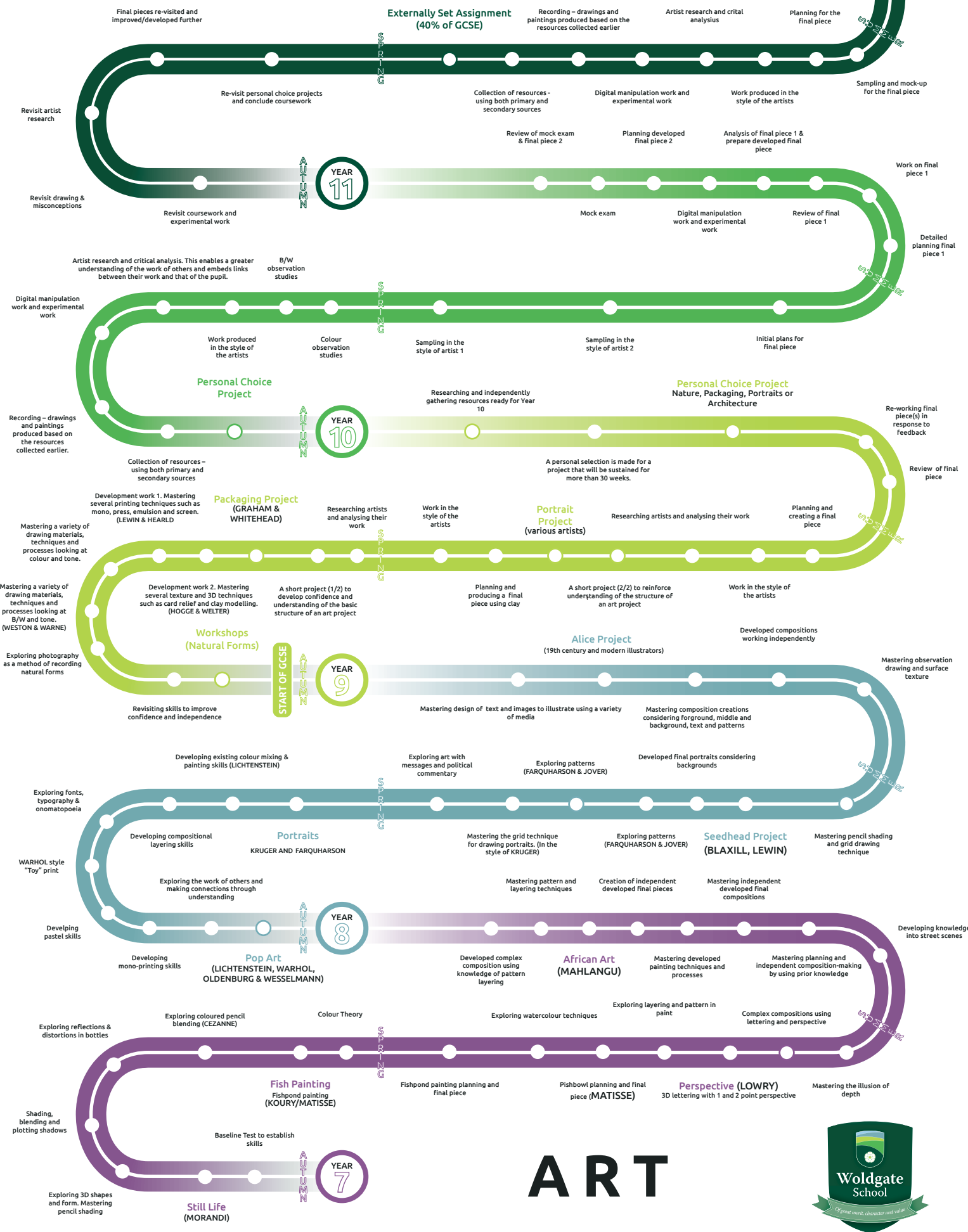




GCSE EXAMINATIONS

Final piece produced under exam conditions (10 hours)



ART



LINE

TO NE

SHAPE & FORM

COLOUR

TEXTURE

PATTERN

Key Words

Primary Source

This is when a piece of work is produced after drawing or photographing something first hand ie your own photographs.

Secondary Source

This is a piece of work that was created later by someone who did not experience the event first-hand. ie internet photographs

Observation drawings

Drawing from objects first hand
Tone

The lightness or darkness of something. Tone or shading can help 2D shapes look 3D

Composition

The way in which something is arranged or placed.

