in a special way to make what you know as paper and boards. This is how they are made:

1. **Pulp** - this is the finely shredded wood. Logs are **debarked** into fine chips. These are added to a chemical solution and cooked under pressure to make them into a paper pulp. These are called **cellulose fibres**. Depending on the colour, the fibrous liquid is then bleached or coloured.
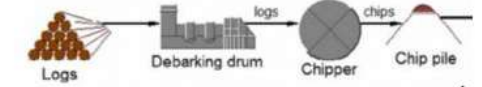
2. **Sizing** - this is a process where chemicals or other additives are beaten into the fibrous liquid. This stops it being so absorbent. This means it can then be photocopied, printed or painted onto.

Papers such as toilet roll or kitchen roll have little sizing so that they can absorb moisture. Otherwise they wouldn't work as toilet or kitchen roll.

3. **Converting Pulp to Paper** - the pulp (so the liquid fibrous) goes on a mesh conveyor belt to drain the excess water. It goes through lots of rollers to squeeze the last of the water out of the paper. Then through **drying rollers**, so it dries and finally through a set of **calender rollers** which give the paper the finish e.g. satin or matt. Here's a picture of the overall process together:

Materials and their Properties: Textiles

NATURAL FIBRES

Natural fibres come from 2 sources – these are plant based and animal based.

Fabrics from plant based are renewable but take a long time to grow.

TYPES:

Name	Characteristics	Uses
Cotton (plant)	Soft, strong and absorbent, cool to wear and easily washable. Good thermal properties.	Most clothing and can be used for denim.
Wool (animal - sheep)	Can be fine and thick, naturally warm and crease resistant. Can shrink.	Jumpers, coats, suits and carpets.
Silk (animal - silk worm)	Very soft and fine finish, gentle, warm in winter and cool in summer. Absorbent and strong.	Luxury clothing and bed sheets.

SYNTHETIC FIBRES

Synthetic fibres are ones that are man-made.

These can be made from recycled plastic bottles.

TYPES:

Name	Characteristics	Uses
Polyester	Tough, strong, hard wearing, very versatile, holds colour well and non absorbent.	Clothing, fleece garments, bedsheets, carpets, backpacks and umbrellas.
Polyamide (Nylon)	Good strength, hard wearing, non absorbent, machine washes well.	Clothing, ropes and webbings, parachutes and sports material.
Elastane (Lycra)	Added to fabric to enhance working properties, to add stretch. Freedom of movement.	Sportswear, exercise clothing, swimsuits and general clothing.

BLENDED & MIXED FIBRES

These fibres have been blended and mixed together - so natural mixed with synthetic.

TYPES:

Name	Characteristics	Uses
Poly-cotton	More durable than pure cotton but not as breathable. Can be produced more cheaply.	General clothing, sheets and bedding. Used as alternative to pure cotton.

WOVEN FABRICS

These are fabrics where they follow a pattern - one piece goes up and over whilst the other does the opposite. Weaving.

TYPES:

Name	Characteristics	Uses
Plain weave e.g. muslin and calico.	Simple and cheaper to produce, stronger than other weaves.	General clothing, sheets and bedding. Used as alternative to pure cotton.

NON-WOVEN FABRICS

These are fibres that haven't been spun into yarn - they have been bonded together through heat or adhesive (glue).

TYPES:

Name	Characteristics	Uses
Bonded fabric	Lack strength, no grain so can be cut in any direction and not fray.	Disposable products such as protective clothing
Felted fabric	Can be formed with moisture and heat - no elasticity when it has dried. Pull apart easily.	Hats, soundproofing and insulation.

KNITTED FABRICS

This is when yarn is interlocked (connect) with each other.

Weft - hand or machine and loops across the width.

Warp - these interlock vertically and less prone to unraveling and laddering.

TYPES:

Name	Characteristics	Uses
Knitted fabric	Warm to wear, different knits have different shapes, stretch and shape retention	Jumpers, cardigans, sportswear and tights.

SOURCE/ORIGIN

Fabric can be sourced from many places as you can see from the table. However they are mainly **animal sources, chemical sources and vegetable sources**. Then when you've got the source this is what happens:

1. This is what some of the **raw fibres** look like, this is once they have all been collected. E.g. you could have a pile of wool or cotton.

2. Then to turn this into **yarn**, the raw material is **spun or twisted** by hand or machine. It is spun and twisted until it becomes useable.

3. So it will look something similar to this once it has been further **processed**, such as being dyed. Some are further processed so they become thinner and smoother.

ENVIRONMENTAL IMPACT

Here are some of the impacts that manufacturing textiles has on the environment:

✗ - They use a lot of water in the processing stages to make sure that they are clean and useable.

- When being processed, they will release CO_2 into the environment causing **air pollution**.

- Throw away culture due to fashion

✓ - Almost all textiles are recyclable or biodegradable.

- Most sources of textiles are considered **sustainable** as they are available such as the cotton plant and sheep's wool.

- Can be reused or donated.

ENVIRONMENTAL IMPACT

Paper is considered a **sustainable resource** which means it is something that can continue going as it can be **replenished** (replaced) for example, you cut down a tree, plant 2 new ones or a new one. Here are some of the impacts on the environment:

✓ - Sustainable resource

- Can be recycled over and over again

- Decomposes over time if it does go into a land fill or if left on the ground.

PAPERMAKING process

Component 2: Developing Skills and Techniques in the Performing Arts

In this component, you will develop your preforming arts skills and techniques through the reproduction of acting repertoire as performers.

Drama

Learning Outcomes

Learning Outcome A - 12 Marks

To use the rehearsal process

You will participate in skills workshops that will teach techniques that are needed to explore and perform short extracts of a play.

Evidence Needed: Video recordings of rehearsals, annotated materials

Learning Outcome B - 24 Marks

To apply skills and techniques in performance

You will perform 5-15 minute extracts of a script and perform to an audience.

Evidence Needed: Video recordings of the performance

Learning Outcome C - 24 Marks

To review development and application of performance

You will review your rehearsal and development process, and performance outcomes.

Evidence Needed: Written Review

Key Vocabulary

Blocking	Deciding where an actor should stand during a scene.
Characterisation	Creating a character through your movement and dynamic choices.
Hot Seating	An in-depth questioning of a character.
Levels	The height you perform a movement – low, medium or high.
Multi-role	An actor plays multiple characters.
Naturalism	A style of performance where actors and designers try to create the illusion that what is happening on stage is 'reality'.
Physical Theatre	A style of theatre where the actor uses their body as the primary tool for performance.
Proxemics	Distance between characters to show a relationship.
Rehearsal	A practice of the play with the aim to improve.
Thought Tracking	Internal thoughts of a character spoken aloud to the audience
Use of Voice	Adapting your voice to suit a character requirement.

Tasks

Task One	Preparing for a performance
You will prepare for a performance, whilst developing and applying your skills and techniques, including: interpretive skills, performance skills, characteristic of the style/genre, communication of meaning, intention and links to theme, personal review and reflection of skills and progress and response to feedback.	

Task Two	Performance to an audience
It's time to showcase your performance or production designs for an audience. You will need to demonstrate: technical skills, performance skills appropriate to the material, application of stylistic and interpretative skills and communication of your creative intentions.	

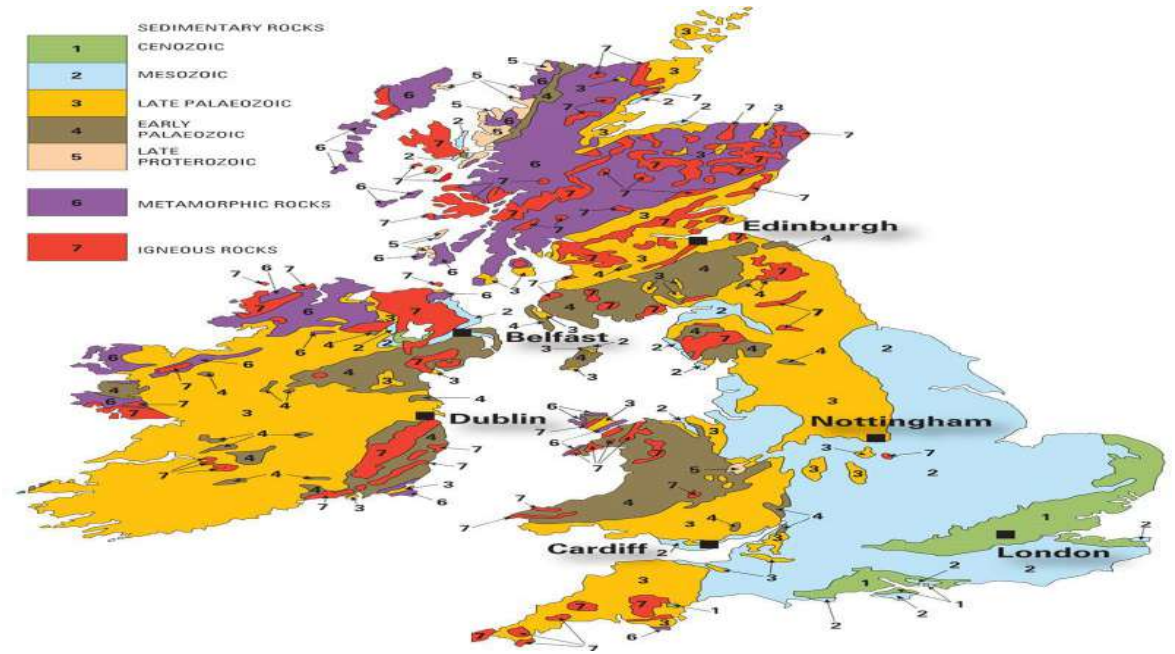| Task Three	Reviewing development and performance
Review your development and application of skills and techniques during your rehearsal process and during your final performance. The review of your rehearsal/production process should include commentary on your preparation and use of targets to develop your skills and techniques relevant for the selected extract of existing professional repertoire. The review of your final performance should include commentary on your application of skills and techniques	

KNOWLEDGE ORGANISER: JEKYLL AND HYDE

PLOT SUMMARY

Chapter	Summary
Chapter 1: Story of the Door	Utterson is taking his Sunday walk with friend Enfield. In a well-kept street they stumble upon a derelict doorway, which prompts Enfield to tell a story linked to the doorway. Late at night he had seen a man run into and trample a small girl. A crowd gathered who demanded £100 from him as compensation to the girls' family. The man went into the battered doorway and produced a cheque signed by a respectable man (whom Enfield does not name). Enfield tells Utterson there was something very disturbing about the man who trampled the girl. He gives his name as Hyde.
Chapter 2: Search for Mr Hyde	U reads over his friend Jekyll's will. It says if he dies or disappears all his possessions will go to Hyde. Disturbed, Utterson visits Dr Lanyon, who says he no longer speaks to Jekyll. After troubled dreams, U decides to meet Hyde for himself. He finds him repellent. He goes to Jekyll's house but Jekyll isn't in. The servant Poole reveals the staff has instructions to obey Hyde.
Chapter 3: Dr Jekyll was quite at ease	Utterson goes to a dinner party at Jekyll's house. He stays behind to talk to Jekyll. He asks about Mr Hyde. Jekyll refuses to talk about Hyde, but tells Utterson he can be "rid of him whenever he chooses". He asks Utterson to insist to obey the instructions in the will. U agrees.
Chapter 4: The Carew Murder Case	A year later. The murder of Danvers Carew is told through the story of a maid who witnessed it. Half a broken cane and a letter to Utterson were found near the body. Utterson and Newcomen (the police officer) search Hyde's rooms. They find burned papers, the other part of the cane and a burned cheque book. At the bank they find Hyde has several thousand pounds.
Chapter 5: Incident of the letter	Utterson goes to see Jekyll and fins him pale with shock and illness in his 'cabinet' (room above the laboratory). Jekyll says he's heard people outside shouting about the murder of Carew. J tells U he will have no more to do with Hyde and is confident Hyde will disappear. J shows U a letter signed Edward Hyde that was hand delivered. It thanks J for his generosity and says he can escape safely. U is relieved. U takes the letter and shows it to his head clerk Mr Guest. Guest is a handwriting expert. A servant comes in with a note from Jekyll. Guest notices the handwriting is similar. Utterson now thinks Jekyll forged the letters from Hyde, writing it himself.
Chapter 6: Remarkable incident of Dr Lanyon	Hyde has disappeared. For two months Jekyll returns to his old self and is friendly and sociable. J suddenly refuses to see Utterson again which alarms Utterson. U then visits Lanyon and finds him very physically changed and disturbed. L refuses to talk about J, saying he views him as dead. U is puzzled and writes to J, asking why he won't see his friends. J's reply is mysterious. Lanyon dies two weeks later. U gets letter from Lanyon, not to be opened unless J disappears. U tries to visit J but is turned away. Poole tells him J spends most of his time in the lab.
Chapter 7: Incident at the window	On another Sunday walk with Enfield, U tells E he once saw Hyde and felt revulsion. E reveals he has since found out that the doorway is the rear entrance to J's laboratory. The pair come to the courtyard near the door and step in. they see J sitting at an upstairs window and call to him. They invite him to walk with them and he refuses. A look of horror passes across J's face and he disappears. Appalled by the look they saw in J's face, E and U walk away.
Chapter 8: The Last Night	Poole visits U as he fears something is wrong with J. At J's lab, a voice refuses to let them in. P says he fears J was murdered 8 days previously as he heard him cry out. He worries the murderer is still inside. U and P arm themselves and break in. They find the body of Hyde, in clothes too big for him, twitching on the floor. They can't find J. They find an envelope addressed to Utterson. It contains a new will (in Utterson's favour) a note telling U to read the letter he has form Lanyon and a long letters from J. They lock the cabinet with Hyde's body inside and U goes home to read the documents.
Chapter 9: Dr Lanyon's narrative	The contents of Lanyon's letter tells of how he received a letter from J asking him to collect chemicals, a vial and a notebook form J's lab and give it a man who would arrive at midnight. A grotesque man arrives and drinks the potion which turns him into Jekyll, causing Lanyon to fall ill.
Chapter 10: Henry Jekyll's full statement of the case	Jekyll tells the story of how he turned into Hyde. It began as a scientific experiment into the duality of human nature and an attempt to rid himself of his 'darker side'. Eventually he became addicted to being Hyde, who took over and destroyed him.

VOCABULARY BANK

- Duality
- Repressed
- Evolution
- Secrecy
- Reputation
- Victorian Gentleman
- Isolation
- Depraved
- Degenerate
- Debased
- Savage
- Subconscious
- Revulsed/revulsion
- Restraint/restrained
- Suppression/suppressed
- Gothic
- Tension
- Mystery
- Allusion
- Morality
- Vice
- Rational/rationality
- Contrast
- Atavism/atavistic
- Mysticism
- Unorthodox
- Uncanny

CHARACTERS

Character	Description
Dr Henry Jekyll	Doctor with an interest in the supernatural. Respected man but with a mysterious past which Utterson hints at. Protagonist of the novella. We only hear about him through his reputation, and then later from Lanyon as "wrong in the mind". The reader does not know he's the same man as Hyde until Chapter 9. We only really hear from J when he tells his own story at the end.
Mr Edward Hyde	Jekyll's alter-ego. Hyde is the evil aspect of Jekyll manifested in a separated identity. Also responsible for the main events in the narrative—the trampling of a girl, murder of Carew, death of Lanyon and destruction of Hyde. A strange, repugnant man who looks faintly pre-human. He's violent and cruel, and everyone who sees him describes him as ugly and deformed—yet no one can say exactly why.
Mr Gabriel Utterson	Well-respected lawyer. Like Lanyon, he represents Victorian society's devotion to rational explanations and denial of the supernatural. Perhaps slightly lacking in imagination, meaning he is unable to see the connection between J/H and puts it down to a 'rational' explanation—blackmail. As a reader we follow him as a guide and we too are led to the wrong conclusion about the relationship between J&H.
Dr Lanyon	Respected London doctor and one of Jekyll's closest friends until their disagreement. Represents rationality, reason, and science. His character serves as a contrast to Jekyll's mysticism in the novella. His death symbolises the supernatural 'winning' over science/reason—terrifying for Victorian readers!
Mr Enfield	Reserved, formal, no interest in gossip. Represents 'Victorian gentleman' - values reputation highly.
Poole	Jekyll's butler. A working class character, socially inferior to other characters due to his role. Knows J very well—including the sound of his footsteps – which is crucial in the decision to break down the door at the end. Discreet about J's business until his fears lead him to act.
Inspector Newcomen	Delighted with the Carew case as it will be good for his career if he can solve it—Carew is a high profile victim. Could represent slightly chaotic police force newly formed in Victorian age.
Sir Danvers Carew	High-profile murder victim and friend of Utterson's. Described as an elegant and sophisticated old man of high social standing. A perfect 'victim' as he is such a contrast to the depraved Hyde.
Mr Guest	Handwriting expert that notices the similarity between Jekyll and Hyde's handwriting. Drives the narrative forward as the handwriting deepens the mystery. Again, like Utterson, we are on the wrong track thinking J is forging letters for H.
Female characters	Maid—watches the murder of Carew and faints. Story told from her perspective embellishes some of the details—to add tension and intrigue. Gothic 'damsel in distress' figure. Hyde's landlady—Gives information about Hyde's comings and goings. Seems pleased he is in trouble.

EXAM QUESTION EXAMPLES

Starting with this extract, how does Stevenson present Hyde as a frightening outsider?

Starting with this extract, how does Stevenson create mystery and tension in the novella?

Starting with this extract, explore how Stevenson presents secrecy and the unknown in the novella

Starting with this extract, how does Stevenson present Utterson as a reliable and rational narrator?

Starting with this extract, how does Stevenson use settings to create tension in the novel?

Starting with this extract, how far do you agree Stevenson creates Dr Jekyll as a character we can feel sympathy for?

EXAM TIPS AND PHRASES

Keep your answer really relevant to the question asked.

Start with a **thesis**—answer the question and link to Stevenson's intentions/context if relevant

Annotate the extract. Look closely at language you can pull apart. Look for wider themes/techniques that span the novel.

Either answer on extract first, wider novel second OR alternative between the two.

Use the writer's name. Remember characters are not real– they are constructs made by the writer.

THEMES

Theme	Description
Duality	Plot hinges on the idea of the duality of human nature. Stevenson suggests we have two parts to us: a part that is concerned with physical appetites and pleasures and a higher part concerned with intellectual pleasures and moral behaviours. There is a tension between these two parts of the soul; between instincts and how society conditions us to behave. Other types of duality in the novel include good vs evil, science vs the supernatural and appearances vs reality.
Good vs Evil	Evil is personified in Hyde in the novel. He is entirely selfish, indulging in his own appetites without regard for others. Good is shown in the novel as being generous and kind. Jekyll is a "good" religious man and a "good" friend when not under the influence of Hyde. Hyde is frequently contrasted with the people he does evil to, who are presented as very innocent and good: the innocent young girl and Carew, who is described in a similar innocent way.
Friendship and loyalty	There are a few key friendships in the novella: Jekyll and Lanyon, Jekyll and Utterson, Utterson and Enfield. Friendship and loyalty act as spurs to action in the novella: Utterson's friendship with Jekyll leads him to investigate Hyde. Poole seeks the help of Utterson as he's Jekyll's friend. Jekyll turns to Lanyon when he needs chemicals. Friendships are sometimes shown to be marred by secrets. Reputation seems to play a part in some of the friendships in the novella, although there are clearly genuine feelings too.
Appearances vs reality/ secrets	Few things are as they appear. J is respectable, yet he has his secret inner identity. Hyde appears to be a normal 'person' (if a bit ugly) but he's actually a product of a potion. It appears Jekyll is being blackmailed, yet he isn't. Lanyon's illness looks to be physical, however it is the effects of seeing Hyde's transformation. As readers we are also taken in by what appears to be real but turns out not to be.
Science	Two forms of science are shown: Lanyon's type of science is rational. Jekyll is more mystical/spiritual. This comes across in language each character uses: Lanyon's is very factual and clear.. Jekyll's is more abstract and metaphorical - normal language of science can't describe his other-worldly experiences.

CONTEXTS AND WRITER'S INTENTIONS

Context	Description
Duality and the Victorian Gentleman	Social conventions were so strict in Victorian times that the criminal underworld developed—an outward appearance of dignity was valued more than genuine humanity. Utterson represents the perfect Victorian gentleman. He consistently seeks to preserve order and decorum, does not gossip, and guards his friends' reputations as though they were his own. There was some hypocrisy around the idea of the Victorian gentleman, as many of these men indulged their vices in poor areas so as not to be seen.
Science and Darwinism	Darwin gave the world his Theory of Evolution which suggested that perhaps we did not come from God, but evolved from apes. People were shocked at the thought that we might have something in common with these primate beasts. Scientific developments were rapid at this time, including in medicine. We knew more about anatomy than ever before. There was a growing conflict between religion and science. New beliefs such as phrenology led people to have unusual beliefs about what facial features/head shapes might mean about your personality and character.
Suppressing temptations	Victorians were religious and so feared what went on 'behind closed doors'. This included sexual desires and temptations. Homosexuality (illegal at the time) was often linked to blackmail as people sought to suppress their private desires.
Divided society	Stevenson grew up in Edinburgh and some think the city of London in J&H is actually based on Edinburgh. Both Edinburgh and London were divided cities—made up of areas of extreme wealth side by side with areas of extreme poverty. The co-existence of these two very different worlds interested Stevenson.
London	A dirty, smoggy, dark and dangerous city at the time of writing. Sometimes covered in a brown fog from the factories of the Industrial Revolution. Riddled with crime which went largely unsolved by a relatively new and ineffective police force.
Industrial Revolution	The building of factories drove mass migration of people from country to city to find work. Housing was crowded and low quality and it was a time of rapid social change. This led to fears of depravity and crime; Londoners were concerned about the pace of change. There was also a fear of new technology and its implications for mankind.