Critical Review/Annotations

This written work expresses your opinion on whether something has work well or badly. Comment on your work as it progresses.

Challenge Task:

Make sure that you include some of your own photographs (primary source photos) in Personal Choice Project

Needed in Artist Research:

ARTIST NAME

IMAGES OF ARTISTS WORK

BE SELECTIVE AND MAKE SURE THE IMAGES ARE GOOD QUALITY

ANALYSIS OF ARTIST WORK – SEE ANALYSIS QUESTIONS

YOUR OPINION – HOW ARE YOU GOING TO DEVELOP THIS INTO YOUR WORK?



PERSONAL CHOICE PROJECT MOODBOARDS AND RESOURCES

It is important to show evidence of lots of research that you have done based on your choice of topic. This shows you have imagination, ambition and creativity. Photos are important (primary and secondary) as well as other images that might be useful to you such as from magazines or leaflets from visits.

ARTIST RESEARCH X2

Research at least 2 artists that are relevant to your

1. DESCRIBE WHAT YOU SEE?

2. WHAT DO YOU THINK THE ARTIST IS INSPIRED BY?

3. WHAT MATERIALS & TECHNIQUES DO YOU THINK THE ARTIST HAS USED?

4. WHAT DO YOU LIKE ABOUT THE ARTISTS WORK?

5. CRITICALLY REVIEW WHAT WORKS WELL?

6. COMPARE & CONTRAST MULTIPLE ARTIST PIECES

7. PERSONAL RESPONSE
HOW ARE YOU TAKING INSPIRATION FROM ARTIST WORK?

8. GIVE YOUR OPINION ABOUT THE ARTISTS WORK

DRAWINGS FROM MOODBOARD PICTURES

Use a variety of materials, techniques and processes. This will show off a wide variety of skills. Use black and white (B/W) as well as colour.



Select your question (theme):

**PORTRAIT
INTEGRATE
PLACES & SPACES
CURVED & STRAIGHT
FRAGMENTS
IMAGE & WORD**

You will be producing the following:

Title page
Mood board/images
Artist Research X 2
Drawings – B/W
Drawings – Colour
Digital Manipulations and development drawings
Work in the style of artist 1
Work in the style of artist 2
Planning for final piece
Sampling for final piece
Mock-up of final piece
Final piece
Developed Final piece 3





GCSE EXAMINATIONS

Revision and Exam Preparation

Paper 1 – Influences of operations and HRM on business activity

Paper 2 – Influences of marketing and finance on business activity

Analysing the financial performance of a business

Marketing

Segmentation

Elements of the marketing mix

Promotion and distribution

Financial terms and calculations

Identifying & understanding customers

Purpose and methods of market research

Using the marketing mix: product and pricing

Cash Flow

Finance

Developing Mathematical Understanding

YEAR 11

Sources of finance

Breakeven calculations

Training

Technology

Environmental Considerations

Globalisation

The competitive environment

Recruitment and selection of employees

Motivating employees

External Influence on Business

Ethical Considerations

The economic climate of Business

Legislation

Human Resources

Good customer service

The role of procurement

YEAR 10

Organisational structure

The concept of quality

Production processes

Business ownership

Setting Business aims and objectives

Business location

Expanding a Business

Business Operations

Stakeholders

Business planning

The purpose & nature of Business

Business In the Real World

Introduction to Business

START OF GCSE

YEAR 9

BUSINESS STUDIES (GCSE)



3.5.1 / 2 - Identifying & understanding customers & Segmentation

A **Market** consists of all the sales of one particular group of goods or services. For example, the grocery market, the housing market, or the stock market.

In every market, businesses must identify and satisfy customer needs. This is the purpose of **Marketing**. All businesses work hard to identify and satisfy customers needs in order to:

- Provide a product or service that customers will buy
- Select the correct **Marketing Mix**
- Avoid costly mistakes
- Be competitive and increase sales

$$\text{Market Growth} = \frac{\text{change in market size}}{\text{original market size}} \times 100$$



The same way we would break up an orange, we **segment** a market.

Segmentation allows businesses to focus on individual groups, such as gender, age groups, geographic location, levels of income.

Businesses will **target segments** where it thinks:

- ✓ It can be profitable
- ✓ It can compete effectively
- ✓ It covers the opportunity costs

By doing this, we can better understand the different groups of consumers we might be targeting. That way we can design products, pricing, advertising, and ways of delivering the product, that suit each group.