KEY QUOTATIONS

"Sinister block of buildings thrust forward its gable...blind forehead of discoloured wall"	"I incline to Cain's heresy. I let my brother go to the devil in his own way"	""shopfronts...like rows of smiling sales-women"
"...[Hyde] must have secrets of his own; black secrets, secrets compared to which poor Jekyll's worst would be like sunshine"	"I have seen devilish little of the man... unscientific balderdash" "he began to go wrong, wrong in the mind"	"Jekyll's main house: at the '"front" with an "air of wealth" Jekyll's laboratory: at the "back" with a "blistered and distained door".
"Like a madman" "Like a rat" "Like Satan"	"ape-like fury" "seems hardly human. Something troglodytic?" "radiance of a foul soul transpires through"	"fiend" "If I ever read Satan's signature on a face, it is on that of your new friend!"
"the fog slept on the wing above the drowned city" "like a district of some city in a nightmare"	"...you who have denied the virtue of transcendental medicine, you who have derided your superiors – behold!"	"I have been doomed to such a shipwreck: that man is not truly one, but truly two" "I am the chief of sinners. I am the chief of sufferers too"
"I looked upon that ugly idol in the glass, and was conscious of no repugnance, rather a leap of welcome"	"the moment I choose, I can be rid of Mr Hyde"	"something of a slyish cast perhaps, but every mark of kindness"
"The rosy man had become pale, his flesh had fallen away"	"expression of such abject terror and despair" "God forgive us!"	"I have had a shock and shall never recover"

WRITER'S METHODS

Method	Description
Pathetic fallacy	Used extensively to create a dark and mysterious mood and to create tension. London is often shrouded in fog which represents the central mystery in the novella—the characters cannot see clearly.
Contrasting imagery	Lexical fields related to hell/devil used to describe Hyde in contrast to Jekyll's good characteristics.
Characterisation	Lanyon's language is very factual. Whereas Jekyll's language is more metaphorical and poetic when he narrates his story at the end. This language difference shows the two differing ideas of science (L vs J)
Setting and symbolism	The house is a key symbol of the duality in Victorian society. Jekyll's house is symbol of man's respectable public face. Hyde's entrance and the laboratory represent the darker, hidden side of man. Consider windows as another symbol—the lack of windows/high windows indicating secrecy.
Narrative voice	Most of J&H is told by a third person narrator, but from the point of view of Utterson (third person limited). This means we find out the story as it is revealed to Utterson, keeping us waiting to find out the 'big reveal'. We do hear about certain events through other characters eg. The maid's description of the Carew murder. The two final chapters are told in first person—Chapter 9 is from Lanyon's perspective and Chapter 10 though Jekyll's. Consider why this might be. Lanyon's narrative contains letters—this is a key trope of Gothic fiction, along with multiple narratives and letters, documents etc.

FORM AND STYLE

Gothic fiction—this genre started in the 18th century and gained popularity in the 19th century. Features include pathetic fallacy, isolated settings, extremes of emotion eg, terror, passion. Usually includes terrifying, violent and supernatural events. Sometimes Gothic stories used different narratives to tell the story eg. Spoken accounts, diaries and other documents. This helps keep some parts of the narrative hidden and create more mystery. Gothic settings are dark and mysterious—just like London in this novella. Gothic novels were popular as they allowed Victorian readers to feel and experience terror in a safe, controlled way.

Detective novel—Made popular by Sherlock Holmes stories in 19th century, some elements are borrowed by Stevenson. Usually starts with a crime, which is solved during the course of the novella. It also includes a trail of false and true leads/clues. In J and H we know who committed the crime, but what we don't know is the connection between J and H. This is the central 'mystery' of the novella. The big 'reveal' isn't until Chapter 9—much like in detective fiction where the murderer is revealed at the end. Think about how Stevenson leads the reader down false lines of enquiry and leaves us a series of mysterious clues—like Utterson, we are in the dark and need to try to solve the mystery!

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Geography

Key term:	Definition:
Geology	Rock type
Relief	Height above sea level
Concordant	Coastline with one rock type
Discordant	Coastline with more than one rock type
Glaciation	Ice sheets dominating the landscape
Weathering	The wearing away of material due to the climate
Erosion	The wearing away of material due to force
Deposition	The creation of landforms due to the movement of material

1	SEDIMENTARY ROCKS CENOZOIC
2	MESOZOIC
3	LATE PALAEOZOIC
4	EARLY PALAEOZOIC
5	LATE PROTEROZOIC
6	METAMORPHIC ROCKS
7	IGNEOUS ROCKS

Processes:	Explanation:	Example:
Geology	There are three main rock types; igneous, metamorphic & sedimentary.	The UK is shaped by all three main rock types; the main rock type in the UK is a sedimentary rock e.g. most of Essex is shaped by "London Clay."
Glaciation	The UK was once dominated by glaciers which shaped the landscape over time. This has led to the formation of distinctive landscapes across the UK.	The Lake District in Cumbria and Snowdonia in Wales are examples of Glaciated valleys and are dominated by distinctive landforms e.g. U Shaped Valley.
Coastal landforms	The power of the sea has shaped the UK coastline over time. They have created distinctive landscapes due to the variety of geological profiles.	The UK coastline has a number of landforms of coastal erosion e.g. Bays & Headlands as well as landforms of coastal deposition such as beaches and sand spits e.g. Sandbanks in Dorset
Sub aerial processes	The climate will affect the wearing away of material in upland areas; this will create steep slopes. Movement will make its way to the earth's surface due to gravity in a process known as mass movement.	Sub aerial processes help shape upland areas (e.g. formation of a Corrie) as well as lowland areas (coastal erosion of boulder clay cliffs)
Engineering	The Government & the Environment Agency are in charge of preventing damage from both coastal erosion and river flooding.	Millions of pounds are spent annually to avoid river or coastal flooding e.g. sea walls or the Thames Flood Barrier in East London.

Geography

Key term:	Definition:
Drainage basin	An area of land drained by a river and its tributaries
Source	Origin of the river
Discharge	The amount of water in the river channel at any one point
Meander	A bend in the river
Confluence	The point at which the main and tributary river meet
River estuary	Widening and deepening of the river in the lower course
Mass movement	The movement of material to the earth's surface due to gravity
transportation	The transportation of material in the water

Processes:	Explanation:	Example:
Drainage basin	Every major river forms part of a drainage basin. A drainage basin is an area of land drained by a river and its tributaries. The characteristics of the river change from source to mouth.	The UK is shaped by a number of major rivers. The upper course of rivers is characterised by landforms of fluvial erosion e.g. V Shaped Valley.
Fluvial erosion	Weathering, mass movement and vertical erosion combine to alter the upland areas of the UK. They will lead to the formation of a V Shaped Valley or Waterfall.	V Shaped valleys can be found in National Parks such as the Brecon Beacons. The tallest waterfall in the UK is High Force Waterfall on the River Tees
Transportation	Eroded materials find their way into the river bed; this can increase vertical erosion through the process of abrasion. The river transports its load from upper to lower course.	Large stones roll along the river bed; this is known as traction. Smaller stones bounce along the river bed in a process known as saltation. Finer material is suspended in the water- this is known as suspension.
Fluvial deposition	The middle and lower course of the river is characterised by lateral erosion and deposition; the gentle gradient aids this change.	Meanders, ox bow lakes and levees are examples of fluvial deposition; examples can be found in the lower course of the River Severn.

United Kingdom Physical

Health and Social Care Knowledge Organiser: Component 2 Health and Social Care Services and Values

Learning Aim A: Understand the different types of health and social care services and barriers to accessing them	Learning Aim B: Demonstrate care values and review own practice

Providing good health and social care services is very important and a set of 'care values' exist to ensure this happens. Care values are important because they enable people who use health and social care services to get the care they need and to be protected from different sorts of harm.

A1 Health and social care services

1. Different health care services and how they meet service user needs
   a. Primary care, e.g. dental care, optometry, community health care
   b. Secondary & tertiary care, e.g. specialist medical care
   c. Allied health professionals, e.g. physiotherapy, occupational therapy, speech and language therapy, dieticians

2. Different social care services and how they meet service user needs
   a. Services for children and young people, e.g. foster care, residential care, youth work
   b. Services for adults or children with specific needs (learning disabilities, sensory impairments, long-term health issues) e.g. residential care, respite care, domiciliary care
   c. Services for older adults, e.g. residential care, domiciliary care
   d. Role of informal social care provided by relatives, friends and neighbours

B1 Care values

1. Empowering and promoting independence by involving individuals, where possible, in making choices
2. Respect for the individual by respecting service users' need, beliefs and identity
3. Maintaining confidentiality
4. Preserving the dignity of individuals to help them maintain privacy and self-respect
5. Effective communication that displays empathy and warmth
6. Safeguarding and duty of care
7. Promoting anti-discriminatory practice by being aware of types of unfair discrimination and avoiding discriminatory behaviour

A2 Barriers to accessing services

1. Types of barriers and how they can be overcome by the service providers and users
   a. Physical barriers, e.g. issues getting into and around the facilities
   b. Sensory barriers, e.g. hearing and visual difficulties
   c. Social, cultural and psychological barriers, e.g. lack of awareness, differing cultural beliefs, social stigma, fear of loss of independence
   d. Language barriers, e.g. differing first language, language impairments
   e. Geographical barriers, e.g. distance of provider, poor transport links
   f. Intellectual barriers, e.g. learning difficulties
   g. Resource barriers for service provider, e.g. staff shortages, lack of local funding, high local demand
   h. Financial barriers, e.g. charging for services, cost of transport, loss of income while accessing services

B2 Reviewing own application of care values

1. Key aspects of a review
   a. Identifying own strengths and areas for improvement against the care values
   b. Receiving feedback from teacher or service user about own performance
   c. Responding to feedback and identifying ways to improve own performance

STRENGTHS   WEAKNESSES   OPPORTUNITIES   THREATS

S W O T

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History

	Causes of illnesses	Prevention and Treatment	Individuals
Paper 1: Medicine in Britain **Medicine in Britain: c1250-presemt.** **Medieval England** **1250-1500**	**Religious:** Belief that God caused illnesses. **Supernatural:** Astrology also used to help diagnose illnesses. **Rational:** Four Humours Theory: Body made of four liquids (blood, phlegm, black and yellow bile). Imbalance of these humours can cause illness and disease. **Hippocrates** **Miasma:** Belief that bad air was harmful and cause illnesses.	**Supernatural treatments:** Praying, fasting + Pilgrimages. **Rational treatments:** Bloodletting, leeches + purging. Herbal remedies also used to treat the sick. Medieval people also encouraged to take care of their bodies – exercise, sleeping and keeping clean. **Physician:** Diagnosed illnesses and suggested treatments. Studied patients' blood and urine. **Apothecary:** Mixed herbal remedies. **Barber Surgeon:** Performed simple surgery. **Hospitals:** Owned and run by the Church. **Home:** Majority of sick cared for at home (women).	**Hippocrates:** Four Humours Theory. + = Observed patients/recorded symptoms + Hippocratic Oath. - = Ideas on causes of disease were wrong. **Galen:** Theory of Opposites. + = Wrote over 350 books on medicine. - = Made mistakes – Jaw bone made of 1 bone not 2. **Case Study: Black Death (1348)** **Causes:** Sent by God as punishment, bad air that corrupted the body's four humours. **Treatment:** Prayer, charms, bleeding and purging, sniffing strong herbs, and fires lit to remove bad air. **Prevention:** Pray to God, Flagellants + streets cleaned.
	Key Words	**Key Words**	**Key Words**
	Diagnosis: Identify illness based on symptoms. **Miasma:** Bad air that believed to cause diseases. **Physician:** Qualified person to practice medicine. **Rational:** Idea based on logic. **Supernatural:** Ideas not explained by science/nature.	**Bloodletting:** Drawing blood from the sick. **Herbal Remedy:** Medicine made from plants/herbs. **Pilgrimage:** Journey to sacred place. **Purging:** Removing humours from the body. **Purifying the air:** Removing foul smells from the air. **Regimen sanitatis:** Instructions to help treat the sick.	**Bubonic Plague:** Disease spread by bacteria (sneezing). **Flagellants:** People who whipped themselves to ask for God's forgiveness to avoid plague. **Quarantine:** Separating sick to stop spread of disease.
	Causes of illnesses	**Prevention and Treatment**	**Individuals**
Renaissance England **1500-1700**	**Continuities:** Miasma Theory, influence of Church during epidemics and that supernatural beliefs. **Changes:** Most accepted that illnesses were not sent by God, decline of importance regarding the Four Humours Theory and analysis of urine. There was a move away from old ideas about the causes of illness but they had not been replaced!	**Continuities:** Bloodletting, herbal remedies, removal of bad air, use of apothecaries + surgeons for the poor and role of women caring for the sick who could not go to hospitals. **Changes:** People looked for chemical cures for diseases, Renaissance hospitals began to treat people with wounds and infectious diseases and Pest Houses.	**Thomas Sydenham:** 'English Hippocrates'. + = Placed importance on observing a patient. - = Doctors/physicians still reliant on Galen's work. **Vesalius:** 'On the Fabric of the Human Body'. + = Corrected 300 mistakes by Galen on anatomy. - = Caused controversy by challenging Galen's work. **William Harvey:** Circulation of the blood. + = Proved that arteries and vein were linked together. - = Considered to be mad as challenged Galen's work.
	Key Words	**Key Words**	**Case Study: Great Plague (1665)**
	Epidemic: Disease that spreads quickly. **Printing Press:** Machine for printing text/pictures. **Renaissance:** Revival of ideas from 1500-1700. **Royal Society:** Set up in 1660 to discuss new ideas in medicine and science. Sponsored scientists.	**Pomander:** Ball containing perfumed substances. **Transference:** Belief that an illness can be transferred to something else. **Pest House:** Hospitals that specialised in one disease.	**Causes:** Unusual alignment of the plants, sent by God as punishment, imbalance of Four Humours + Miasma. **Treatment:** Prayer, quarantine, fasting, smoking tobacco to ward off miasma + Plague Doctors. **Prevention:** Local governments tried the following: banning public meetings, closing theatres, sweeping the streets, burring barrels of tar and sweet smelling herbs to ward off miasma, killing cats and dogs.

Industrial Britain 1700-1900

Causes of illnesses	Prevention and Treatment	Individuals
Continuities: Miasma Theory, influence of Church during epidemics and that supernatural beliefs. **Changes:** Germ Theory (1861) disproved Spontaneous Generation Theory and believed that germs cause disease in human body. **Pasteur/Koch.**	**Hospital Care:** c18 Hospitals were dirty, overcrowded and in poor conditions. **Nightingale.** **Surgery:** c18 surgery was dangerous, problem of pain, infection and bleeding. **Simpson/Lister.** **Vaccinations:** c18 Smallpox massive killer. **Jenner.** **Cholera:** Epidemics in 1831, 1848-9 and 1854. **Snow.** **Public Health Act - 1848:** Not compulsory + no change. **Great Stink-1858:** Introductions of sewers. **Bazalgette.** **Public Health Act: 1875:** Compullsory and forced authorities to provide clean drinking water, build public toilets and dispose of sewage to avoid pollution.	**Louis Pasteur:** Germ Theory (1861). + = Identified that germs cause disease and illnesses. - = Unable to identify specific germs. **Robert Koch:** Microbes (1867). + = Discovered microbes cause specific illnesses. - = Took time for his work to be widely accepted. **Florence Nightingale:** *'Notes on Nursing' (1859).* + = Improved conditions in hospitals. - = Had to fight hard in order to change attitudes. **James Simpson:** Chloroform as an anaesthetic (1847). + = Provided safer alternative to Laughing Gas + Ether. - = Difficultly in gauging correct dose to be used.

Key Words	Key Words	Individuals (cont.)
Englightenment: Focus on change than continuity. **Germ Theory:** Theory that Germs cause disease. **Microbes:** Living organism that can only be seen under a microscope. **Spontaneous Generation Theory:** Belief that microbes are released when things decay, rather than being the cause and that they are spread by miasama.	**Anaesthetic:** Used to make someone unconcious. **Antiseptic surgery:** Killing bacteria before operations. **Aseptic surgery:** Operation that takes place in a strictly controlled germ-free environment. **Inoculation:** Deliberately infecting a patient with a disease in order to become immune to it. **Vaccination:** Injection of weakneed organisms to give body resistance against disease. **Great Stink:** Exposed sewage on the River Thomas created awful smell near Houses of Parliament. **Laissez-Faire:** Government's attitude that it should not interfere with matters relating to Public Health.	**Joseph Lister:** Carbolic Acid as an antiseptic (1865). + = Antiseptic surgery – killing germs from wounds. - = Opposed because of poor knowledge Germ Theory. **Edward Jenner:** Vaccination. + = Discovered vaccination for Smallpox (1796). - = Vaccination not compulsory until 1852 by state. **John Snow:** Discovered cause of Cholera (1848). + = Concluded it caused by dirty drinking water. - = Government unwilling to pay for improvements. **Joseph Bazalgette:** Introduced Sewer system (1865). + = Built over 1300 sewers in London. - = Size of project took time until completed in 1875.

Modern Britain 1900-present

Causes of illnesses	Prevention and Treatment	Individuals
By 1900, scientists realised not all diseases were caused by microbes. Discovery of DNA (1953) meant scientists understood how hereditary diseases were caused. E.g. Down's Syndrone. **Crick and Watson.** **Lifestyle choices impact on health:** smoking, poor diet, alcohol, sharing of bodily fluids and exposure to excessive amounts of sun. **Improvements in diagnosis:** X-ray, CT/MRI scans, ultrasound, Blood testing and pressure monitor.	**Magic Bullets:** Salvarson 606. **Paul Ehrlich.** **Antibiotics:** Pencillin discovered in 1928. **Alex Fleming.** Mass produced for D-Day in 1944. **Florey and Chain.** **High-tech medical/surgical treatement:** Dialysis, Prosthetic limbs, Keyhole surgery, ECG, Endoscope. **Changes in care/treatment:** NHS: Hospitals, GP's, dentists, ambulance services + health visitors. **Government lifestyle campaigns:** *Change4life* + campaigns warning of dangers of drug/binge drinking.	**Crick and Watson:** Discovered DNA (1953). + = Scientists explore causes of hereditary diseases. - = Doctors still unable to treat genetic conditions. **Paul Ehrlich:** Created first Magic Bullet (1909). + = Discovered Salvarson 606 to treat Syphilis. - = Magic Bullet can only treat one specific disease. **Alexander Fleming:** Discovered Penicillin (1928). + = Noticed 'white mould' killed bacteria - Penicillin. - = Unable to fund further research + went no further.

Key Words	Key Words	Individuals (cont.)
DNA: Carries genetic information about a living organism. **Genome:** Each human being has a unique DNA. **Human Genome Project:** Scientists worked to decode and map out the human genome. **Hereditary diseases:** Diseases that are passed down from one generation to another.	**Antibiotic:** Medicine that destroys the growth of bacteria inside the body. **D-Day:** Allied forces in WW2 invade northern France. **Magic Bullet:** Chemical that kills specific bacteria in the body. **General Practitioner:** Community-based doctor who treats minor illnesses.	**Florey and Chain:** Mass produced Penicillin (1944). + = Developed Penicillin and mass produced it. - = Reliance of USA for funding. **Fight against Lung Cancer:** **Diagnosis:** Difficult to diagnose early on. **Treatment:** Transplants, radio/chemotherapy. **Prevention:** Smoking banned in public places, raising age of buying cigarettes and stop smoking campaigns.

Paper 1: Section A The British Sector of the Western Front, 1914 – 1918.	Context of the British sector of the Western Front		Conditions requiring treatment on the Western Front

Context of the British sector of the Western Front

The Ypres Salient: Germans had the advantage with being on the higher ground. Tunnelling and mines were used by the British at Hill 60. First Battle of Ypres - 1914. Second Battle of Ypres -1915. Third Battle of Ypres - 1917.	**The Somme:** Battle of the Somme - July-November 1917. 1st day of battle, 60,000 casualties and 20,000 died. In total, 400,000 Allied casualties and this put pressure on medical services on the Western Front.
Arras: Battle of Arras - 1917. Before the battle, Allied soldiers dug tunnels below Arras. Tunnels led to rooms and included an underground hospital.	**Cambrai:** Battle of Cambrai -1917. 450 tanks used to advance on the German position, however, plan did not work because there was not enough infantry to support.

Impact of terrain on helping the wounded: Difficult to move around, + night, communication was difficult, collecting wounded from No Man's Land was dangerous. Stretcher bearers found it difficult to move around corners and transport of the wounded was difficult because of this.

Key words

No Man's Land: Land between Allied and German trenches in WW1.
Trenches: Long, narrow ditches dug during the First World War.
Ypres Salient: Area around Ypres where many battles took place in WW1.

Conditions requiring treatment on the Western Front

Ill health: Trench fever: caused by body lice and included flu-like symptoms including high temperature. **Treatment:** Passing electric current through infected area was effective. **Prevention:** Clothes disinfected and delousing stations were set up. Affected 0.5 million.
Trench foot: caused by soldiers standing in mud/waterlogged trenches. **Treatment:** soldiers advised to keep clean but worst cases, amputation. **Prevention:** Changing socks + keeping feet dry and rubbing whale oil into feet. Affected 20,000 in winter of 1914-1915.
Shell-shock: caused by stressful conditions of war and symptoms included tiredness, nightmares, headaches and uncontrollable shacking. **Treatment:** Not well understood. **Prevention:** rest and some received treatment in UK. Affected 80,000 and some were shot!
Weapons of war: Rifles: fired one at a time/loaded from cartridge case creating rapid fire.
Machine guns: Fired 500 rounds a minute. Pierced organs and fracture bones.
Artillery: Bombardments were continuous, Artillery fire caused half of all causalities.
Shrapnel: Caused maximum damage exploded mid-air above enemy. Killed/injured.
Chlorine Gas: Led to death by suffocation. 1915, gas masks given to all British soldiers.
Phosgene Gas: Faster acting than Chlorine but with similar effects. Could kill within 2 days.
Mustard Gas: Odourless gas, worked in 12 hours. Caused blisters, burn the skin easily.

Key words

Gangrene: When a body decomposes due to a loss of bloody supply.
Shrapnel: A hollow shell filled with steel balls or lead, with gunpowder and a time fuse.

Helping the wounded on the Western Front

Evacuation route: Survival depended on speed of treatment. Care improved as war progressed. 1914 – 0 motor ambulances but by 1915, it was 250. Ambulance trains were introduced, as well as, ambulance barges used along River Somme.
Stretcher bearers: Collect wounded, 16 in each battalion + 4 for each stretcher.
Regimental Aid Post: Always close to the front line and staffed by a Medical officer selected those who were lightly wounded/needed more attention.
Field Ambulance and Dressing Station: Emergency treatment for wounded.
Casualty Clearing Station: Large, well equipped station, 10 miles from trenches.
Base Hospitals: X-ray, operating theatre and areas to deal with gas poisoning.
Underground hospital at Arras: Running water, 700 beds and operating theatre.
RAMC: Involved medical officers and learnt about wounds never seen before.
FANY: Volunteer nurses, who helped the wounded and also drove ambulances.

Key words

FANY: First Aid Nursing Yeomanry. Founded in 1907 by a soldier who hoped they would be a nursing cavalry to help the wounded in battle.
RAMC: Royal Army Medical Corps. This organisation organised and provided medical care. It consisted of all ranks from doctors to ambulance drivers and stretcher bearers.
Triage: A system of splitting the wounded into groups according to who needed the most urgent attention.

The impact of the Western Front on Medicine

The Thomas Splint: Stopped joints moving and increased survival rates from 20 to 82%. Reduced infection from compound fractures.
X-rays: Developed in 1895, X-rays used to diagnose issues before operations. But there were some problems: X-ray could not detect all problems, were fragile and overheat.
Mobile X-rays: 6 operated on the front line, used to locate shrapnel and bullet wounds. Transported around in a truck and enabled soldiers to be treated more quickly.
Blood Transfusions: Blood loss = major problem. Blood transfusions used at Base Hospitals by a syringe and tube to transfer blood from patient to donor. Extended to CCS from 1917.
Blood bank at Cambrai: Adding Sodium Citrate allowed blood to be stored for longer. Blood was stored in glass bottles at a blood bank and used to treat wounded soldiers.
Brain surgery: Magnets used to remove metal fragments from the brain. Local anaesthetic.
Plastic surgery: Harold Gillies developed new techniques, skin drafts developed for grafts.

Key words

Compound Fracture: Broken bones pierces the skin + increases risk of infection in wound.
Debridement: Cutting away of dead and infected tissue from around the wound.
Gas Gangrene: Infection that produced gas in gangrenous wounds.
Mobile X-ray unit: Portable X-ray unit that could be moved around the Western Front.
Radiology department: Hospital department where X-rays are carried out.
Blood transfusions: Blood taken from a healthy person and given to another person.
General anaesthetic: Putting a patient to sleep during an operation.
Local anaesthetic: Area being operated on is numbed to prevent pain + patient awake.

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AC2.1.1 Nutrition: Describe functions of nutrients in the human body.

The Eatwell Guide

The Eatwell Guide is the UK Healthy Eating Model. It shows what we should eat as a balanced diet. The size of the sections represents the proportion of our diet that particular food group should make up. The Eatwell Guide was updated in 2016 to take into account scientific opinion and public opinion. The main change was that sugary and fatty foods are shown off the plate as they are not part of a healthy diet.

Water makes up just over 2/3 of the human body and is required for:
- Maintain body temperature
- Metabolise fat
- Aid digestion
- Lubricate organs
- Transport nutrients
- Flushes out waste and toxins

6-8 a day

The Eatwell Guide

Fruits & Vegetables
- Eat 5 portions a day!
- Choose a variety
- Provides fibre for healthy digestion
- Provides vitamins and minerals for healthy body functions and immune system

40%

Fatty and Sugary Foods
- These are the danger foods!
- They are not part of a healthy diet
- Eat them only occasionally
- Eating too much fatty and sugary processed food is linked to increased risk of weight gain/obesity, diabetes, tooth decay and cardiovascular

0%

8 Tips for healthy eating
1. Eat more fibre
2. Eat more fruits and Vegetables
3. Eat more oily fish
4. Eat less salt
5. Eat less fat
6. Eat less sugar
7. Choose wholegrains
8. Drink 6-8 glasses of water per day

Starchy Foods
- Provide slow release carbohydrate used by the body for energy
- Choose whole grains for increased fibre (good digestion, reduced risk of heart disease)

Eatwell Guide

Beans, Pulses, Eggs, Meat, Fish
- Provide protein for growth, repair and maintenance of body cells
- Choose a combination of plant proteins
- Avoid eating too much processed meat like bacon and sausages as these are linked with increased risk of bowel and stomach cancer

12%

Soluble fibre dissolves in water and the insoluble kind doesn't.
Soluble fibre helps reduce blood cholesterol and sugar.

Insoluble fibre helps absorb water and bulk up stools. It does not dissolve in water.

Water Intake
A balanced diet must include water, it is required for nearly all brain and other bodily functions.

Oils & Spreads
Provide fat so... vitamins A,D,E & K
Are high in calories & energy so keep use to a minimum
It is recommended to choose unsaturated oils like olive oil.

1%

Dairy Foods
- Provide calcium for healthy bones, teeth and nails
- The body needs Vitamin D to absorb calcium effectively

8%

Fibre in the diet

Water rich foods

96% water

90% water

94% water

92% water

95% water

95% water

89% water

89% water

PORTION SIZES:
Healthy diets not only have the correct balance, but have the right portion sizes. Here is a 'handy' guide ...
YOUR HAND IS YOUR PORTIONING TOOL

A serving of protein = 1 palm

A serving of vegetables = 1 fist

A serving of carbs = 1 cupped hand

A serving of fats = 1 thumb

AC2.1.1 Nutrition: Describe functions of nutrients in the human body.

Water Soluble Vitamins

A vitamin that can dissolve in water. Vitamins are nutrients that the body needs in small amounts to stay healthy and work the way it should. Water-soluble vitamins are carried to the body's tissues but **are not stored in the body.**

	Water Soluble Vitamin	Needed For	Found In	Deficiency/Excess
MICRONUTRIENTS	**C** Antioxidant Adults aged 19 to 64 need 40mg of vitamin C per day.	• helping to protect cells and keeping them healthy • maintaining healthy skin, blood vessels, bones and cartilage • helping with wound healing	• citrus fruit, such as oranges and orange juice • peppers • strawberries • blackcurrants • broccoli • brussels sprouts • potatoes	Deficiency - Scurvy, very rare symptoms include bleeding gums, wounds not healing properly, tiredness. Lack of vitamin C effects absorption of iron. Excess Taking large amounts (more than 1,000 mg per day) of vitamin C can cause: • stomach pain • diarrhoea • Flatulence Vitamin C is water soluble so excess can easily be excreted by the body.
	B1 Thiamin Adults aged 19 to 64 need: 1mg men 0.8mg women	• helps the body break down and release energy from food • keep the nervous system healthy	• peas • some fresh fruits (such as bananas and oranges) • nuts • Whole grain breads • some fortified breakfast cereals • liver	Deficiency - Beri-beri (disorder of the nervous system). Excess - body excretes it.
	B2 Riboflavin Adults aged 19 to 64 need: 1.3mg men 1.1mg women	• keep skin, eyes and the nervous system healthy • release energy from food	• milk • eggs • fortified breakfast cereals • mushrooms • plain yoghurt UV light can destroy riboflavin, so these foods should be kept out of direct sunlight.	Deficiency - Dry cracked skin around the mouth and nose. Excess - body excretes it.
	B3 Niacin Adults aged 19 to 64 need: 16.5mg men 13.2mg women	• release energy from food • keep the nervous system and skin healthy	• meat • fish • wheat flour • eggs Niacin cannot be stored in the body, so you need it in your diet every day.	Deficiency - disease pellagra. Symptoms can include dermatitis, dementia and diarrhea. Excess - body excretes it.
	B9 Folate Adults aged 19 to 64 need: 200mcg In pregnancy: 400mcg	• form healthy red blood cells • reduce the risk of birth defects called neural tube defects, such as spina bifida, in unborn babies	• broccoli • Brussels sprouts • leafy green vegetables, such as cabbage, kale, spring greens and spinach • peas • chickpeas and kidney beans • liver (but avoid this during pregnancy) • breakfast cereals fortified with folic acid	Deficiency - can lead to folate deficiency anaemia. Symptoms can include insomnia, depression and forgetfulness. Excess - Taking doses of folic acid higher than 1mg can mask the symptoms of vitamin B12 deficiency, which can eventually damage the nervous system if it's not spotted and treated. This is particularly a concern for older people because it becomes more difficult to absorb vitamin B12 as you get older.
	B12 Cobalamin Adults aged 19 to 64 need: 1.5mcg	• make red blood cells and keeping the nervous system healthy • release energy from food • use folate	• meat • fish • milk • cheese • eggs • some fortified breakfast cereals	Deficiency - If you eat meat, fish or dairy foods, you should be able to get enough vitamin B12 from your diet. Vitamin B12 is not found naturally in foods such as fruit, vegetables and grains, vegans may not get enough of it. Excess - body excretes it.

AC2.1.1 Nutrition: Describe functions of nutrients in the human body.

Fat Soluble Vitamins

Click here for video

A vitamin that can dissolve in fats and oils. Vitamins are nutrients that the body needs in small amounts to stay healthy and work the way it should. Fat-soluble vitamins are absorbed along with fats in the diet and are stored in the body's fatty tissue and in the liver.

Key Words

Deficiency	A shortage of a substance (such as a vitamin or mineral) needed by the body.
Absorb	Nutrients are taken into the body and (absorbed) and transported by the bloodstream to other parts of the body for use or storage.

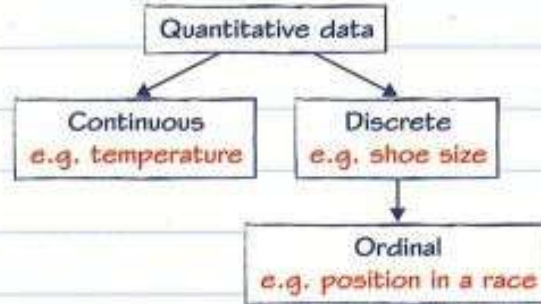|	Fat Soluble Vitamin	Needed For	Found In	Deficiency/Excess
MICRONUTRIENTS	**A** Adults aged 19 to 64 need (per day): 700 mcg men 600mcg women	• helping your body's natural defence against illness and infection (the immune system) work properly • helping vision in dim light • keeping skin and the lining of some parts of the body, such as the nose, healthy	• cheese • eggs • oily fish • fortified low-fat spreads • milk and yoghurt • liver and liver products such as liver pâté Liver is a particularly rich source of vitamin A, so you may be at risk of having too much vitamin A if you have it more than once a week (pregnant women should avoid eating liver or liver products).	**Deficiency** – Night blindness. Xerophthalmia the eyes may become very dry and crusted, which may damage the cornea and retina. Frequent skin irritations. **Excess** Having more than an average of 1.5 mg (1,500 µg) a day of vitamin A over many years may affect your bones, making them more likely to fracture when you're older. This is particularly important for **older people, especially women**, who are already at increased risk of osteoporosis, a condition that weakens bones.
	Beta-Carotene	You can also get vitamin A by including good sources of beta-carotene in your diet, as the body can convert this into retinol.	• yellow, red and green (leafy) vegetables, such as spinach, carrots, sweet potatoes and red peppers • yellow fruit, such as mango, papaya and apricots	
	D Adults aged 19 to 64 need: 10 mcg per day	• keep bones, teeth and muscles healthy.	• oily fish – such as salmon, sardines, herring and mackerel • red meat • liver • egg yolks • fortified foods – such as some fat spreads and breakfast cereals	**Deficiency** - A lack of vitamin D can lead to bone deformities such as rickets in children, and bone pain caused by a condition called osteomalacia in adults. **Excess** - Taking too vitamin D over a long period of time can cause too much calcium to build up in the body (hypercalcaemia). This can weaken the bones and damage the kidneys and the heart.
	E Adults aged 19 to 64 need: 4mg men 3mg women	• helps maintain healthy skin and eyes and strengthen the body's natural defence against illness and infection (the immune system).	• plant oils – such as rapeseed (vegetable oil), sunflower, soya, corn and olive oil • nuts and seeds • wheatgerm – found in cereals and cereal product	**Deficiency** - Any vitamin E your body does not need immediately is stored for future use, so you do not need it in your diet every day. **Excess** - N/A
	K Adults aged 19 to 64 need: 1 microgram per kg of body weight.	• a group of vitamins that the body needs for blood clotting, helping wounds to heal.	• green leafy vegetables – such as broccoli and spinach • vegetable oils • cereal grains • small amounts can be found in meat and dairy foods.	**Deficiency** - Taking 1mg or less of vitamin K supplements a day is unlikely to cause any harm. **Excess** - Rare, however vitamin K can interact with several common medications, including blood-thinners, anticonvulsants, antibiotics, cholesterol-lowering drugs, and weight-loss drugs.

AC2.1.1 Nutrition: Describe functions of nutrients in the human body.

Function of Nutrients in the Body

Hospitality and Catering

	Nutrient	Types	Function	Effects too little (deficiency)	Effect of too much (excess)
MACRONUTRIENTS	**Carbohydrates** 4 kcal per gram [Click here for video]	Starches (complex): found in cereal grains such as rice, wheat, oats, plus starchy tubers (potatoes and sweet potatoes) and vegetables (carrots, beets, corn). Digest slowly, long lasting energy. ✓ Sugars (simple): lactose found in milk and dairy, fructose found in honey, fruits and some vegetables (peppers, tomatoes). Digest and enter the bloodstream quickly for a burst of energy. ✗	Carbohydrate is the body's main source of energy (fuel). Carbohydrate breaks down to glucose, which is the only form of energy the brain recognises. Basically, without carbohydrate, your brain wouldn't function! All carbohydrates, no matter what type, provide **4kcal of energy per gram**. The difference is complex carbs take longer to break down and therefore satisfy hunger for longer, whereas simple sugars leave you feeling empty and wanting more. Complex carbs provide dietary bulk and fibre which makes us feel fuller for longer. Dietary fibre: complex carbohydrate found in the cell wall of fruits, vegetables and cereals. Aids with removal of waste from the body.	Deficiency of carbohydrates is extremely rare in the UK as we have good access to carbohydrate rich foods. Long term lack of carbohydrates in the diet can cause ketosis – a condition where the body switches to using protein as an energy source. Visible symptoms: Lack of energy and weight loss. Non-visible symptoms: Not enough fibre from whole grains foods leads to constipation and other intestinal/bowel problems.	If not used for energy, excess carbohydrates are converted to glycogen and stored in the muscles and liver. Visible symptoms: Weight gain and obesity. Non-visible: Eating too much non-refined (white) carbohydrates leads to tooth decay, raised blood sugar levels and increased risk of developing type 2 diabetes. (See carbohydrates and glycemic index slides 7-8).
	Proteins 4 kcal per gram [Click here for video]	High Biological Value (HBV) protein: Meat, fish, poultry, dairy foods (milk), eggs, soya. Contain all the essential amino acids the body cannot make itself. ✓ Low Biological Value (LBV) protein: Quorn, Tofu, peas, beans, lentils, nuts, seeds and cereals. Missing one or more of the essential amino acids. Mainly come from plant sources. ✓ Two or more LBV proteins can be combined to make a complete protein. This is called protein complementation. Example: beans on toast.	Protein is digested by the body into its component parts – called amino acids. There are 8 which are essential for adults and 10 for children. Protein is essential for the growth, maintenance and repair of body tissue. Protein is part of every living cell and some tissues like skin, muscle, hair and the core of bones and teeth!	Visible symptoms: • Wasting of muscle & muscle loss • Oedema – build up of fluids in the body • Slow growth in children Severe deficiency leads to kwashiorkor (bloating of the stomach). Non-visible symptoms: Weaker immune system, as it needs protein to function properly. This can lead to prolonged recovery from illness or getting ill more frequently.	Visible symptoms: Excess stored as fat, which can lead to weight gain and obesity. Non-visible symptoms: Increased protein consumption leads to hyperfiltration – a state in which the kidney faces increased pressure in order to filter and remove waste from the body. Over the long term, hyperfiltration may lead to kidney damage.
	Fats 9 kcal per gram [Click here for video] [Click here for info]	Monounsaturated Fat: Avocado, many nuts and seeds, olive oil, almond oil, sunflower oil. Polyunsaturated Fat: Vegetable oil, corn oil, safflower oil, nuts, oily fish. ✓ Saturated Fat: Mainly from animal sources. Meat, butter, cream, eggs. ✓ Omega 3, 6 and 9 Fatty Acids: ✗ Oily fish, seeds and oils, flax seeds, pumpkin seeds, walnuts, soya beans, dark green vegetables, vegetable oils, margarines (polyunsaturated). ✓	• Protection of internal organs • Thermoregulation (temperature control) • Insulation of nerve cells (conduct electrical messages) • Uptake of fat soluble vitamins (A, D, E & K) • Growth, development and repair of body tissues • In women, storage and modification of reproductive hormones (oestrogen) • Forms a vital part of cell membranes • Supports mental health • Improves heart health • Supports health weight management • Shown to reduce inflammation • Supports infant brain development • Promotes brain health	Visible symptoms: Weight loss over time as the body uses stores of fat. Person feels cold as fat under skin acts as insulator. Non-visible symptoms: Bruising of the bones as they are not protected. Lack of fat in the diet can lead to deficiencies of fat soluble vitamins A, D, E & K. Fat deficiency can also lead to impaired in fertility in women due to anovulation. *Anovulation – happens when an egg (ovum) doesn't release from the ovary during the menstrual cycle. An egg is needed to have a pregnancy.	Common issue in the UK: Over consuming foods high in fat can raise the blood cholesterol levels (fat in the blood). Cholesterol is a fatty substance that is needed for the body to function properly, however there are two types, LDL (bad) and HDL (good). LDL cholesterol comes from saturated fats, such as meat and cheese. Eating too much saturated fat can lead to obesity and higher 'bad' cholesterol levels as well as an increased risk of developing type 2 diabetes and heart disease. Unsaturated plant sources of fats are much healthier for us.

Statistics

Quantitative data

Quantitative data

Continuous
e.g. temperature

Discrete
e.g. shoe size

Ordinal
e.g. position in a race

Qualitative data

Qualitative data are measures of types. Variables can be sorted into categories and are called **categorical data**. Categorical data is always qualitative. For example, raw data collected on where people went on holiday last year could be classed by continent: Europe, Asia, North America, South America, Africa, Australia and Antarctica.

Related data

Bivariate data involves **pairs** of related data values, such as exam results and time spent on study. **Multivariate data** involves sets of **three or more** related data values, such as age, height and weight.

Primary data

Primary data is information that you collect yourself.

You could do an experiment, carry out a survey or use a questionnaire to collect primary data.

Secondary data

Secondary data comes from published sources, such as newspapers, books or the internet.

You could take information from a table in a magazine to collect secondary data.

Populations

Maths

Technical words and phrases

You need to know these definitions:

A **population** is everything or everybody that could possibly be involved in an investigation, e.g. students in a school, all the people who use the local gym.

A **census** gathers data from the whole population.

A **sample** gathers data from some of the population.

A **representative sample** should contain all the characteristics of the population to avoid **bias**. A sample that is too small may not represent the population and may bias the results.

The **sampling units** are the people or items that are to be sampled.

A **sampling frame** is a list of all the members of the population from which the sample will be taken.

A **pilot survey** is a small sample analysed first before any large-scale samples.

A **pre-test** is a pilot where questions for a questionnaire are usually tried out.

Census vs sample

Here is a population.

A census would gather information from **everyone**.

All the members of the population can be numbered to form a **sampling frame**.

A **representative sample** is shown in red.

A census collects more information than a sample but takes a lot longer and is a lot more expensive.

Good and poor samples

Good samples	Poor samples
are as large as possible	are too small
are representative	are biased – they unfairly favour one set of values
have a suitable sampling frame	have a poor sampling frame (e.g. out of date, people missing, people counted twice, names on a list that shouldn't be there)

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A **random sample** is one in which every member of the population has an **equal chance** of being selected. A random sample is fair or **unbiased** and, if it is large enough, it is more likely to be **representative** of the population.

Methods for random sampling

Give each item in your sampling frame a unique number. To select the numbers for the items in your sample, you can:

- use a random number table
- use a random number generator on a computer or calculator
- put the numbers of the items on pieces of paper and select at random from a hat
- roll sets of fair 10-sided dice to generate digits from 0 to 9.

Maths

Non-random sampling

You need to know about these methods of **non-random sampling**.

1 **Judgement sampling** uses judgement to select a sample that is representative of the population.