Benefits of accurate segmentation	Drawbacks of segmenting / risks of doing it badly
Businesses design better products, advertising, and prices, and promotions, which lead to more sales.	Detailed research will be required – this can be expensive
Understanding our customer better, we can predict what they may want in the future.	It can be very difficult to accurately predict what a customer will like or dislike
We can maximise the profit from each group – for example, knowing that some people have no choice but to use the train at a set time, means we could charge a higher price.	All of our competitors will be trying to do the same thing, meaning that if we don't do it well they will be able to gain a significant advantage over us.

3.5.3 - The purpose and methods of market research

Market Research is the process of a business collecting information that will help it to better compete with its opposition. It enables a business to gain a better insight into the market and its conditions and then are in a better position to make decisions.

Purposes of Market Research – businesses collect information about:

Demand	Competition	Target Market
How much/which products do consumers want/need? What features should their product have and what price should they set?	How are the competitors in the market operating? How are they different to us, and how are they innovating?	Who are our customers? What specific wants/needs to they have? Can we improve how we deal with them to increase sales?

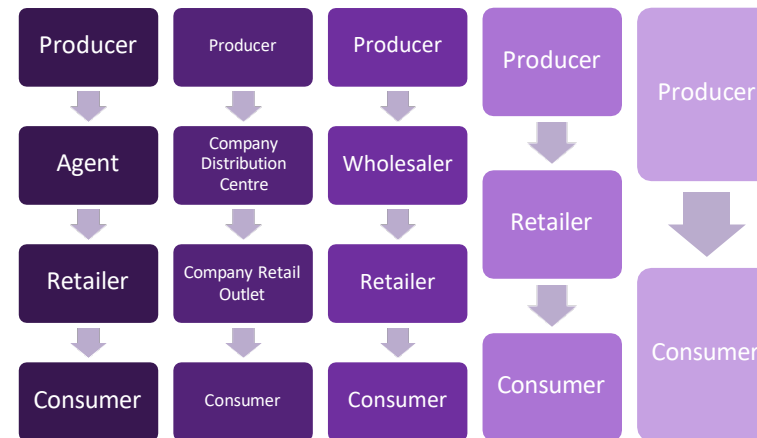
Primary	Secondary	Quantitative	Qualitative
Research I design and conduct specifically for my business	Research someone else has designed and conducted	Data that is numerical / can be counted	Information that is descriptive and cannot be easily counted

Method	Advantages	Disadvantages
Questionnaires & Surveys	Easy / cheap to produce	Difficult to get responses May be leading questions
Interview	Detailed information as more time to ask further questions	Time consuming and so expensive
Focus Group	Opportunity for discussion More detailed responses	Time consuming Groups may not be representative
Internet Research & Printed Media	Lots of information available Cheap (Secondary Research)	Information can be misleading Others designed the research / may not be suited to your purpose

$$\text{Market share} = \frac{\text{sales of a product}}{\text{total market sales}} \times 100$$

3.5.4 - The Marketing Mix: Place

Place refers to the different channels of distribution a business uses to get their products to the customers.



In each of the possible scenarios show above, the seller might choose a range of ways to sell to the buyer:

- Traditional – via a shop / office
- Modern retail – using technology to improve the process (i.e. self-scan/checkout)
- Telesales – sales made by phone direct to the customer
- E-commerce / M-Commerce – sales via a website or app
- Mail-order – produce catalogues and customers order from them

Choosing the right method of getting the product to the customer is vital.

AQA GCSE Business

Marketing

Unit 5

Appears in:
Paper 2



3.5.4 - The Marketing Mix: Promotion

Promotion is the name given to all of the business activities that encourage the customer to buy a product.

Why we promote	How we choose a method
It's important to promote a product, especially when it's new or if it is in a market where there's lots of competition. It's used to:	What a businesses chooses to do to promote their product is influenced by both internal and external factors:
<ul style="list-style-type: none"> - Inform/remind customers about the product - Create or increase sales - Create or change the image of the product - Persuade customers to buy or try the product 	<ul style="list-style-type: none"> - Finance available to spend - What the competitors in the market are doing - The type of good or service the product is - The nature of the market and how competitive it is - Who the target market are

Advertising	PR	Sales Promotion	Sponsorship	Social Media
These are the types of adverts you would be familiar with on TV, Radio, in newspapers, on the internet and on billboards	Public Relations events and activities are the ones that change how we think about a business. For example, some give to charity.	Special offers and displays. 2 for 1 and BOGOF, free gifts, coupons, samples, competitions.	Businesses often sponsor football teams or sporting events. The same as they might sponsor a good cause such as a school.	Interacting with customers via social media is increasingly important to modern business. It involves the customer in the brand.

3.5.4 - The Marketing Mix: Price

Businesses set prices for their products based on a range of **internal** and **external** factors.

- ✓ Costs associated with the product e.g. fixed / variable costs
- ✓ Demand e.g. what are people willing and able to pay.
- ✓ Nature of the market e.g. competitive (rivals)
- ✓ A business's objective and approach to pricing
- ✓ The stage a product is at in its product life cycle e.g. growth phase – higher price
- ✓ Rest of the marketing mix e.g. price must fit with the other elements of the 4 p's.



Skimming	Description: Setting a higher price when a product is released Potential Impact: The company can try to take advantage of excitement around the release of the product – with customers willing to pay more to get the product sooner the company can recover some of its Research and Development costs e.g. new iPhone
Penetration	Description: Setting a price lower than the competition for a short time Potential Impact: By pricing below the competition a company can attempt to increase their share of the market. If their product is new, or if they are entering this market for the first time, it could encourage customers to try the product or switch from a competing product. E.g. Netflix
Competitive	Description: Pricing alongside or similarly to the competition Potential Impact: By pricing alongside our rivals, customers will see our price as the "going- rate" – the normal price. We shouldn't be seen as expensive, and so customers are less likely to go elsewhere simply because of the price. E.g. petrol / diesel
Loss Leader	Description: Setting a price for a product that means a loss is made on each sale Potential Impact: A very low price on a product may encourage people to visit the shop, and subsequently buy other items that do make a profit. E.g. printers cheap, ink cartridges higher price
Cost-Plus	Description: Adding a percentage profit to the cost of producing/selling a product Potential Impact: Provided we sell enough units for us to cover our fixed costs, each unit sold should make a profit. Set the price so that each sale covers its own variable costs.

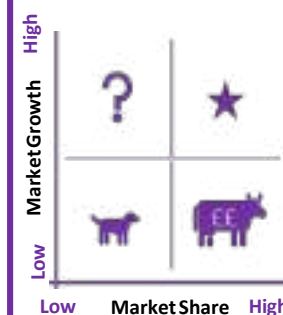
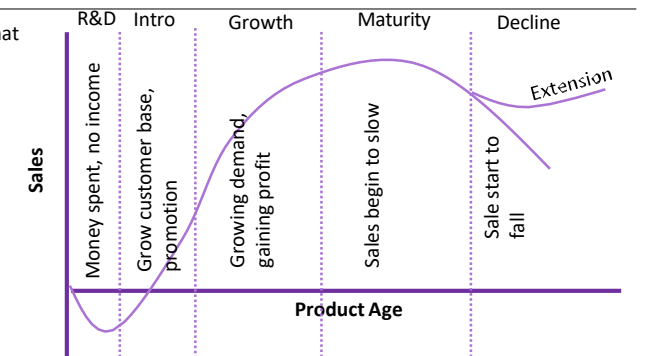
3.5.4 - The Marketing Mix: Product

Deciding which products to offer is a marketing activity. There are risks and benefits of releasing new products and discontinuing old ones. Which products are sold and their quality, will affect **brand image**.

Having a **unique selling point** can improve sales in competitive markets.

The **Product Lifecycle** shows the stages that a product is likely to go through during its lifetime. It also shows how decline is not inevitable, and that **extension strategies** could be used to avoid the decline phase.

- Extension strategies include:
- ✓ Update the packaging
 - ✓ Target new customers
 - ✓ Add more features
 - ✓ Spend more on advertising
 - ✓ Cutting the price
 - ✓ Trying to encourage more purchases on more occasions



Question marks

Market is growing fast, need to spend money on promotion, cant guarantee success.

Dogs

Products are not much use, either get rid or try to improve them.

Stars

Market is fast growth, keep improving them to turn them into cash cows.

Cash cows

Well known products, can gather revenue with little promotional expense now.

The **Boston Matrix** is a tool for analysing a product's share and growth in the market. A **product portfolio** is the collection of products that a firm produces.