2 **Opportunity sampling** uses the people (or objects) that are available at the time.

3 **Cluster sampling** can be used when the population is in groups. A random sample of these groups is selected and all items in the selected groups are included in the sample.

4 **Quota sampling** involves splitting the population into groups with certain characteristics (e.g. age, gender) and selecting a given number from each group. For example, a market researcher might ask 10 adults and 10 children about their reaction to the 2018 GCSE results.

5 In **systematic sampling**, items are selected from the population at regular intervals either in time or in space. For example, every 5th car that passes a location or every 3rd house on a street.

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Maths

Stratified sampling can be used when the population can be split into distinct **groups**. The advantage over simple random sampling is that you can be certain that all the groups are represented in the sample. This may not be true for simple random sampling.

Petersen capture-recapture formula

You can use the **Petersen capture-recapture formula** to estimate population size for large populations. The diagrams below show how this method works on a population of fish.

Using the formula

You can use this formula to estimate the population size, N:

$$N = \frac{Mn}{m} \text{ or } \frac{m}{n} = \frac{M}{N}$$

LEARN IT!

M = number of fish marked then released
n = size of recapture sample
m = number of marked fish in recapture sample

Assumptions

Learn the underlying assumptions.

✓ The population is closed – no migration.

✓ All members of the population are equally likely to be captured in each sample.

✓ Capture and marking do not affect catchability and markings are not lost.

✓ The population does not change due to deaths or births between sampling occasions.

✓ The sample is large enough to be representative of the population.

Strata

A **stratum** is a group in the population. In a stratified sample, the relative sizes of the groups in the sample are the same as their relative sizes in the whole population.

There are twice as many boys as girls in this population.

Girls   Boys
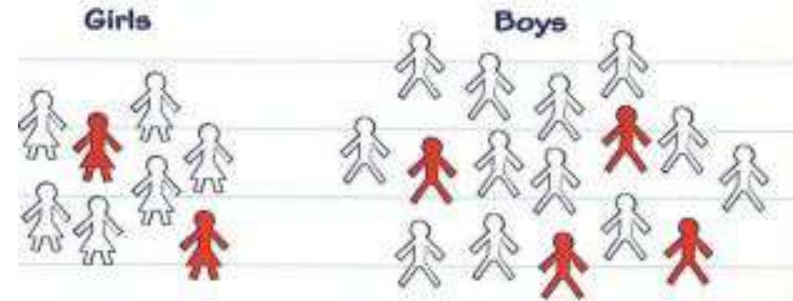
So you need twice as many boys as girls in the stratified sample (shown in red).

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Statistics

A **questionnaire** is a set of questions designed to collect primary data.
The person who completes the questionnaire is called the **respondent**.
Questionnaires are given to people to complete anonymously, either printed or online.
Interviews are usually carried out in person or by telephone.

	Advantages	Disadvantages
Questionnaires	• Much cheaper to do • Each person answering the question is treated in the same way	• Can be inflexible • People may misunderstand some questions
Interviews	• Interviewer can explain complex questions • Interviewer can follow up on unclear responses	• Interviewer may be biased • Can be costly

Golden rules

Remember these rules for designing questionnaires:

✓ Make questions clear and closed.

✓ Avoid open questions.

✓ Don't ask leading questions.

✓ Have response boxes which are unambiguous.

✓ Have response boxes which cover all possible replies and don't overlap.

Types of questions

Avoid **open** questions which allow a wide variety of responses.

e.g. 'What do you think about programmes on TV?'

Use **closed** questions to restrict the replies given.

e.g. 'Are you over 18 years old?'

Avoid **leading or biased questions** which might **lead** the respondent towards the answer that you want or expect.

Pilot surveys

Pilot surveys are used to test questions in a questionnaire, to make sure that respondents understand the questions and can answer in ways that will collect all the data needed and give valid results. Pilot surveys are usually carried out on a proportion of the total sample population.

When asked to criticise a question on a questionnaire, ask these questions:
• Is there a time frame?
• Do the response boxes overlap?
• Do the response boxes cover all possible responses?

Maths

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Maths

Designing investigations

There are **constraints** which must be considered when **designing an investigation** to test a hypothesis.

Considerations

- **Time** and **cost** to set up and carry out investigation.
- **Ethical issues** You must respect people's dignity and rights.
- **Confidentiality** It is important to keep data secure and confidential.
- **Convenience** of getting data locally.
- **Identifying the population** and method to collect sample data.
- Planning to gain more responses than you think you need, in case of **non-response**.
- Doing a **pilot survey** to help work out likely responses to sensitive questions.
- Planning what to do with **anomalous results**. (Read page 5 for a reminder about anomalous results.)

Planning for non-response

- Decide on the number of responses you need to do a valid analysis of data.
- Do a pilot survey to work out the proportion of surveys which are likely to be returned.
- Use this proportion to work out how many surveys to send.

Calculating the number of surveys

For a survey, 300 responses are needed.

In the pilot survey, 50 questionnaires are sent out. 40 responses are received.

The proportion of responses received is $\frac{40}{50} = \frac{4}{5}$

Statistics

Completing a two-way table

This two-way table shows the numbers of male and female musicians in each section of an orchestra.

To complete a two-way table look for rows or columns with only one missing value.

Top row total is 23 + 17 = 40

	Strings	Wind and brass	Total
Male	23	17	40
Female	34	8	42
Total	57	25	82

42 − 34 = 8 so '8' must go in female wind and brass.

Bar charts and vertical line graphs are a good way of representing discrete data given in a tally chart or frequency table.

They can also be used to represent qualitative data. You met these types of data on page 1.

The table shows information about the types of trees in a wood.

Type of tree	Frequency
Oak	6
Ash	8
Pine	4
Beech	2

The bar chart shows how this information can be displayed.

Types of trees in a wood
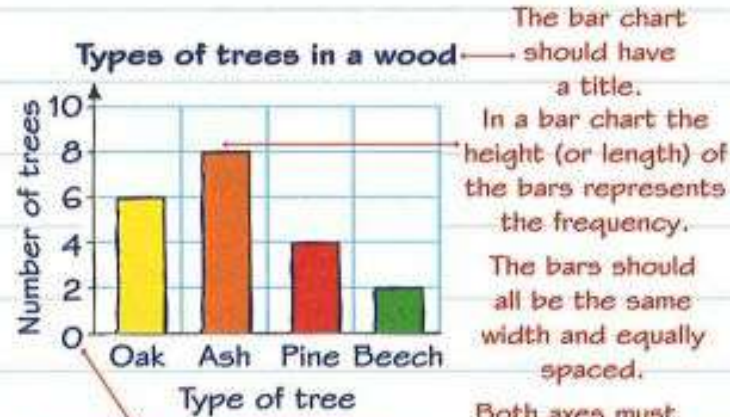
The bar chart should have a title.

In a bar chart the height (or length) of the bars represents the frequency.

The bars should all be the same width and equally spaced.

Both axes must be labelled. You can label the vertical axis 'Frequency'.

The vertical axis should start from 0 and go up by equal amounts each division.

Statistics

Multiple bar charts

This multiple bar chart shows the sales of three makes of cars in four quarters of one year.

There are four sets of three bars to show how sales change over the year.

Using this bar chart it is easy to see that sales of Seat cars were high in the first two quarters but then fell.

The bars must be in the same order for each quarter.

Car sales

Key: Honda, Ford, Seat
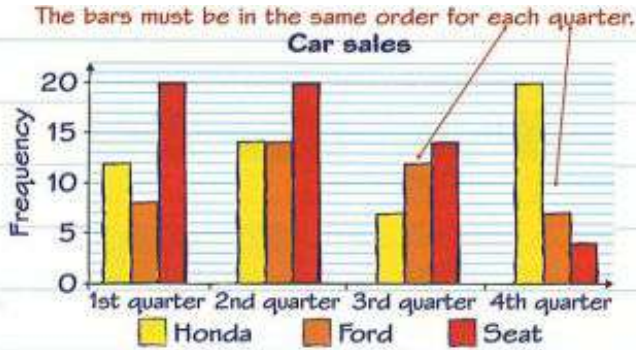
Composite bar charts

This composite bar chart shows how the percentages of men and women seen jogging have changed over two years.

The percentage of women has increased from 25% to 40%.

Composite bar charts can be harder to understand than multiple bar charts but do show the proportions within each group better.

Key: Men, Women
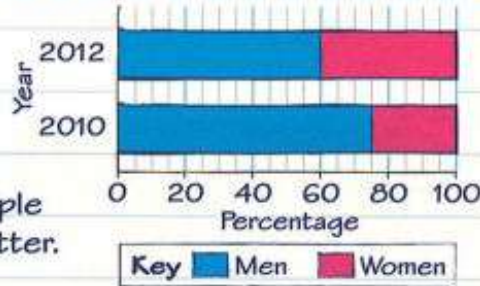
Interpreting pie charts

This pie chart gives information about the replies that students gave to the question 'What is your most important subject?'

The pie chart shows that 'English' got the most votes and 'Maths' got one quarter of the votes.

Most important subject

Other 75°, English 150°, Science 45°, Maths

The fraction of students who said 'English' is $\dfrac{150}{360}$

The fraction of students who said 'Science' is $\dfrac{45}{360}$
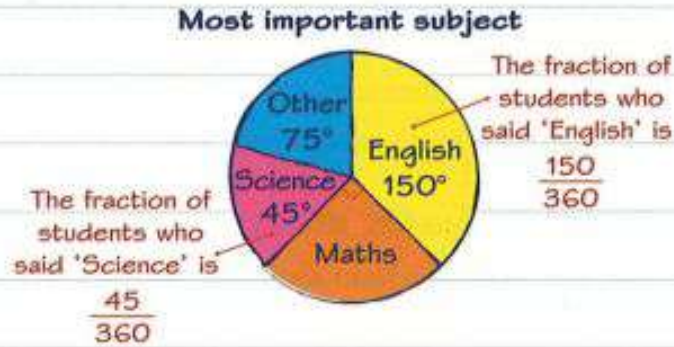
Using a formula

You can use this formula to work out what each sector represents:

$$\text{Number represented} = \frac{\text{angle of sector}}{360} \times \text{total}$$

LEARN IT!

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Stem and leaf diagrams

The ordered display of individual discrete data values in a stem and leaf diagram shows the distribution of the data.

The diagram shows the numbers of emails 15 people received one day.

The **key** is necessary to interpret the diagram.

The **leaves** must always be single digits.

The column with 0, 1, 2 and 3 is the stem.

The rows contain the leaves.

In this case the tens make the stem and the units are the leaves.

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

Key 3 | 5 represents 35 emails

Back-to-back stem and leaf diagrams

Back-to-back stem and leaf diagrams show two sets of data with the same stem. The smallest values on each row are next to the stem.

This diagram shows the marks of a group of students in two tests.

In a back-to-back stem and leaf diagram, the keys can be combined.

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

Key: 6|5 = 56   5|7 = 57

6|5|7 represents 56 marks on the left and 57 marks on the right.

Median

The median is the middle value when the data is written in order of size.

In a frequency table the data is already in order.

Make an extra column headed Cumulative frequency.

Fill in the column by starting with 5.

The median is found by using the rule

Median $= \dfrac{n+1}{2}$ th data value

where n is the total frequency.

Number of cars	Frequency	Cumulative frequency
0	5	5
1	16	21
2	12	33
3	10	43
4	7	50
5	3	53

Add a cumulative frequency column.

Write down the first frequency.

$5 + 16 = 21$ goes here.

The final number in this column should equal the total frequency.

The median is the $\dfrac{53+1}{2}$ th value.

The 27th value is 2, so median is 2.

Mode

The mode is the value with the **highest frequency** (the value that appears most often). Be careful – the mode is the **data value** and **not** the frequency.

Mean of discrete data from a frequency table

Use the formula: Mean $= \dfrac{\sum fx}{\sum f}$

Add another column to the right of the table for $f \times x$.

The table here gives information about European shoe sizes of 20 people.
The mean $= 598 \div 20 = 29.9$

28, 30, 32 and 34 are the x-values.

Shoe size	Frequency	f × x
28	8	8 × 28 = 224
30	7	7 × 30 = 210
32	3	3 × 32 = 96
34	2	2 × 34 = 68
	20	598

These two columns are the original table.

This is $\sum f$ (the sum of the frequencies).

This is $\sum fx$.

Maths

Modal class and class containing the median

The **modal class** is the interval which has the highest frequency.

The table gives information about the lengths of time some trains were late.

The **class that contains the median** is found by using cumulative frequency.

The median is the $\frac{n+1}{2}$ th data value in the table where n is the total of the frequencies.

The modal class is $0 < T \leq 5$ because it has the highest frequency.

Time late, T (minutes)	Frequency	Cumulative frequency
$0 < T \leq 5$	12	12
$5 < T \leq 10$	8	20
$10 < T \leq 15$	11	31
$15 < T \leq 20$	8	39
$20 < T \leq 25$	4	43

$\frac{n+1}{2} = \frac{43+1}{2} = 22$

The 22nd data value lies in the interval $10 < T \leq 15$

The lowest 20 times go up to here. The 21st and 22nd times are in the next interval.

Mean of continuous data from a frequency table

The table gives information about the times some students spent on homework.

The midpoint of each interval is found by adding the end points and dividing by 2.

The midpoint of the interval $20 < T \leq 30$ is $x = \frac{20+30}{2}$

$= 25$

Because you are using the midpoint of each interval, you are working out an **estimate** for the mean. You would need to know the time taken by every student to find the exact value.

Time, T (mins)	Frequency	Midpoint (x)	f × x
$0 < T \leq 10$	12	5	12 × 5 = 60
$10 < T \leq 20$	8	15	8 × 15 = 120
$20 < T \leq 30$	3	25	3 × 25 = 75
$30 < T \leq 40$	2	35	2 × 35 = 70
	25		325

This is $\sum f$ (the sum of the frequencies).

This is $\sum fx$.

Using the formula, $\bar{x} = \frac{\sum fx}{\sum f} = 325 \div 25 = 13$

Maths

Transforming data

Calculating with transformed values

You can sometimes calculate the mean more easily if the data is transformed first.

This is a list of door heights:

2.05   2.02   2.14   2.01   2.20   2.09

To find the mean, these numbers can be transformed.

First subtract 2 from each value:

0.05   0.02   0.14   0.01   0.20   0.09

Then multiply by 100:

5   2   14   1   20   9

Mean of transformed numbers

$$= \frac{5 + 2 + 14 + 1 + 20 + 9}{6} = \frac{51}{6} = 8.5$$

Now reverse what you did to the numbers:

• divide by 100

• add 2.

Mean of original numbers $= \dfrac{8.5}{100} + 2 = 2.085$

Worked example   **F&H**

(a) Find the mean, median and mode for this list of prices.   (3)

£45   £28   £36   £57   £28

Mean = (45 + 28 + 36 + 57 + 28) ÷ 5
    = £38.80

In order: 28   28   (36)   45   57

Median = £36

Mode = £28

(b) The prices are increased by 20%. Find the new mean, median and mode for this data.   (2)

New mean = £38.80 × 1.2 = £46.56

New median = £36 × 1.2 = £43.20

New mode = £28 × 1.2 = £33.60

To increase a value by 20% use the multiplier 1.2 to find 120%.

Maths

Population pyramids

Population pyramids are similar to bar charts or stem and leaf diagrams.

They give information about the age structure of a population.

The bar charts are presented horizontally with male and female populations on opposite sides.

The diagram shows an estimation of the population (in thousands) in Edinburgh in mid-2016.

In the 21–40 age group there were just under 90000 males and just over 90000 females.

The vertical scale always has the youngest ages at the bottom.

The scales on both sides must be the same.
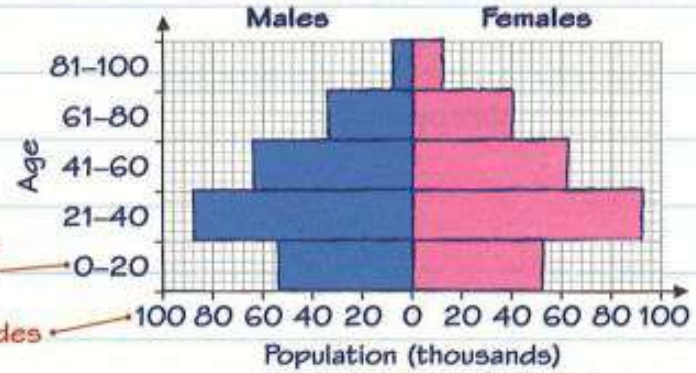
Source: Office for National Statistics.

Choropleth maps

A **choropleth map** uses different colours or shading to show how data varies across different **geographic** areas. This choropleth map shows the distribution in the UK of the surname 'Davies'.

You need to be able to interpret and compare choropleth maps.

Key
Low
High

There must be a key to interpret the shading.

The distribution of the surname Davies in the UK

Normally, higher concentrations are darker on the diagram.

52

Comparative pie charts

Comparative pie charts are used to **compare** the numbers in populations of **different sizes**.

These two pie charts show preferred sources for news for men and women.

The pie chart for women is larger than the pie chart for men because the total number of women sampled is greater.

Men

Paper 120°
TV 90°
Radio 150°

Women

Paper 120°
TV 80°
Radio 160°
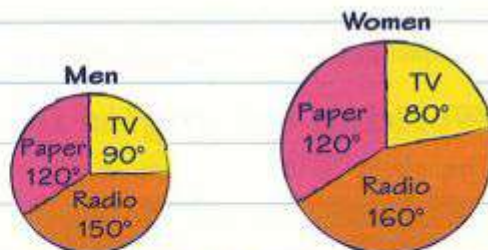
$$\frac{\text{area of large pie chart}}{\text{area of small pie chart}} = \frac{\text{total number of women}}{\text{total number of men}}$$

Making a comparison

$$\frac{\text{area of large pie chart}}{\text{area of small pie chart}} = \frac{\pi R^2}{\pi r^2} = \frac{R^2}{r^2} = \frac{N}{n}$$

LEARN IT!

So, use $= \frac{R^2}{r^2} = \frac{N}{n}$ where r is the radius of the small circle, R is the radius of the large circle, n is the total number in the small sample and N is the total number in the large sample.
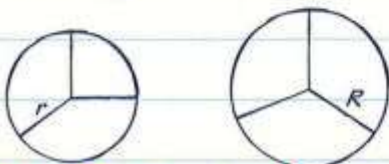
Total number = n Total number = N

Weighted mean

A weighted mean is one where each data value is multiplied by a number (the weight) based on importance.

The weighted mean $\bar{x}$ is given by the formula

$$\bar{x} = \frac{\sum wx}{\sum w}$$

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where w is the weight given to each variable, x.

For example, in an interview for a job, people have to do four tasks: A, B, C and D.

The weights given to the tasks are 1, 2, 2 and 5, meaning that task D is the most important and task A the least.

Task	A	B	C	D
Weight	1	2	2	5
Jim's mark	10	8	7	4
Anne's mark	3	4	6	8

Jim's weighted mean

$$= \frac{1 \times 10 + 2 \times 8 + 2 \times 7 + 5 \times 4}{1 + 2 + 2 + 5} = 6$$

Anne's weighted mean

$$= \frac{1 \times 3 + 2 \times 4 + 2 \times 6 + 5 \times 8}{1 + 2 + 2 + 5} = 6.3$$

Histograms and frequency polygons

You use a **histogram** to represent **grouped continuous data**. There are **no gaps** between the bars on a histogram (unless one of the intervals has a zero frequency).

A **frequency polygon** is formed by joining the midpoints of the tops of the bars in a histogram. It is a useful way to show the shape of a distribution.

Interpreting histograms

You can read frequencies from the histogram as well as work out cumulative frequencies.

This histogram shows the distances people could throw a rock.

It shows that there were 5 people who threw between 4 m and 5 m.

You can work out that there were 5 + 8 = 13 people who threw up to 6 m.

Frequency is always on the vertical axis.

5 people threw between 4 m and 5 m.

In histograms with equal intervals, the bars **must** be equal width.

Maths
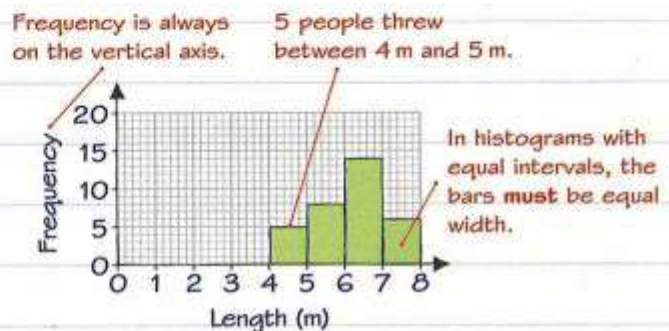
Histograms

A histogram is similar to a bar chart, but where a bar chart is used for categorical or discrete data, we use a histogram for continuous data e.g. heights, weights, time etc.

Key features:

- There are no gaps between bars and bars may be different widths
- The horizontal scale is linear and not grouped
- The vertical axis is labelled **frequency density**
- The **frequency** is represented by the **area of each bar** rather than the height of each bar

e.g. Draw a histogram of the following data

Length of time	Frequency
$0 \leq t < 10$	60
$0 \leq t < 15$	40
$15 \leq t < 20$	75
$20 \leq t < 50$	150

First we need to calculate the frequency density

$$\text{Frequency density} = \frac{\text{Frequency}}{\text{Class Width}}$$

Length of time	Frequency	Frequency density
$0 \leq t < 10$	60	$60 \div 10 = 6$
$10 \leq t < 15$	40	$40 \div 5 = 8$
$15 \leq t < 20$	75	$75 \div 5 = 15$
$20 \leq t < 50$	150	$150 \div 30 = 5$

Class width is the difference between the 2 bounds so this one is 50 – 20 = 30

The area of this bar is 150 which is the frequency of the group $20 \leq t < 50$

Frequency density vs Length of time (t hours)

Maths HIGHER ONLY
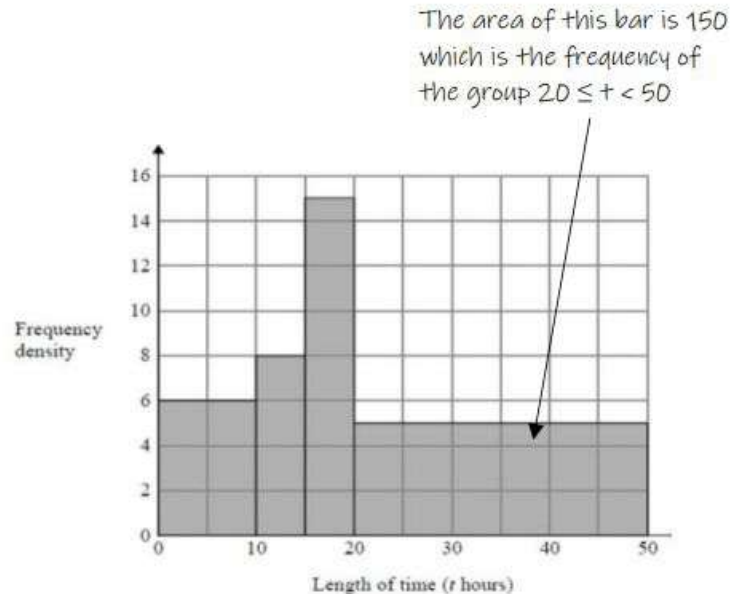
Statistics

Pictograms

Pictograms are a way of summarising data in a chart. You need to be able to draw and interpret pictograms.

This pictogram shows information about sales from a shop.

You will be expected to deal with halves and quarters when interpreting pictograms.

Pictograms may not be suitable for large numbers as symbols often cannot be easily divided.

Week 1	🍾 🍾 🍾
Week 2	🍾 🍾
Week 3	🍾 🍾 🍾 🍾
Week 4	🍾

Key 🍾 represents 12 bottles

3 × 12 = 36 bottles sold in Week 1.

This half symbol means 12 ÷ 2 = 6 bottles. So 42 bottles were sold in Week 3.

The **key** shows how many each symbol stands for.
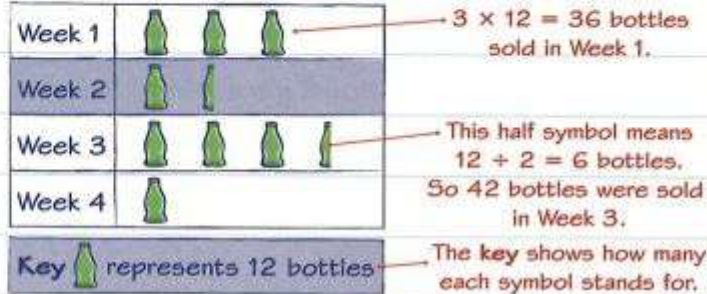
Tables

When extracting information from tables make sure you read the table and the units carefully. Figures in tables can sometimes be **rounded**.

This table shows the numbers of people who voted in three General Elections.

| Year | Voters (millions) | | | | | |
	CON	LAB	LD	PC/SNP	Other	Total
2010	10.70	8.61	6.84	0.66	2.88	29.69
2015	11.30	9.35	2.42	1.64	6.00	30.70
2017	13.64	12.88	2.37	1.14	2.18	32.20

Source: House of Commons Library

The figures are given in millions.

These numbers have been rounded to two decimal places (the nearest 10000 voters). Rounding can sometimes result in anomalies.

The trend for the total number of voters between 2010 and 2017 is **upwards** (or **increasing**).

You may be asked to comment on a **trend**, which is normally **upwards** or **downwards** but can also be **flat**.

Probability

For **equally likely outcomes** the probability (P) that something will happen is:

$$\text{Probability} = \frac{\text{Number of successful outcomes}}{\text{Total number of possible outcomes}}$$

If you know the probability that an event **will** happen, you can calculate the probability that it won't happen:

P(Event doesn't happen) = 1 − P(Event happens)

The probability of rolling a 6 on a normal fair dice is $\frac{1}{6}$. So the probability of **not** rolling a 6 is $1 - \frac{1}{6} = \frac{5}{6}$

Add or multiply?

Events are **mutually exclusive** if they can't **both** happen at the same time. For mutually exclusive events:

P(A or B) = P(A) + P(B)

Events are **independent** if the outcome of one doesn't affect the outcome of the other. For independent events:

P(A and B) = P(A) × P(B)

Sample space diagrams

A **sample space diagram** shows you all the possible outcomes of an event. Here are all the possible outcomes when two coins are flipped.

Second coin \ First coin	H	T
H	HH	TH
T	HT	TT

There are four possible outcomes. TH means getting a tail on the first coin and a head on the second coin.

The probability of getting two tails when two coins are flipped is $\frac{1}{4}$ or 0.25 There are 4 possible outcomes and only 1 successful outcome (TT).

Relative frequency

You need to be able to calculate probabilities for data given in graphs and tables. You can use this formula to estimate a probability from a frequency table:

$$\text{Probability} = \frac{\text{Frequency of outcome}}{\text{Total frequency}}$$

When a probability is calculated like this it is sometimes called a **relative frequency**.

Golden rule

Probability estimates based on relative frequency are **more accurate** for larger samples (or for a larger number of trials in an experiment).

Experimental probability

You can carry out an experiment to estimate the probability of something happening. This table shows the results of throwing a drawing pin 60 times.

Number of trials	10	20	30	40	50	60
Frequency of landing point up	8	11	17	25	30	37

To estimate the probability that the drawing pin will land point up, you calculate the relative frequency. The most accurate estimate will be based on the largest number of trials.

Venn diagrams

You can use a Venn diagram to show frequencies in a probability question. This Venn diagram shows the results when 50 people were asked whether they owned a dog (D) or a cat (C). The rectangle represents everyone who was surveyed. The **number** in each section tells you **how many** people that section represents.

In total $21 + 8 + 6 + 15 = 50$ people were surveyed.
This symbol represents all of them.

This oval represents people who owned a cat.
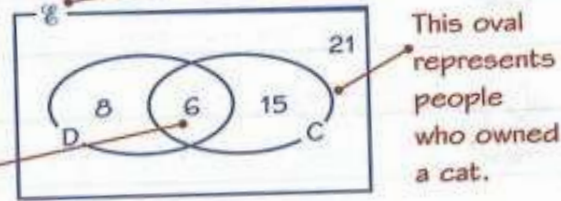
Some people owned a cat and a dog so the ovals overlap.
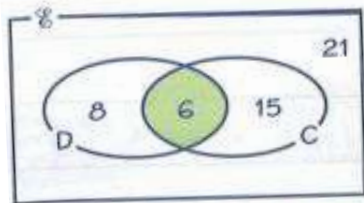
6 people owned a dog **and** a cat. You can write this as $D \cap C$. ∩ means **and or intersection**.
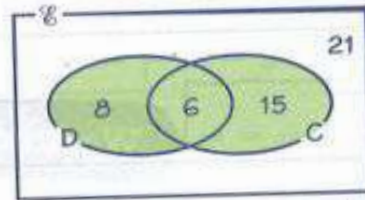
$8 + 6 + 15 = 29$ people owned a dog **or** a cat. You can write this as $D \cup C$.
∪ means **or or union**.
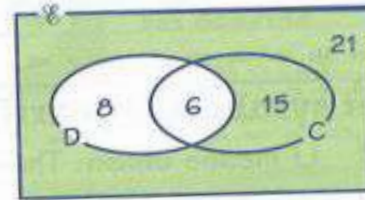
$15 + 21 = 36$ people **did not** own a dog. You can write this as D'. D' means **not D** or the **complement** of D.

Set notation

In mathematics a **set** is a collection of **members** (or **elements**). The elements in a set could be numbers, words or letters. You can define a set in two different ways:

1 Listing the elements
A = {onions, carrots, peas}
B = {13, 14, 15, 16}

You use curly brackets to define a set.
Members are separated by commas.

2 Using a rule
C = {months with exactly 30 days}
D = {odd numbers between 10 and 20}

'June' is a member of this set.
You could also write set D as {11, 13, 15, 17, 19}.

Set symbols to learn

✓ ∪ means **union**. The union of two sets is the set of elements that belong to **either** set.

✓ ∩ means **intersection**. The intersection of two sets is the set of elements that belong to **both** sets.

✓ ℰ means the **universal** set. It represents all the elements you are allowed to consider in a question.

✓ A' means **not A** or the **complement** of A. It is everything in ℰ but not in A.

58

Conditional probability

Tricky Topic

If one event **has already occurred**, the probability of other events occurring might **change**. This is called conditional probability. The probability that an event X occurs **given that** an event Y has **already** occurred is written as $P(X|Y)$.

Using Venn diagrams

You can solve some conditional probability problems using a Venn diagram. If an event has already occurred, then the sample space for the other events is **restricted**. These Venn diagrams show the outcomes of two events, A and B.

Complete sample space

$$P(A) = \frac{8+3}{8+3+4+5}$$

$$= \frac{11}{20}$$

Event B occurs

Restricted sample space **given that** event B has occurred

$$P(A|B) = \frac{3}{3+4} = \frac{3}{7}$$
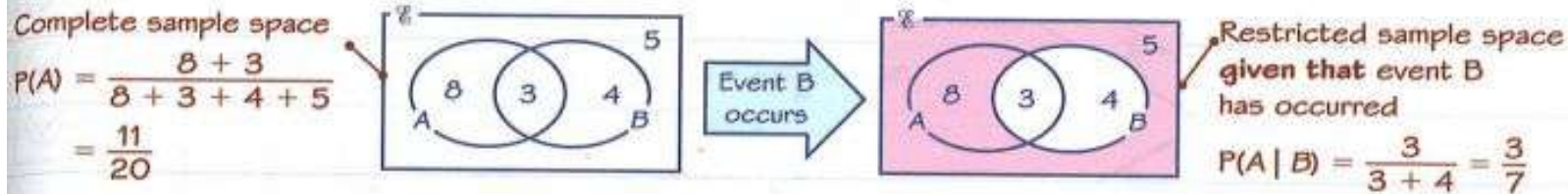
Two-way tables

You might have to work out probabilities from a two-way table. This table shows how a group of students travel to school.

	Car	Bus	Walk	Bike
Male	4	17	20	9
Female	8	20	29	11

Given that a student bikes to school, the probability that they are male is $\frac{9}{9+11} = \frac{9}{20}$

Tree diagrams

You can use a tree diagram to answer questions involving **conditional probability**.

A tree diagram shows all the possible outcomes from a series of events and their probabilities.

This is a tree diagram for Holly's journey to school.

You write the outcomes at the ends of the branches. You can use shorthand like this.

You write the probability for each event on the branch.

At each branch the probabilities add up to 1.
$\frac{2}{3} + \frac{1}{3} = 1$

The outcome of the first event can affect the probability of the second. Holly is less likely to be on time if she misses the bus.

Each branch is like a different parallel universe. In this universe, Holly misses the bus and gets to school on time.

	Outcome	Probability
Catch bus $\frac{2}{3}$ — $\frac{1}{4}$ Late	CL	$\frac{2}{3} \times \frac{1}{4} = \frac{2}{12} = \frac{1}{6}$
Catch bus $\frac{3}{4}$ On time	CO	$\frac{2}{3} \times \frac{3}{4} = \frac{6}{12} = \frac{1}{2}$
Miss bus $\frac{1}{3}$ — $\frac{4}{5}$ Late	ML	$\frac{1}{3} \times \frac{4}{5} = \frac{4}{15}$
Miss bus $\frac{1}{5}$ On time	MO	$\frac{1}{3} \times \frac{1}{5} = \frac{1}{15}$

You multiply along the branches to find the probability of each outcome.
The probability that Holly misses the bus and is late for school is $\frac{4}{15}$

Golden rules

1 Look out for the words **replace** or **put back** in a probability question.

With replacement: probabilities stay the same.

Without replacement: first probability stays the same while the others change.

2 MULTIPLY ALONG THE BRANCHES   ADD UP THE OUTCOMES

Counting strategies

You might need to find strategies for counting the total number of possible **combinations**. One way of finding combinations is to make a systematic list. Here are all the possible three-digit numbers that can be made from the number cards shown on the right.

| 4 | 5 | 6 |

456 465   **546 564**   **645 654** •————————•There are six possibilities.

Start by writing out   Then write the   Finally, write
the numbers that   numbers beginning   the numbers that
begin with 4.   with 5.   begin with 6.

Quadratic equations

Quadratic equations can be written in the form $ax^2 + bx + c = 0$ where a, b and c are numbers.

You need to be able to **solve** a quadratic equation without using your calculator.

1. **Rearrange** it into the form $ax^2 + bx + c = 0$

2. **Factorise** the left-hand side.

3. Set each factor **equal to zero** and solve to find two values of x.

For a reminder about factorising quadratic expressions, have a look at page 18.

Two to watch

1 When $c = 0$:
$x^2 - 10x = 0$
$x(x - 10) = 0$
Solutions are $x = 0$ and $x = 10$

2 When $b = 0$ (difference of two squares):
$9x^2 - 4 \qquad = 0$
$(3x + 2)(3x - 2) = 0$
Solutions are $x = \frac{2}{3}$ and $x = -\frac{2}{3}$

The quadratic formula

The solutions of the quadratic equation

$ax^2 + bx + c = 0$

where $a \neq 0$ are given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

You can use this formula for **any** quadratic equation. But be careful, not all quadratic equations have a solution.

LEARN IT!

Checklist

Equation is in the form $ax^2 + bx + c = 0$ ✓

Write down your values of a, b and c before you substitute. ✓

Use brackets when you are substituting negative numbers. ✓

Show what you have substituted in the formula. ✓

Simplify what is under the square root and write this down. ✓

The $\pm$ symbol means you need to do two calculations. ✓

Quadratic inequalities

On page 37 you revised **linear inequalities**. In your exam, you might need to solve a **quadratic inequality**, which involves an x^2 term.

Using a sketch

This graph shows a **sketch** of the **curve** $y = x^2$, and the **straight line** $y = 36$

For these values of x, the curve is **below** the line, so $x^2 < 36$

The solutions of $x^2 < 36$ are $-6 < x < 6$

For these values of x, the curve is **above** the line, so $x^2 > 36$

The solutions of $x^2 > 36$ are $x < -6$ or $x > 6$

62
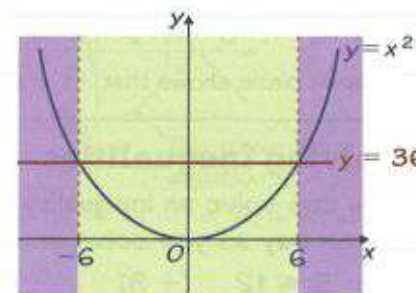
Percentage change

There are two methods that can be used to increase or decrease an amount by a percentage.

Method 1

Work out 26% of £280:

£280

$\frac{26}{100} \times £280 = £72.80$

Subtract the decrease:

£280 − £72.80 = £207.20

26% OFF

Method 2

Use a multiplier:

100% + 30% = 130%

$\frac{130}{100} = 1.3$

So the multiplier for a 30% increase is 1.3:

400 g × 1.3 = 520 g

400 g

PLUS 30% EXTRA

Reverse percentages

In some questions you are given an amount **after** a percentage change, and you have to find the **original amount**. To answer questions like this you need to be really confident with **percentage change**. Revise it on page 62.

Using a multiplier

You can use a multiplier to calculate a percentage increase or decrease. If you are given the **final amount** and you need to find the **original amount**, you can **divide by the multiplier**.

Here are two examples:

1 A sweater is **reduced** in price by 20% in a sale.

Original price × 0.8 → Sale price

£50 → £40

÷ 0.8

2 The average temperature **increases** by 5%.

Original temperature × 1.05 → Temperature after increase

22°C → 23.1°C

÷ 1.05
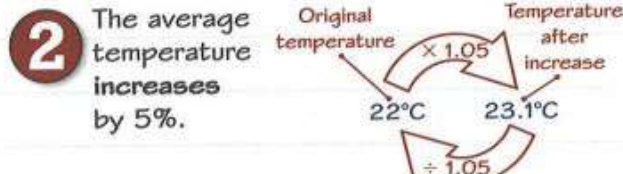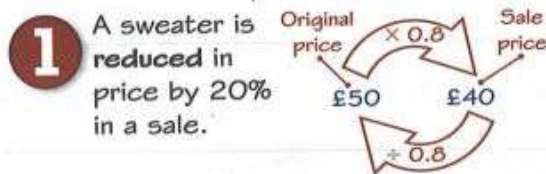
Growth and decay

You can use **repeated percentage change** to model problems involving growth and decay.

Compound interest

If you leave your money in a savings account it will earn compound interest.

Saanvi invests £40 000 at a compound interest rate of 3% per annum.

'Per annum' means 'per year'.

This table uses a multiplier to work out the balance of Saanvi's account at the end of each year.

End of year	Balance (£)
1	40 000 × 1.03 = 41 200
2	41 200 × 1.03 = 42 436
3	42 436 × 1.03 = 43 709.08

The multiplier for a 3% increase is × 1.03

You can use indices to work out the final balance after 3 years more easily.

Balance after 3 years
= £40 000 × 1.03 × 1.03 × 1.03
= £40 000 × 1.03^3
= £43 709.08

Golden rule

You can use this rule to calculate a repeated percentage change:

Final amount = (Starting amount) × (Multiplier)^n

n is the number of times the change is made.

LEARN IT!

Worked example

Target grade 5

At the start of an experiment a Petri dish contains 5000 cells. The number of cells in the Petri dish increases by 20% each day. Calculate the number of cells in the Petri dish at the end of 4 days. **(2 marks)**

5000 × 1.2^4 = 10 368

You can enter this in one go on your calculator by using the ▢ button.

63

Estimation

You can estimate the answer to a calculation by rounding each number to **1 significant figure**, and then doing the calculation. You can use this method to check your answers, or to estimate calculations on your **non-calculator paper**. Here are two examples:

1 $4.32 \times 18.09 \approx 4 \times 20 = 80$
The answer is approximately equal to 80.

2 $327^2 \approx 300^2 = 3^2 \times 100^2 = 90000$
The answer is approximately equal to 90000.

$\approx$ means 'is approximately equal to'

Decimal division trick

You might have to divide by a decimal on your non-calculator paper. If you multiply both numbers in a division by the same amount the answer stays the same.

$\dfrac{1400}{0.05} = \dfrac{140\,000}{5} = \dfrac{280\,000}{10} = 28\,000$

Recurring decimals

You can use algebra to convert a recurring decimal into a fraction. Here is the strategy:

Write the recurring decimal as n. $\Rightarrow$ Multiply by 10, 100 or 1000. $\Rightarrow$ Subtract to remove the recurring part. $\Rightarrow$ Divide by 9, 99 or 999 to write as a fraction.
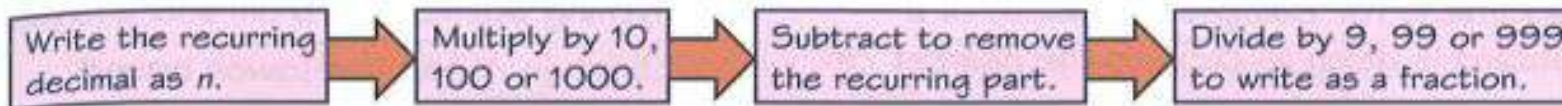
If you need to do this in your exam you must show **all your working**. For a reminder about recurring decimals have a look at page 6.

Multiply by...
- ✓ 10 if 1 digit recurs.
- ✓ 100 if 2 digits recur.
- ✓ 1000 if 3 digits recur.

PE

Participation rates

You need to know the reasons for the different levels of participation and the barriers preventing everyone playing sports

Data shows that some groups are more likely to participate in particular types of activity

WHY?

Data shows that some sports are more popular than others

Data shows that some groups do more exercise than other groups

Data shows that some groups do not do enough physical activities

Socio-Economic Groups

Explanation

Socio-economic groups split people according to their job and earnings. The groups are given an order

- **Highest order** – professional or managerial jobs where people have lots of responsibility. These jobs are often paid more money

- **Lowest order** – Jobs where there is no or limited responsibility These jobs are often paid less

Application

Cost
- Some sports such as golf costs a lot of money to play, this may affect a socio-economic group

Availability
- Some activities may be unavailable. To go skiing not only costs a lot of money but it is hard to get to.

Time
- Some activities can take a long time and requires a big commitment such as regularly playing golf

Gender

Explanation

Gender groups are determined by a person's sex (male of female)

The reasons why men and women participate more or less can be down to the activity.

Society still sees some activities associated to either men or women

Application

Image
- Some activities are seen as female such as dance, netball and aerobics. A male may be worried what other people would think if they participated

Cost
- Male generally earn more money than females this may prevent them from taking part in some sports

Time
- Females traditionally spend more time at home looking after children, as well as working

Age

Explanation

People are split into groups dependent on their age. The reasons why people from different age groups participate less than others can be due to the nature of the activity.

Application

Access
- Some sports clubs only have sessions for certain age groups at certain times. This may be a time when they are working

Cost
- Money may be needed for bills rather than sport

Time
- Less time due to work

Nature of the activity
Some activities may be harder to participate in when they get older. There are however sports specifically targeted for older groups

Disability

Explanation

People are split into groups dependent on their disability. There are many adapted activities available to people with disabilities such as wheel chair tennis and rugby.

Application

Availability
- Lack of clubs and facilities in the local area for disabled groups

Cost
- Specialist equipment may be expensive

Access
- Physical barriers such as lack of ramps or pool hoists

Stereotyping
- People may think someone with a disability are unable to participate

Ethnicity

Explanation

People are grouped based on their culture or specific origin. The reasons people from different ethnic groups participate more or less can be down to the nature but sometimes other barriers prevent them from taking part

Application

Cultural influences
- Family or peers influence whether someone does an activity or not

Cost
- Specialist equipment may be expensive

Stereotyping
- People from different backgrounds are steered towards or away from certain activities. E.g. people from African origin may be encouraged to participate in athletics rather than activities such as swimming

PE

CLASSIFICATION OF SKILL

A continuum is a line that goes between to extremes. Skills often fall somewhere between these 2 extremes.

open ——————— closed

basic ——————— complex
(simple)

low ——————— high
organisation ——————— organisation
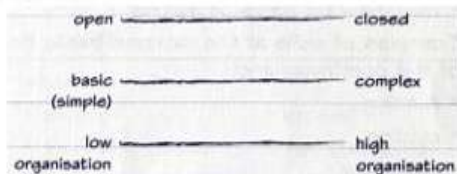
Open Skills:

Skills that are affected by the environment. Eg. A rugby tackle or a pass in football.

Closed Skills:

Skills that are **not** affected by the environment. Eg. Penalty kick.

Basic (simple) skills:

Skills that: are simple, require little thought, information or decision making. Eg running/swimming

Complex Skills:

Skills that: are difficult; need a lot thought and concentration; need a lot of information and decision making. Eg Lay-up in Basketball, dribbling around players

Low Organisation Skills:

Skills that: are easy to do; have clear separate phases and can be broken down into steps.

Eg Triple Jump or tennis serve

High Organisation Skills:

Skills that: are harder to do; don't have clear phases or are not easy to break down into phases.

Eg Somersault or golf swing

TYPES OF FEEDBACK

The type of feedback used is based on the type of skill and the ability of the performer. Feedback is vital to be able to improve the skill and reinforce good practice.

Intrinsic Feedback: Feedback from within the performer

Extrinsic Feedback: Feedback from outside the performer (coach)

Concurrent Feedback: Feedback given **during** a performance

Terminal Feedback: Feedback given **after** a performance

TYPES OF PRACTICE

Massed Practice: Little or no breaks in a session and the same skill is repeated over and over again. **For example:** 30 minutes practicing forehand drives on tennis. Used for: *experienced*/skilled/motivated/older athletes

Distributed Practice: Breaks are provided to allow rest periods or to change the activity. There are fewer repetitions and allows for more than one skill to be practiced. **Used for:** *beginners*/not very skilled/young athletes

Fixed Practice: When the whole movement of a skill is repeatedly practiced so it is learned, **for example, a golf swing.**

Variable Practice: The same skill is repeated in different situations, so performer knows how to deal with them in competition. **For example:** Practicing against opposition means there will always be different scenarios.

MENTAL REHEARSAL

Mental rehearsal is a technique used by many elite athletes, whereby they mentally practice the skill in their mind before physically completing it.

Mental rehearsal can be completed during:

- The warm up. Prepare both physically **and** mentally
- An event. Goes through skills in their mind
- A performance. When there is a break in play.

The advantages of mental rehearsal are:

Develop existing skill, focus mind on the task, reduce anxiety, build confidence.

TYPES OF GUIDANCE

Guidance is used to help performers improve. The type of guidance used depends on the skill and ability of the performer.

Verbal Guidance: Performer is **told** the information

Advantage: Quick, no equipment. Disadvantage: Some can be difficult to explain

Visual Guidance: Performer is **shown** the skill

Advantage: Can copy movement. Disadvantage: Demonstration could be poor

Manual Guidance: Coach physically supports performer. Eg Gymnastics coach holding legs during a handstand.

Mechanical Guidance: Coach uses equipment to support. Eg Harness in trampolining, float in swimming.

GOAL SETTING

We use goal setting when training to **increase** motivation and focus. It also **improves:** monitoring of progress, and planning.

To do this we use: **S.M.A.R.T. Targets**

SMART targets

In order for the goals you set to be successful, you need to use SMART targets. You need to apply all of them.

SMART stands for:

S = Specific
M = Measurable
A = Achievable
R = Realistic
T = Time bound

S = Specific: The goal you set must be clear.

M = Measurable: To know have successfully achieved your goal, it needs to be measured (i.e. against time).

A = Achievable: Must be possible for you to do.

R = Realistic: Possible given all factors involved (eg training facilities)

T =Time bound: your goal needs to have a time frame for completion.

Diet and Energy Balance

Balanced diet: Eating the right foods in the right amounts.

There are seven nutrients.
- Carbohydrates
- Fats
- Proteins
- Vitamins
- Minerals
- Fibre
- Water

Energy Balance

Making sure the calories we eat is equal to the number of calories we burn.
- If we eat more calories than we burn, we will **gain** weight
- If we eat less calories than we burn, we will **lose** weight
- If we eat the same number of calories as we burn, our weight will **stay the same** (it is balanced).

Energy In   Energy Out

Optimum Weight

The ideal weight someone should be.

This will depend on their:
- **Bone structure**
- **Sex**
- **Muscle girth**
- **Height**

BODY MASS INDEX
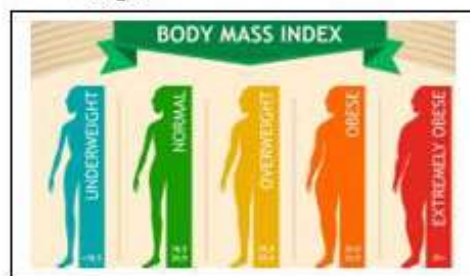
Dietary Manipulation

Protein intake:
- Protein should be consumed as soon as possible after exercise.
- this increases protein synthesis and therefore muscle growth.
- This is used by performers such as sprinters, shot putters and power lifters

Carbohydrate loading:
- This strategy involves eating foods high in carbohydrates 1 to 4 days before an event.
- These increases glycogen stores in the muscle.
- This is used by endurance athletes such as marathon runners

Hydration:
- Water prevents dehydration,
- Dehydration causes: dizziness, fatigue, heat stroke, muscle cramps, nausea and the thickening of blood.
- Water should be consumed before during and after exercise

Macronutrients

Nutrients that we need to eat in large quantities. We need them for energy, growth and repair.

Carbohydrates
Function:
- Eaten in large quantities Provide us with energy

Fats
Function:
- Provide us with energy, is stored in the body and can lead to weight gain

Proteins
Function:
- Used for growth and repair of muscles

Micronutrients

Nutrients we need in our diet in small amounts.

Vitamins & Minerals
- Vitamins and minerals keep our body healthy and can improve your immune system

Water
- Water prevents dehydration and is found in most liquids and many foods

Fibre
- Fibre aids the digestive system and is found in foods such as cereals, vegetables and nuts

PE

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Health

It is a state of complete emotional, social and physical wellbeing and not merely the absence of disease and infirmity.

Negative effects of physical activity on health

- Overexertion- when you push yourself too hard physically
- Injuries- Over strain muscles and you cannot take part in physical activity
- Obsession with physical activity and less time with family and friends

Physical Health	Social health	Emotional Health
• Reduced chance of obesity • Cardiovascular Hypertrophy (growth of the heart) • Strengthens bones • Reduce chance of coronary heart disease. • Reduced chance of a stroke	• Making new friends • Respecting opponents (e.g. shaking the refs hand at the end of a game) • Improved communication (e.g. calling man on in football) • Increased social activities and less likely to be involved with anti-social behaviour. • Opportunities to get together with existing friends.	• Increase serotonin (feel good hormone) • Aesthetic Appreciation (how good a skill looks) • Increased self-esteem (how you feel about yourself) • Provides competition

Sedentary Lifestyle

A lifestyle where there is very limited or no physical activity.

Health Risks

- Obesity - Describe people who are extremely overfat.
- Osteoporosis - Weakened bones
- Heart Disease - Weakened heart
- Type 2 Diabetes - Pancreas produces too much insulin
- Poor Posture - Weakened muscles
- Depression - Severe feeling of sadness due to low self-esteem and low
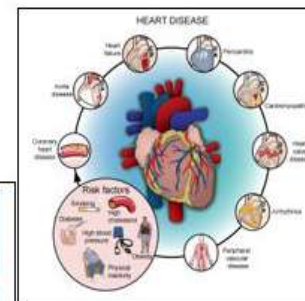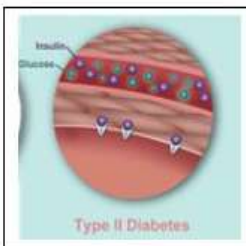
Lifestyle Choices - DRAW	
Diet	2500 calories for men 2000 calories for women Poor diet - Anorexia. Obesity osteoporosis
Recreational Drugs	Alcohol - lead to obesity due to number of calories in the substance and slower reaction time Smoking - Causes emphysema. The tar restricts the alveoli, which reduces oxygen intake and causes breathlessness
Activity Levels	5-18 year olds should exercise 1 hour every day Burns calories consumed in food in order to prevent obesity
Work, rest, sleep, balance	Lack of sleep can lead to tiredness, lack of concentration and irritability with teammates

GCSE Physical Education – The structure and functions of the cardiovascular system

Structure of the cardiovascular system

Aorta
Vena Cava
Pulmonary vein
Pulmonary artery
Left atrium
Right atrium
Bicuspid valve
Semi-lunar valves
Tricuspid valve
Left ventricle
Right ventricle
Septum
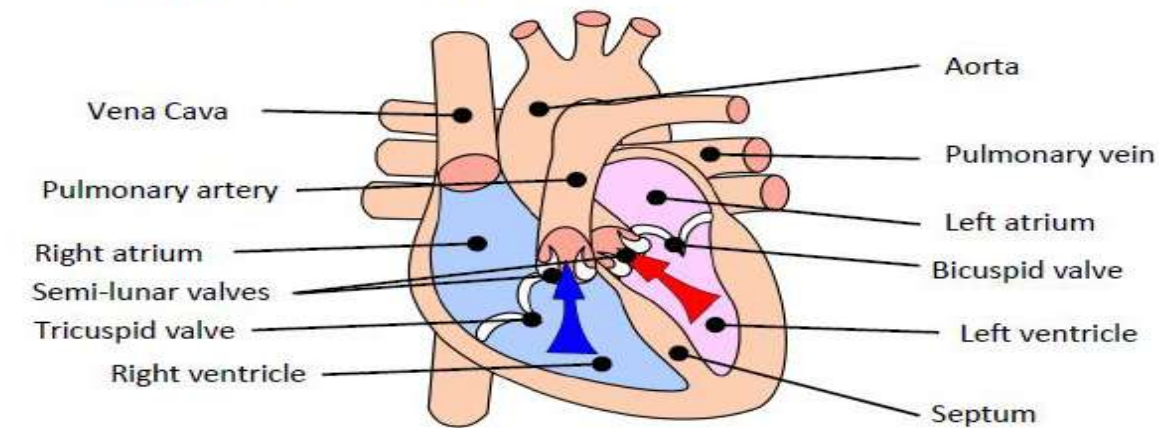
Deoxygenated blood = BLUE (Right side)
Oxygenated = RED (Left side)

Vascular Shunting

Increased demand for oxygen → Blood flow increased to working muscle groups → Vasoconstriction / Vasodilation → Re-distribution of blood flow (Vascular shunt)
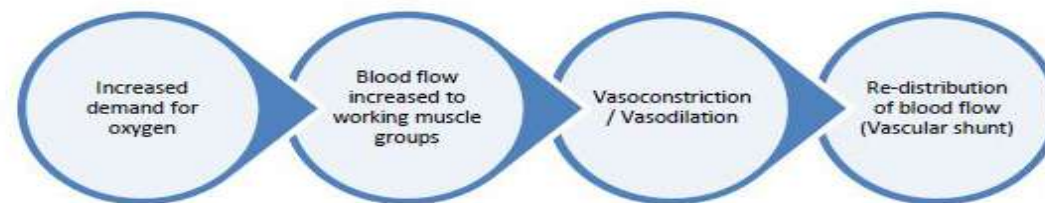
Vasoconstriction – NARROWING   Vasodilation - EXPANDING
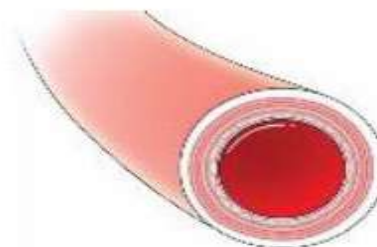
Function of the cardiovascular system

- Transport of oxygen, carbon dioxide and nutrients
- Clotting of open wounds
- Regulation of body temperature

Blood vessels

Arteries	Veins	Capillaries
1. Away from the heart 2. Oxygenated blood (except pulmonary artery) 3. Thick/elastic walls 4. High pressure 5. Small lumen	1. Back to the heart 2. Deoxygenated blood (except pulmonary vein) 3. Thin walls + larger lumen 4. Lower pressure 5. Valves	1. In the tissue 2. Site of gaseous exchange 3. Very thin walls

Components of blood - Red blood cells

Carry oxygen from the lungs to the working muscles + Removes CO_2.
Haemoglobin binds the oxygen

White blood cells

Are part of the immune system and **fight disease** and infection.
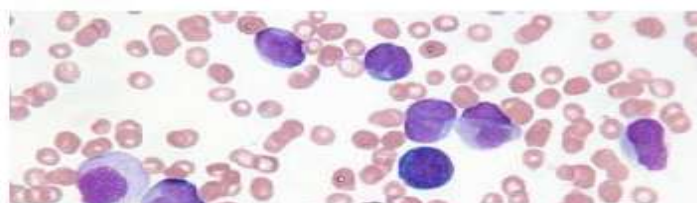
Platelets & Plasma

Platelets **clot blood** and form a scab around the site of injury.

Plasma is the **liquid/fluid** part of blood that allows it to flow.

Plasma (55%)
White blood cells and platelets (<1%)
Red blood cells (45%)
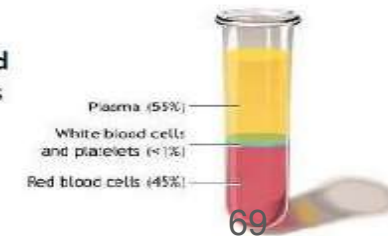
GCSE Physical Education – Performance-enhancing dugs, injury and prevention

Injury prevention – to prevent injury performers and coaches should recognise and identify risks and reduce them.

Using the right principles of training to over overuse injuries	Understand and following the rules of the sport during play	Using appropriate protective clothing	Checking the equipment to make sure it is in good condition and age appropriate	Following a full warm up and cool down	Checking the facilities	Ensuring competition is balanced

Performance Enhancing Drugs (PEDs)

The rewards that come with winning are so great that athletes are increasingly temped to cheat. Fame, money and pressure are commonly cited despite the health risks or even death.

Drug	Reason for athlete taking this	Health risk	Sporting example who might use it
Beta Blockers	Slows heart rate, calms and steadies hands	Lowers blood pressure and oxygen delivery to muscles	Target sports
Anabolic Steroids	Promote muscle growth and promotes a faster recovery time	High blood pressure, aggressive behaviour & develops male features	Power Events - 100m
Narcotic Analgesics	Masks pain and increase pain threshold	Vomiting, addiction and liver/kidney damage	Any athlete wanted to mask pain.
Diuretics	Rapid weight loss from removal of fluids. Masks other PEDs	Dehydration, nausea and headaches. Heart and kidney failure.	Jockey Boxing
Stimulants	Increased alertness and reduce tiredness	Heart rate irregularities & increased aggression.	Boxing 100m sprinter
Peptide Hormones	EPO – increase Red Blood Cell production Growth Hormone – increase muscle mass	Increased blood thickness/blood clot Abnormal growth	

Blood doping – a method of artificially increasing red blood cell count – increases endurance.

Injuries
Soft tissue injuries
Strain – Pulled or overstretched muscle.
Sprain - Twisted or wrenched ligament.
Treatment for strain and sprain = **RICE** (Rest, Ice, Compression, Elevation)

R – rest the injured part.	I - Apply ice to reduce the swelling for a maximum of 10 minutes.
C – Compress the injured area using a bandage.	E – Elevate the injured part to decrease the blood supply.

Golfers Elbow/Tennis Elbow – overuse injury caused by inflamed tendons that attach muscles to the elbow joint. Symptoms also include soreness and pain.

Abrasions – minor injuries to the surface of the skin. *i.e. a graze.* Symptoms are a hot/burning sensation, redness and occasionally some light bleeding. Treatment – clean and cover with a low adhesive dressing.

Torn Cartilage – This can occur when a joint is twisted excessively. This is commonly caused when players change direction quickly. Treatment – ice and surgery

Concussion – An injury to the brain caused by a knock to the head. Common in contact sports. If an athlete is concussed, they may:
• Become unconscious.
• Feel sick, dizzy or drowsy.
• Get confused, stare & suffer memory loss.

Dislocation - a sudden impact on a joint can cause the bones that meet to become disconnected.
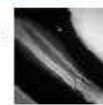
Fracture – a broken bone.
Open/compound/complex fracture – bone through the skin
Closed/simple fracture – bone remains in the skin.
Greenstick fracture – bone bends (younger children)
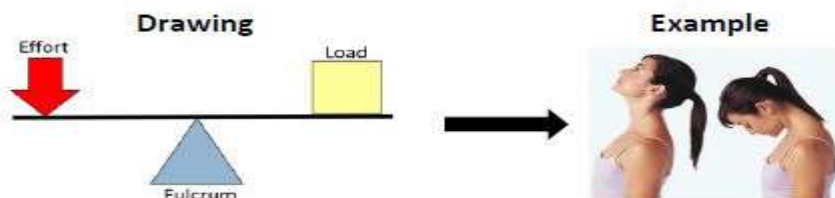Stress fracture - repeated or prolonged forces against the bone

GCSE Physical Education – Movement analysis

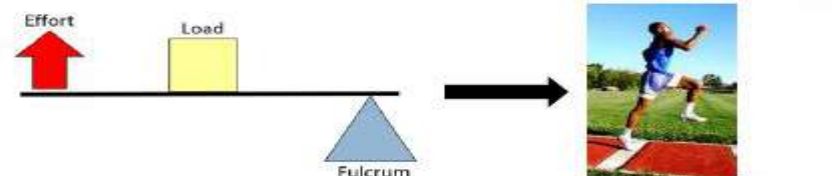**Levers** – a rigid bar that moves around a pivot point with force applied to it.

Fulcrum (F)	Effort (E)	Load (L)
A fixed pivot point	The source of energy that will be applied	The weight/resistance to be moved

Classes of lever

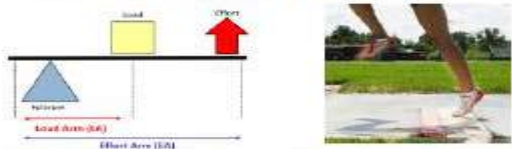**Drawing**

Example

First class lever:

Second class lever:

Third class lever:
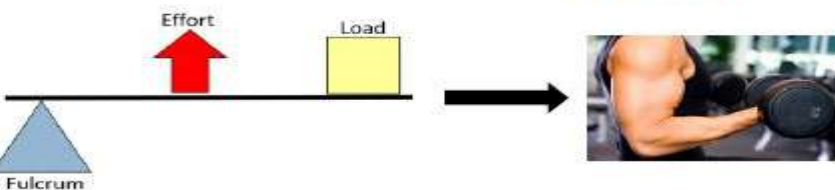
Mechanical advantage
This is were a lever's **effort arm** is greater than its **load arm**.
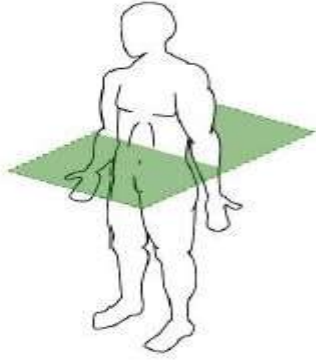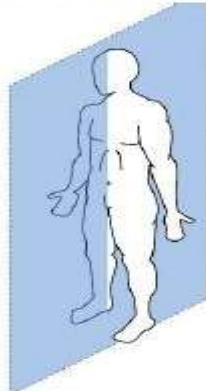
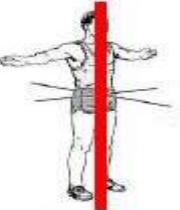Large loads can be moved with limited effort.

Mechanical disadvantage
This is were a lever's **load arm** is longer than its **effort arm**.
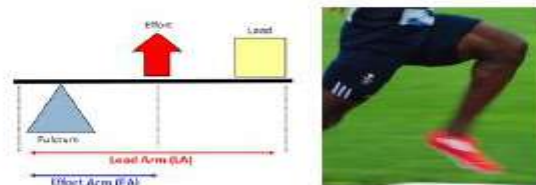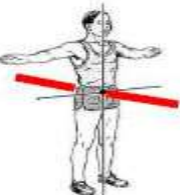


Planes – imagery lines that divide the body into two.

Frontal plane	Transverse plane	Sagittal plane
A vertical plane but this divides the body into **front** and **back**.	A horizontal plane that divides the body into **upper** and **lower** halves.	A vertical plane that divides the body into **right** and **left** sides.

Axes – imagery lines that the whole body turns around.

Sagittal axis	Vertical axis	Frontal axis
Runs through the body horizontally from the back to front.	Runs through the body vertically from the top to bottom.	Runs through the body horizontally from the left to right.
Example: Cartwheel	Example: Full twist	Example: Sommersault

PE

Structure of the respiratory system

Trachea
Bronchi
Bronchioles
Lung
Alveoli
Diaphragm
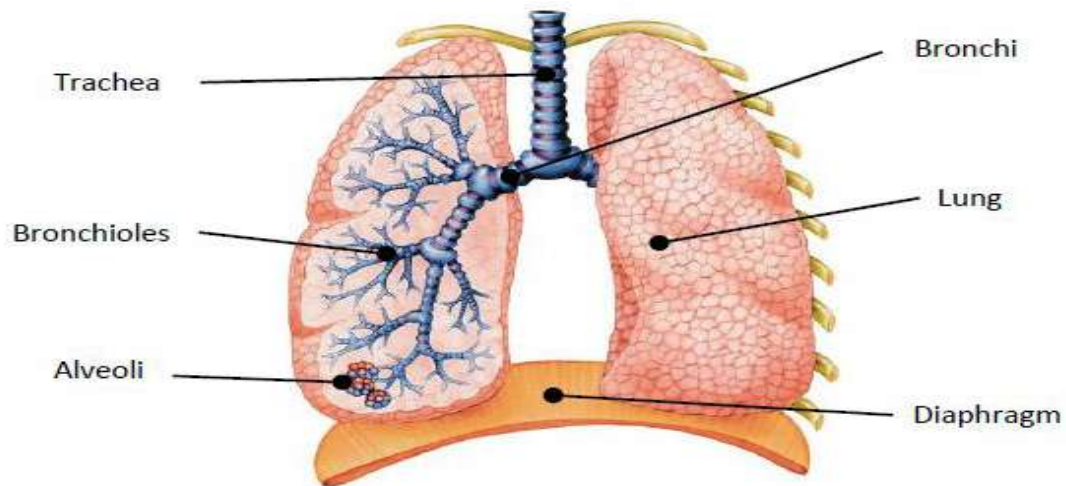
Composition of inhaled and exhaled air

Gas	Inhaled air	Exhaled air
Oxygen	21%	16%
Carbon dioxide	0.04%	4%
Nitrogen	78%	78%

Inhalation/Inspiration

Diaphragm and intercostal contract → Diaphragm flattens and pulls down → Lung size increases and air pressure inside is reduced → Air pressure outside the lungs moves from high to low and is drawn in

Exhalation/Expiration

Diaphragm and intercostal relax → Diaphragm returns to dome shape → Lung size reduces and air pressure inside is increased → Air pressure outside the lungs is lower and therefore air is exhaled
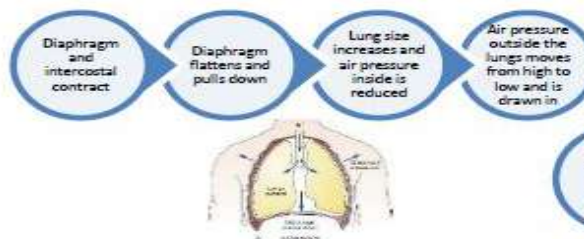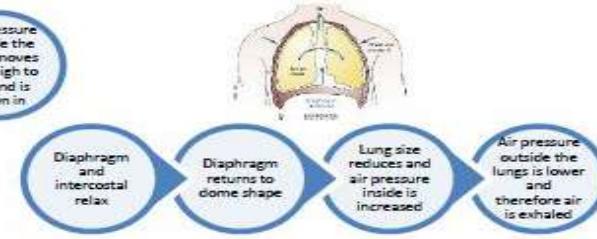
Respiratory values

Tidal Volume – the amount of air inhaled and exhaled per breath. Resting value = 500ml

Vital Capacity – The maximum amount of air exhaled following a maximal breath in.

Frequency – The number of breaths taken per minute. Resting value – 12-20 breaths.

Minute Ventilation – The amount of air inhaled and exhaled per minute. Measured in litres.

Frequency
Tidal Volume
Vital capacity
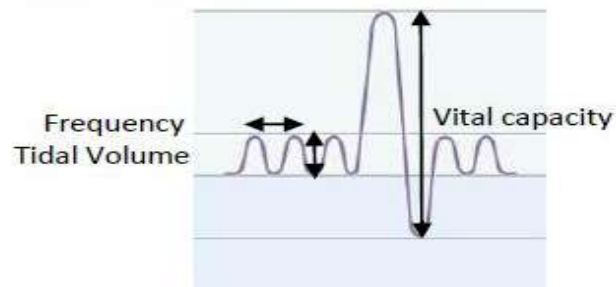
Gaseous exchange at the alveoli

- Diffusion is the movement of molecules from an area of high concentration to a low one.
- The alveoli have thin moist walls to allow diffusion to occur.
- Capillaries are closely wrapped around the alveoli to reduce the distance of diffusion and increase efficiency.

During inhalation:
- The concentration of **oxygen** is air is higher than the alveoli.
- The concentration of **carbon dioxide** in the blood is higher than that in the air.
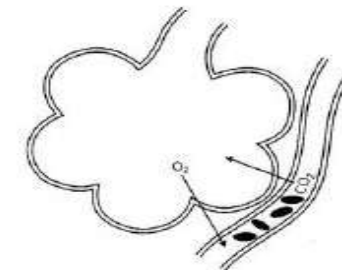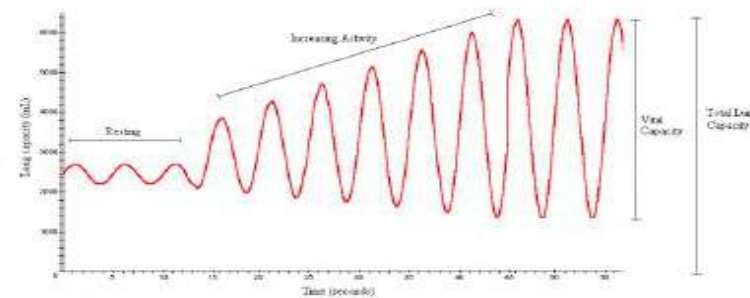

During exercise

Gaseous exchange increases as the intensity of the activity increases to cope with:
➢ An increase demand for oxygen at working muscles
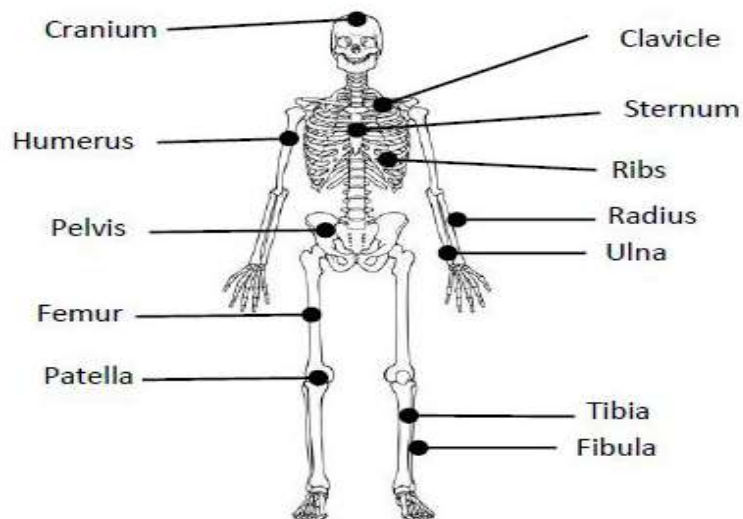➢ An increase in carbon dioxide production and the need to rid this waste product.

Frequency ↑ + Tidal Volume ↑

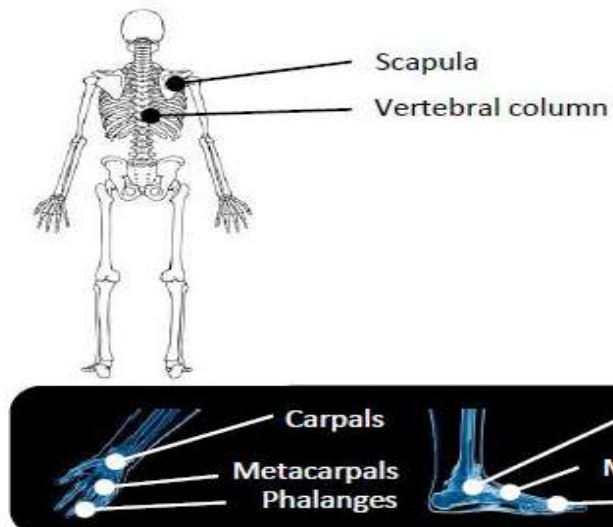Training increases total lung capacity and vital capacity readings.

PE

Structure of the skeletal system

- Cranium
- Clavicle
- Sternum
- Humerus
- Ribs
- Radius
- Pelvis
- Ulna
- Femur
- Patella
- Tibia
- Fibula

Structure of the skeletal system

- Scapula
- Vertebral column

- Carpals
- Tarsals
- Metacarpals
- Metatarsals
- Phalanges
- Phalanges

Vertebral Column

The vertebral column is divided into 5 sections. It is made up of irregularly shaped bones called vertebrae.

Each vertebra is protected with cartilage to prevent friction.

The vertebrae protects the spinal cord.

- 7 Cervical vertebrae
- 12 Thoracic vertebrae
- 5 Lumbar vertebrae
- Sacrum (5 fused)
- Coccyx (3 to 4 fused)

Function of the skeleton

- Protection of vital organs
- Muscle attachment
- Joints for movement
- Blood cell production (platelets, red and white)
- Storage of calcium and phosphorus

Classification of joint

- Pivot (neck – atlas and axis)
- Hinge (elbow and knee)
- Ball and socket (hip and shoulder)
- Condyloid (wrist)

Connective tissue

Ligaments – attaches bone to bone to add joint stability.

Tendons – attaches muscles to bone and contributes to joint movement as a result of muscle contraction.

Classification of bones

Long (leverage)	Short (weight bearing)	Flat (protection + muscle attachment)	Irregular (protection and muscle attachment)
Clear shaft region to the bone. *i.e. femur, humerus & phalanges*	Light, small and very strong. *i.e. carpals tarsals*	Broad surface area for muscle attachment. *i.e. cranium*	Assist the functioning of certain joints. *i.e. Patella/vertebrae*

Joint movements

Flexion	Adduction	Rotation	Dorsi-Flexion (ankle joint)
Decreasing the angle at a joint (bending)	Limbs moving towards the midline of the body.	A twisting/turning action around a joint.	When the toes are turned up to the body.
Extension	Abduction	Circumduction	Planter-Flexion (ankle joint)
Increasing the angle at a joint (straightening)	Limbs moving away from the midline of the body.	A combination of flexion, extension, adduction & abduction.	When the toes are pointed away from the body.

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PE

Muscular Strength
Test: Hand Grip Dynamometer Test
Protocol: Grip the dynamometer in one hand. Start with your hand up and bring down to side while pulling in handle. No swinging your hand.

Advantages	Disadvantages
• Simple and easy to complete	• Only one size of dynamometer which may affect reading. • Focuses solely on forearm strength.

Muscular Endurance
Test: 1 minute sit up test   **Test:** 1 minute press up test
Protocol: Complete as many full sit ups/press ups as possible in 1 minute.

Advantages	Disadvantages
• Simple test to complete • Minimal equipment needed.	• Difficult to assess whether each repetition is performed correctly. Difficult to accurately measure large groups.

Flexibility
Test: Sit and Reach Test
Protocol: Sit with legs straight out in front and soles of feet against box/table. Reach forward without bending knees. No jerking movements.

Advantages	Disadvantages
• Quick and easy to perform. • Data table readily available for comparison	• Can cause injury if not fully warmed up appropriately. • Only measures flexibility of lower back and hamstrings.

Cardiovascular Fitness (Aerobic Endurance)
Test: 12 min Cooper Run
Protocol: Continuously run/swim for 12 minutes. Distance recorded.

Advantages	Disadvantages
• Minimal equipment needed • Test can be self administered.	• Inaccuracy of heart rate measurements • Motivation dependant

Test: Harvard Step Test
Protocol: Step continuously for 5 minutes. Measure heart rate at 1, 2 and 3 minutes after exercise.

Advantages	Disadvantages
• Simple test to complete	• Motivation dependant

Agility
Test: Illinois Agility Test
Protocol: Start lying down at the start line. Complete course as quick as possible (10m x 5m – 4 central cones)

Advantages	Disadvantages
• Simple and easy to complete	• Motivation dependant / Timing errors.

Speed
Test: 30m Sprint Test
Protocol: Start from stationery position. Complete distance in the quickest possible time. Time is stopped when chest crosses the line.

Advantages	Disadvantages
• Quick test to complete. • Minimal equipment needed and can be performed anywhere with a flat 50m run.	• Running surfaces/weather conditions can affect the results. • Inaccuracies with stopwatch usage.

Power
Test: Vertical jump Test
Protocol: Stand next to wall and mark an initial reach while feet are flat on the ground. Standing jump to reach as high as possible. Measure distance from first mark to second.

Advantages	Disadvantages
• Quick and easy to perform. • Easy to complete with large groups.	• Technique plays are large role in successful completion.

Reliability /Validity
Validity relates to whether the test actually measures what it sets out to measure.
Reliability is a question of whether the test is accurate. It is important to ensure that the procedure is correctly maintained for ALL individuals.
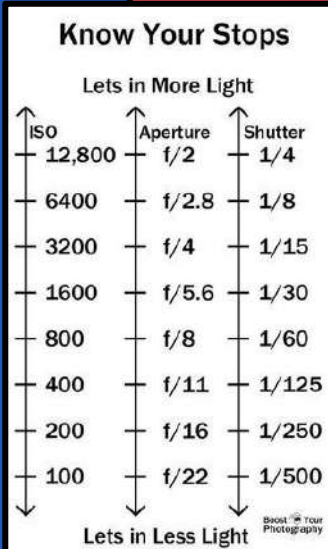
Results can be improved:
• By using experienced testers & calibrating equipment
• Ensuring performers have the same level of motivation to complete each test
• Repeatedly test to avoid human error (x3)

Composition in photography refers to **the position of objects inside the frame and how they interact with each other**. Ultimately, composition is about the visual structure of your image; the arrangement of the image.

"
Photography has nothing to do with cameras.
- Lucas Gentry
"

Know Your Stops

Lets in More Light

ISO	Aperture	Shutter
12,800	f/2	1/4
6400	f/2.8	1/8
3200	f/4	1/15
1600	f/5.6	1/30
800	f/8	1/60
400	f/11	1/125
200	f/16	1/250
100	f/22	1/500

Lets in Less Light

Boost Your Photography

EMANUELCARISTI.COM

PHOTOGRAPHY CHEAT SHEET

MANUAL MODE

EXPOSURE
KEEP THE LIGHT METER AT "0" FOR A BALANCED EXPOSURE EXPOSE FOR THE LIGHTS TO NOT BLOWN OUT THE WHITES

THIS IS ALL YOU NEED TO KNOW

- OPTIMAL EXPOSURE
- UNDEREXPOSED
- OVEREXPOSED

APERTURE
SMALLER f/STOPS REPRESENT LARGER APERTURES, MORE LIGHT THROUGH THE LENS AND SHALLOWER DOF

f/1.4 f/2 f/2.8 f/4 f/5.6 f/8 f/11 f/16

SHALLOW DEPTH OF FIELD — BRIGHTER
DEEP DEPTH OF FIELD — DARKER

SHUTTER SPEED
THE LENGHT OF TIME WHEN THE DIGITAL SENSOR INSIDE THE CAMERA IS EXPOSED TO LIGHT

1" 1/4 1/15 1/60 1/125 1/250 1/500 1/1000

LONGER EXPOSURE — BLUR ACTION / BRIGHTER
SHORTER EXPOSURE — DARKER / FREEZE ACTION

ISO
THE SENSITIVITY OF THE IMAGE SENSOR OR THE FILM TO THE LIGHT
LOW ISO TO USE DURING DAY TIME - HIGH ISO DURING NIGHT TIME

100 200 400 800 1600 3200 6400 12800

LOW SENSITIVE TO LIGHT — LOW NOISE / HIGHER QUALITY
HIGH SENSITIVITY TO LIGHT — LOWER QUALITY / HIGH NOISE

Camera Functions and Modes

M Manual Exposure — You set the shutter speed, aperture and ISO

A/Av Aperture Priority — You set the aperture, and the camera sets the shutter speed

S/Tv Shutter Priority — You set the shutter speed and the camera sets the aperture

Macro Mode — Sets a wide aperture to blur backgrounds for close up subjects

Portrait Mode — Sets a wide aperture to blur backgrounds

Sports Mode — Sets a fast shutter speed to freeze action

Landscape Mode — Sets aperture to maximum depth of field and the built in flash is turned off

Night Portrait — Combines flash with a slow shutter speed

Self Timer — Automatically sets times such as 2, 5 or 10 seconds

Flash — Selects from auto, fill-in or red-eye

Key Terms and Technical Vocabulary

MACRO - a setting on the camera that lets you focus on subjects which are very close to the camera lens

APERTURE - this is a hole or opening that controls the amount of light that comes through the camera and onto the sensor.

SHUTTER SPEED - this is the length of time that the camera's sensor is exposed to light.

SELF TIMER - a feature on a camera which counts down then takes a photo.

FLASH - A flash is a device used on a camera to artificially light up a scene

PHOTOJOURNAL - a series of photographs typically arranged chronologically to tell a story, can be accompanied by text to support the narrative.

COMPOSITION - how the visual elements in the image have been arranged or framed. The composition can be changed by moving the camera about, zooming in or out, changing a lense or changing the height of the camera, e.g crouching down.

DEPTH OF FIELD- the distance between the nearest and furthest objects giving a focussed image

FOREGROUND -the part of the image that is at the front and nearest to the viewer.

BACKGROUND - the part of the image that is at the back and furthest from the viewer.

MIDDLE GROUND - the part of the image that is in the middle between the foreground and the background.

VIEWPOINT - refers to the position the camera is in when viewing a scene e.g birds eye view is from above.

CROPPING - is the removal of unwanted areas of the image, usually the outer areas.

FOCUS- how clear the elements in the image have been displayed e.g blurry/sharp

BLURRED - whether the image/part of image is indistinct or hazy (often when the image is out of focus).

SATURATION - the intensity of colour the image holds, saturated images usually have overly bright colours.

ISO - this relates to the sensitivity of the sensor to light and is a setting that will brighten or darken a photo

Cranlington Learning Village Art Department

Symmetry

Framing

Depth of Field

Background

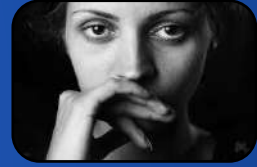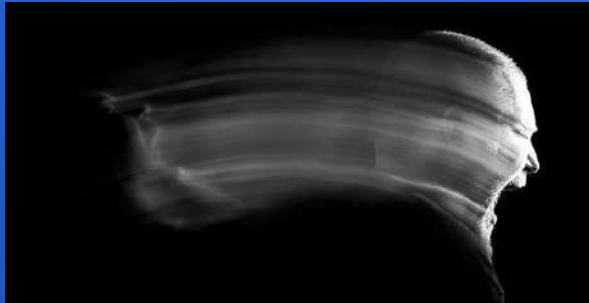Diagonal Lines

Viewpoint

Rule of Third

Leading Lines

Pattern

Colour

Negative Space

Contrast

Development Writing Frame - PHOTOGRAPHY
Using the questions/statements below, discuss your developed work. Use the sentence starters to help you.
The image that I have created is of… *describe your photography in detail: how does it respond directly to your chosen question/theme?*
The key technical factors that I have used to create this image are… shutter speed, composition, rule of thirds, focal point, aperture, lighting
This work is developed from my artist's work because in their work, they have used the idea of…. *Is it a certain style? Or a particular thing or group of things?*
and in my own work I have... *describe what you have done to change the work to make it your own, have you used a similar style but a different subject? Have you developed your photos by re-shooting to develop your work?*
I think my work is successful because…. *Describe the best elements of your work: Is it impactful? Does is evidence the technical aspects of photography like depth of field or focal point? Is it unique, different or original? Does the background work well with the piece? Have you edited it to improve? How?*
The symbolic elements of my photo convey a message by…
To refine and develop my work, I will… *Is there anything that you can do to enhance the audience interpretation, is the message explicit? Do you need to re-shoot with costumes and props? Lighting is key in photography, does the lighting need to be enhance with editing or re-shooting? Is the composition right? Do you need to edit on photoshop to enhance colours?*

Topic 3: Psychological Problems

Psychology

Mental Health

Mental health: *a person's condition with regard to their psychological and emotional well-being*
- 25% of people are likely to suffer from mental health per year
- 1.45 million people predicted to be diagnosed with depression by 2026
- People are 10x more likely to be diagnosed with depression in 1980 compared to 1940
- 27% of people who said they had used an illegal substance in their life in 2008
- 31% of people who said they had used an illegal substance in their life in 2014

Depression

Symptoms:
- Sadness
- Hopelessness
- Losing interest
- Loneliness
- Suicidal thoughts

Features:
- Women are more prone to depression
- 3.5 million people are estimated to suffer from depression in the UK
- Teenagers and 50+ years are most likely to develop depression

Causes: Genetics:
- 17 genes linked to depression
- Genetic deposition –biologically prone to a particular behavior
- *McGuffin –46% more likely to develop depression if MZ twin was diagnosed*

Causes: Cognitive:
- Cognitive Triad –negative thoughts about themselves, the world and the future
- *March –327 adolescents with a diagnosis of depression and looked at the effectiveness of CBT. After 36 weeks, 81% of the CBT group had significantly improved, demonstrating the effectiveness of CBT in treating depression and suggesting depression is due to thoughts*

Treatment: CBT:
- Patient explains their thoughts and feelings to the therapist
- Therapist begins to challenge the way the patient is thinking and shows the patient their thinking is irrational
- Therapist and patient work together to replace negative thoughts with positive and rational ones
- Patients will have to keep a mood diary

Treatment: Dugs:
- Increase the amount of serotonin and dopamine in the body
- Different types of antidepressants –SSRIs, SNRIs, MAOIs and TCAs

Addiction

Symptoms:
- Repetitive actions
- Can't stop or reduce activity
- Have to use the substance
- Physical withdrawal symptoms

Features:
- 141,646 people were treated for substance misuse between 2014-15
- 18-24 year old's most likely to be addicted
- 6% of people in the world have an internet addiction

Causes: Genetics:
- Dopamine controls reward and pleasure
- Malfunction in the DDR2 gene
- *Martinez –cocaine addicts were more likely to have particular version of dopamine receptors genes*

Causes: Learning:
- Operant conditioning –learning through consequence
- Classical conditioning –learning through association
- Social Learning Theory –learning through modelling, imitation and reinforcement
- *Bandura –children who watched a video of adults beating a doll were more likely to imitate this behavior showing we copy role models*

Treatment: CBT:
- Functional skills –looks at behavior and works out why someone is an addict
- Skills training –gives an addict the skills to overcome this e.g. how to cope with craving or say no

Treatment: Dugs:
- Reduce withdrawal symptoms
- Helps the nervous system cope without the substance by replacing it with something else to wean themselves off the substance

Psychology

Key Terms

Term	Definition
Unipolar depression	A type of mood disorder causing periods of feeling sad and lacking motivation to do everyday activities
Monozygotic twins	Twins developed from one fertilised egg that has been split into two. These are identical twins
Dizygotic twins	Twins developed from two different eggs fertilised during the same pregnancy. These are non-identical
Genetic predisposition	A biological tendency to develop a particular behaviour as a result of the genes someone has
Diathesis stress model	An explanation for depression that claims people can have a gene that makes them more likely to develop depression, but only if they face a stressful situation that triggers stressful depressive thoughts
Deterministic	Our actions come from what we are born with and what we experience; this is the opposite of having free will or free choice
Free Will	Explanations of behaviour that claim we have the ability to choose exactly what type of behaviour we want to show; this is the opposite of being determined
Cognitive theory	An explanation that focuses on how thought processes influence behaviour
Negative Triad	A set of three thought patterns where people feel bad about themselves, the world and the future
Magnification	A form of cognitive bias that makes people see their problems as far bigger than they actually are
Cognitive behavioural therapy (CBT)	A therapy for mental health disorders that aims to change thought processes in order to reduce symptoms.
Neurotransmitter	Chemicals found within the nervous system that pass messages from one neuron to another
Noradrenaline	A type of neurotransmitter that is involved in mood and is released during time of stress
Reuptake	The process where a neuron reabsorbs neurotransmitters that they have released
Placebo	An inactive substance or "fake pill" used instead of an active substance. The person given a placebo will not know it is fake
Relapse	A return of symptoms after treatment has been given
Addiction	A mental health problem that means people need a particular thing – a substance or an activity – in order to be able to go about their normal routine
Withdrawal	A set of unpleasant symptoms someone gets when they cannot satisfy their addiction. Normally happens when people are trying to quit.
Functional analysis	The first stage of CBT to treat addiction – this identifies the triggers
Skills training	The second stage of CBT where the addict learns to control their patterns of behaviour that lead to their addiction
Detoxification	When an addict tries to stop taking the substance they are addicted to
Longitudinal study	The same set of people are studied over a long period of time
Likert-style question	A numerical scale which is used to quantify people's opinions on different things.
5HTT gene	Short alleles lead to higher rates of depression (Caspi)

Studies:

Young
- Participants went through an online CBT programme.
- The sample included 114 patients (66 males and 48 females)
- The first session focused on finding out background information of the participant and their disorder

e.g. problems at home, work or school and when their symptoms started, what type of symptoms
- The next sessions focused on skills training by getting the participant to develop skills to treat the symptoms

e.g. stop using online apps or spending online
- The participants had to complete questionnaires after the 3rd, 8th, 12th sessions and again 6 months after the programme.

e.g. rate your ability to control you computer use from 1-5
- Participants went from 4.22 motivational score up to 4.36 after 6 months

Caspi
- A group of children were studied since birth (longitudinal study)
- 847 children in total
- Participants completed a questionnaire that looked at life events from 21st-26th birthday
- Participants with at least one gene (5-HTT) AND had stressful life events has more signs of depression
- Participant with the short gene were more likely to become depressed than those with the long gene
- Those with 2 short genes were more likely to be severely depressed

Topic 3: Psychological Problems
Paper 1 - 16 Marks
Combination of 1,2 and 4 mark questions
Possible topic for a 9 mark question on Paper 1

Spanish

¿Cómo te llevas con tu familia? *How do you get on with your family?*

Me llevo bien con *I get on well with*	mi abuelo/-a	my grandad / grandma
	mi cuñado	my brother-in-law
	mi hermano	my brother
Me llevo mejor con *I get on better with*	mis hermano	my siblings
	mi hermanastro/-a	my half brother / sister
	el hijo de mi hermana	my sister's son
Me llevo mal con *I get on badly with*	mi madre	my mother
	el marido de mi padre	my father's husband
Me llevo peor con *I get on worse with*	mi nuera	my daughter-in-law
	mi padre	my father
Discuto con *I argue with*	mi primo	my cousin
	mi sobrino/-a	my nephew / niece
Fastidio a *I annoy*	mi tío/-a	my uncle / aunt
	mi yerno	my son-in-law

¿Qué haces normalmente con tu familia? *What do you normally do with your family?*

Suelo *I usually*	**celebrar fiestas con** *celebrate parties with*	el bebé de mi hermanastro	my half brother's baby
		mi cuñada	my sister-in-law
	charlar con *chat with*	el esposo de mi hermana	my sister's husband
		la esposa de mi tía	my aunt's wife
	cuidar de *look after*	mi gemelo	my twin
		mi madrastra	my step-mum
	hacer de canguro de *babysit*	mi padrastro	my step-dad

¿Cómo es tu familia o amigo? *What is your family or friend like?*

Mi hermano mayor *My girlfriend* **Mi mejor amigo** *My (male) best friend*	es *is*	

adolescente	adolescent
atrevido	adventurous
irritante	annoying
mandón	bossy
obediente	well behaved
perezoso	lazy

Mi familia *My family* **Mi novia** *My girlfriend* **Mi amiga** *My (female) friend*	es *is*	

encantadora	charming
habladora	chatty
honrada	honest
simpática	friendly
terca	stubborn

Mis abuelos *My grandparents* **Mis hermanos** *My brothers*	son *are*	

amables	kind
desagradables	nasty
engreídos	conceited
generosos	generous
honrados	honest
leales	loyal
traviesos	naughty

Worked example

Me llevo muy bien con mi familia porque es encantadora. Suelo charlar mucho con mi padre y mis dos hermanastros, aunque a veces discuto con mi madre ya que es un poco terca. Además me encanta celebrar fiestas con mis abuelos porque siempre son amables.

DAILY LIFE: EATING OUT

Spanish

¿Qué prefieres comer? *What do you prefer to eat?*

Prefiero desayunar	cereales	cereals
For breakfast I prefer to have	fruta	fruit
	unas galletas	some biscuits
	leche entera	full fat milk
	una manzana	an apple
	pan	bread
	un plátano	a banana
	una taza de café o cacao	a cup of coffee or cocoa
	un zumo de frutas	a fruit juice
Me gusta almorzar	unos albaricoques	some apricots
For lunch I like to have	arroz con salchichas	rice with sausages
	un bocadillo de atún	a tuna sandwich
	un filete de cerdo	a pork steak
	judías verdes	green beans
	pollo con patatas fritas	chicken with chips
	una sopa de guisantes	a pea soup
	una tortilla	an omelette
	una zanahoria	a carrot
Me encanta cenar	albóndigas con salsa	meatballs with gravy
For dinner I love to have	una chuleta de cordero	a lamb chop
	una ensalada de pepino	a cucumber salad
	una hamburguesa	a burger
	queso y uvas	cheese and grapes
	verduras asadas	roasted vegetables

¿Qué comiste ayer? *What did you eat yesterday?*

Ayer Yesterday			
	Desayuné	cerezas	cherries
	For breakfast I had	un huevo frito	a fried egg
		un melocotón	a peach
		un pastel de chocolate	a chocolate cake
		una tostada con mantequilla	a toast with butter
	Almorcé	carne picada de ternera con champiñones	beef mince with mushrooms
	For lunch I had	coliflor con jamón	cauliflower with ham
		una comida deliciosa	a delicious meal
		un plato principal	a main course
		pescado con limón	fish with lemon
	Cené	una ciruela	a plum
	For dinner I had	una comida precocinada	a ready meal
		un panecillo con pimientos	a roll with peppers
		una pera y piña	a pear and pineapple
		un pomelo	a grapefruit
		una tarta de cebolla	an onion tart
	Bebí	agua mineral	mineral water
	I drank	una cerveza	a beer
		un chocolate caliente	a hot chocolate
		refrescos	refreshments
		un té	a tea

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Spanish

¿Qué ropa llevas normalmente? *What clothes do you normally wear?*

Me gusta llevar
I like to wear

Me encanta ponerme
I love to put on

Suelo llevar
I usually wear

Siempre llevo
I always wear

A veces me pongo
Sometimes I put on

unas botas	boots
una camisa blanca	a white shirt
una chaqueta de lana	a wool jacket / blazer
una falda	a skirt
un pantalón negro	black trousers
una rebeca	a cardigan
ropa de deporte	sports clothes
ropa de moda	fashionable clothes
una sudadera	a sweatshirt
unos zapatos marrones	brown shoes

¿Qué llevaste el finde pasado? *What did you wear last weekend?*

Llevé
I wore

Me puse
I put on

un abrigo	a coat
un anillo	a ring
una bata	a dressing gown
un chándal holgado	a loose tracksuit
un jersey elegante	a smart jumper
un pantalón corto	some shorts
un polo de marca	a branded polo shirt
una pulsera	a bracelet
unos vaqueros	some jeans
un vestido de seda	a silk dress
unas zapatillas de deporte	some trainers

¿Qué compraste ayer? *What did you buy yesterday?*

Ayer compré
Yesterday I bought

Me probé
I tried on

un bañador	a swimsuit
una barra de labios	a lipstick
un bolso de cuero	a leather bag
unas bragas	briefs
una bufanda de rayas	a striped scarf
unos calcetines	socks
unos calzoncillos	boxer shorts
un cinturón	a belt
una corbata de lunares	a spotted tie
una gorra y un reloj	a cap and a watch
unas joyas	jewellery
unas medias	tights
un paraguas	an umbrella
unos pendientes	earrings
un pijama de algodón	cotton pyjamas
un sujetador	a bra
un traje de lino	a linen suit
unas zapatillas	slippers

en el centro comercial
in the shopping centre

en la tienda
in the shop

en la joyería
in the jeweller's

en el probador
in the fitting room / changing room

en la zapatería
in the shoe shop

Worked example

Por lo general suelo llevar ropa cómoda, por ejemplo unos vaqueros y una camiseta básica, aunque el finde pasado fue el cumpleaños de mi tía y me puse un polo de marca. Ayer fui de compras y compré una falda de terciopelo, pero la talla es pequeña - ¡qué desastre!

1. What fabric is the skirt they bought?

2. What is the word for 'size' in Spanish?

THEME 1: IDENTITY AND CULTURE

DAILY LIFE: SOCIAL MEDIA AND TECHNOLOGY

Spanish

¿Utilizas mucho el móvil? *Do you use your phone a lot?*

¡Por supuesto! Suelo
Of course! I usually

Sí, me encanta
Yes, I love

Por las tardes suelo
In the afternoon I usually

Bueno, a veces me gusta
Well, sometimes I like

No suelo
I don't usually

¡Qué va! Odio
No way! I hate

cargar contenido	to load content
charlar en línea	to chat online
conectarme a internet	to connect to the internet
descargar música	to download music
escribir mensajes	to type messages
escuchar música	to listen to music
enviar correos electrónicos	to send emails
grabar audios	to record audios
guardar fotos	to save photos
mirar páginas web	look at websites

¿Qué hiciste ayer en internet? *What did you do yesterday on the internet?*

Escribí un blog
I wrote a blog

Leí una página web
I read a website

Leí un post de Instagram
I read an Instagram post

sobre
about

la seguridad en las redes sociales
security in social networks

el uso de las redes sociales
the use of social networks

el acoso cibernético
cyber bullying

el trabajo de los programadores
the job of programmers

Usé la cámara web para hacer una videoconferencia
I used the webcam to do a videoconference

Llamé por FaceTime a mi amiga y charlé con ella
I called my friend on FaceTime and I chatted with her

¿Qué es lo bueno de las redes sociales? *What is good about social networks?*

Lo bueno es que
The good thing is that

Lo mejor es que
The best thing is that

son
they are

accesibles	accessible
divertidas	fun
educativas	educational
entretenidas	entertaining
fáciles de usar	easy to use
útiles	useful

Una ventaja es que
An advantage is that

te permiten
they allow you

comunicarte con la gente	communicate with people
estar en contacto	to be in contact
subir fotos	upload photos

Lo malo es que
The bad thing is that

son
they are

adictivas	addictive
controvertidas	controversial
peligrosas	dangerous

Lo peor es que
The worse thing is that

te enganchan
they get you hooked

Una desventaja es que *A disadvantage is that*

te pueden enganchar
they can get you hooked

Worked example

¿A quién no le gusta usar las redes sociales en el móvil? Por las tardes me encanta conectarme a internet y mirar las fotos que sube mi amiga a Instagram. En mi opinión, todas las aplicaciones son fáciles de usar aunque a veces pueden ser peligrosas. Lo malo es que el móvil no está permitido en mi insti.

What is their opinion about phone apps?

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Spanish

Lifestyle: Entertainment and leisure

Useful verbs 🎵

cantar	to sing
collecionar	to collect
descansar	to relax
divertirse	to enjoy yourself
encontrarse con/quedar con	to meet
escuchar música	to listen to music
gastar dinero	to spend money
ir de compras	to go shopping
jugar	to play
leer	to read
practicar	to practise
salir	to go out
tocar un instrument	to play an instrument
ver la tele	to watch TV

Time phrases ⏰

ayer	yesterday
anoche	last night
hoy	today
mañana	tomorrow
este fin de semana	this weekend
ahora	now
el año/la semana/el mes que viene	next year/week/month
en el pasado	in the past
el año/el fin de semana/el viernes pasado	last year/weekend/ Friday
cuando era más joven	when I was younger
en el futuro	in the future
hace un mes/dos meses	a month/two months ago

Useful connectives ✎

antes (de)	before
después (de)	after
pero	but
porque	because
ya que	since
sin embargo	however
incluso	even
entonces	then
mientras	while/meanwhile
aunque	although
aún (si)	even (if)
también	also
además	what's more

Useful adjectives 💬

aburrido	activo	informativo	relajante
divertido	educativo	cómico	emocionante
entretenido	estimulante	fascinante	repetitivo

e.g. Me encanta escuchar música porque es relajante
Prefiero las películas de amor porque son divertidas

¿Qué haces en tu tiempo libre?	En mi tiempo libre ... voy ... hago ... me gusta ...
¿Qué vas a hacer este fin de semana?	Este fin de semana voy a hacer/haré ... voy a ir/ iré ...
¿Qué hiciste la última vez que saliste con tus amigos?	Salimos ... fuimos ... hicimos ...
Si tuvieras más tiempo, ¿qué harías con tu tiempo libre?	Me gustaría ... haría ... iría ...
¿Te gustaría ir a una clase/ aprender algo nuevo?	Sí, quiero aprender a... me encantaría ...
¿Qué pasatiempos hacías en el pasado?	Cuando era más joven, hacía ... me gustaba ...
¿Los hobbies son importantes para los jóvenes?	Creo que son esenciales para una buena salud mental porque ayudan a evitar el estrés.

¿?

Music, TV and films

el anuncio	advert
la comedia	comedy
el concurso	quiz show
el dibujo animado	cartoon
el documental	documentary
las noticias	news
la serie policiaca	detective series
la telerrealidad/el programa de realidad	reality show
la telenovela	soap opera
el programa de cocina/deporte/música	cookery/sport/music programme
las películas de acción	action films
las películas de amor/las películas románticas	romance films
las películas de comedia	comedies
las películas de ciencia-ficción	science-fiction films
las películas de terror	horror films
las películas de guerra	war films
la música clásica	classical music
la música de los años ochenta	'80s music
la música pop	pop music
el rock/jazz/rap	rock/jazz/rap

Gustar and encantar 👍

Remember that the verbs **gustar** and **encantar** don't work in the same way as other verbs:

Use **gusta/encanta** for single things or an activity (using a verb) e.g. *me gusta el rock, me encanta ir de compras.*

Use **gustan/encantan** for two or more things e.g. *me gustan las telenovelas, me encantan las comedias.*

Use **me** when you are talking about things you like and **le** when you are talking about what someone else likes e.g. *a mi hermana le gusta leer*. Use **mucho** to say you like something a lot e.g. *me gusta mucho tocar la guitarra*.

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Youth Culture: Self and relationships

Using different tenses ⏱

Make sure you can say:
- what you usually do with your friends and family e.g. **normalmente salimos … vamos … hacemos …**
- what you did last week e.g. **la semana pasada salimos … fuimos … hicimos …**
- what you are going to do next week e.g. **la semana que viene vamos a salir/saldremos … vamos a ir/iremos … vamos a hacer/haremos …**

Adjectives to describe personality ✏

contento	divertido	generoso
travieso	alegre	honrado
abierto	triste	tímido
sincero	feliz	hablador
amable	perezoso	estricto
creativo	sociable	trabajador
egoísta	cariñoso	simpático
serio	molesto	antipático

Remember that your adjective endings will need to agree with the person you are describing e.g. **mi hermana es cariñosa, mis hermanos son traviesos** etc.

Describe a tu familia.	En mi familia hay …
Describe a tu mejor amigo/a.	Mi mejor amigo/a se llama … tiene … es … le gusta(n) …
¿Cómo sería tu novio/a ideal?	Mi novio/a idea sería … tendría … haría …
¿Cuáles son las cualidades de un/a buen/a amigo/a?	Un/a buen/a amigo/a debería ser …
¿Admiras a alguna celebridad?	Admiro a … porque es una persona …
¿Te interesa la moda?	En mi opinión, la moda es … porque …
¿Qué vas a hacer dentro de diez años?	En el futuro …tengo la intención de … me gustaría …

Friends and family 👥

Mi	Mis
familia	mejores amigos/as
mejor amigo/a	
novio/a	padres
madre/madrastra	hermanos/as
padre/padrastro	abuelos
hermano/a	tíos
hermanastro/a	primos
abuelo/a	sobrinos
tio/tía	
primo/a	
sobrino/a	

Other people

las celebridades/los adolescentes/los jóvenes/los padres/los mayores/los viejos/los demás/la gente (singular)

Useful phrases 💬

Me llevo bien/mal con …	I get on well/badly with …
Nos llevamos muy bien/mal	We get on very well/badly
Me parezco a …	I look like ….
Mis padres no me dejan …	My parents don't let me …
Cuando era más joven …	When I was younger …
Cuando sea mayor …	When I am older …
Tenemos mucho en común	We have a lot in common
Mi celebridad preferida es …	My favourite celebrity is …

Talking about other people

Remember to use the 3rd person (plural or singular) to talk about other people:

Mi madre/mi hermano/mi amiga etc. (singular)		Mis padres/mis hermanos/ mis amigos etc. (plural)	
es	is	son	are
era	was	eran	were
tiene	has	tienen	have
se llama	is called	se llaman	are called
le gusta(n)	likes	les gusta(n)	like
le encanta(n)	loves	les encanta(n)	love
odia	hates	odian	hate
piensa	thinks	piensan	think
dice	says	dicen	say
lleva	wears	llevan	wear

Ser and estar

Remember that both **ser** and **estar** mean **to be** but they are not the same – you will need to use both of them a lot when talking about self and relationships.

Use ser for physical descriptions (**soy alto/a**), personality and character (**es generoso/a**) and nationality (**es español/a**).

Use **estar** for feelings/ moods/ emotions (**mi hermano no está contento**) and marital status (**mis abuelos están divorciados**).

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Spanish

(el) baloncesto

(el) fútbol
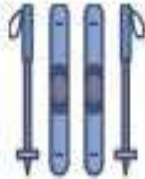
(el) tenis

(el) bádminton

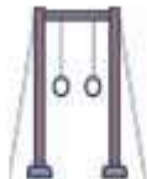(el) béisbol

(el) ciclismo

(el) golf

(el) hockey

(el) esquí

(el) voleibol

(la) gimnasia

(el) billar

- Deportes de pelota/balón (ball sports): el fútbol, el baloncesto, el tenis, el golf, el béisbol, el voleibol, el balonmano, el tenis de mesa

- Deportes acuáticos (water sports): la natación, el remo, el buceo, el surf

- Deportes de montaña (mountain sports): el senderismo, la escalada, el montañismo

- Deportes de aventura (adventure sports): el paracaidismo, el parapente, el puenting, la tirolina, la espeleología

- Deportes de fuerza (strength sports): la halterofilia, el levantamiento de peso y el atletismo de fuerza

- Deportes de motor (motor sports): el automovilismo y el motociclismo

- Deportes de tiro (shooting sports): el tiro con arco y el tiro olímpico