Where a product appears in the matrix might help us to decide what to do next to improve our profitability.

Businesses want a balanced portfolio of products e.g. Cash cows help finance question marks/stars.


5

AQA GCSE Business

Marketing

Unit 5

Appears in:
Paper 2



Key Term	Definition
Advertising	Communicating with the customer to inform them about / convince them to buy a product
Boston Matrix	A way of analysing a product's share and growth in the market
Brand Image	How the brand is seen by the customer, their perception of its strengths, weaknesses, personality. It changes over time and all of the customers' interactions with the brand will inform it.
Cash cow (Boston matrix)	Product has a high market share in a low growth market
Competitive Pricing	Setting a price to be in line with a competitors' price for the same or similar products.
Complementary Product	A product that is sold alongside another that may be of use or interest to a customer. For example, extended warranties alongside the checkouts at CurrysPCWorld.
Cost-Plus Pricing	Adding a percentage to the cost of producing a product so that a profit is made.
Customer Engagement	How the business tries to build a relationship with the customer in order to build loyalty.
Direct Marketing	Occurs when there is a direct link from the producer to the customer with no intermediaries
Distribution Channels	How the ownership of a product passes from the producer to the final customer
Dog (Boston matrix)	a product that has a low market share in a low growth market
EPOS	Electronic Point of Sale. A till / checkout that will automatically update stock / print coupons and vouchers etc.
Extension Strategies	Methods that extend the lifecycle of a product. Such as, updated packaging, adding new or different features, changing target market, special offers, advertising, and price reduction.
Focus Group	A group of people chosen from the target market to discuss a product. Provides the business with qualitative data relating to their opinions.
Intermediary	Is a link in the distribution chain between the producer and the customer
Loss Leader pricing	A product sold for less than it costs in order to encourage more customers to buy other items.
Market Research	Process of gathering, analysing and processing data relevant to marketing decisions.
Marketing	The activities within a business that combine to ensure the customer gets what they want, in the quantities they want, at a price they are willing to pay.
Marketing Mix	The four areas of marketing, and how a company uses them in combination to meet the needs and wants of customer while maximising sales, revenue and profit.
Market segment	A group of buyers with similar needs within the overall market

Key Term	Definition
Penetration Pricing	Launching a new product at a low price to achieve fast sales.
Point of Sale	The place in a store, or webshop that the customer buys the product. Often an opportunity to attempt to sell complementary products.
PR – Public Relations	The act of managing the relationships between the business and wider groups. For example, environmental groups, pressure groups or investors. All with the aim of improving brand image.
Price skimming	Setting a high price for a product when it first enters the market
Primary Research	Designing your own research, then collecting the information first-hand. Also called field research.
Product Differentiation	Developing features within a product that set it apart from other products in the same market. Using these differences to help promote the product and convince customers.
Product Lifecycle	The stages a product goes through from initial idea to removal. Research and Development > Introduction > Growth > Maturity > Decline (Extension).
Product Portfolio	The collection of products that a firm produces
Promotion	Communicating with customers in order to inform / remind them about a product or persuade them to buy.
Qualitative Market Research	Collecting information about customers' thoughts/opinions about a product – customers are able to explain in detail.
Quantitative Market Research	Collecting information in a numerical manner – less detail is possible, but statistical analysis is easier.
Question mark (Boston matrix)	A product has a low market share in a fast growth market
Retailers	A shop that sell direct to the customer
Sales Value	Measures the revenue generated from sales.
Sales Volume	Measures the number of items sold.
Secondary Research	Using sources of information that have already been collected / published. Also called 'desk research.'
Segmentation	Dividing a market into groups that can be more easily targeted with specific products / adverts / prices. It enables the business to meet the needs and wants of a specific group more easily.
Star (Boston matrix)	A product has a high market share in a fast growth market
Telesales	Attempting to sell products by phone.
Unique Selling Point (USP)	The main benefit / key feature of a product that differentiates it from the other products in the same market.
Wholesaler	A business that sells in large quantities, usually buying them from manufacturers, then selling to retailers.



GCSE EXAMINATIONS

2 GCSE Exam Papers

Revision

Search with SQL

Purpose and functionality of systems software

Programming languages

Functions of the OS

Files, fields and attributes

Sort with SQL

Operating systems

Translators and facilities of languages

Utility system software

Structured Query Language

Logic

RAM and ROM

CPU components and their functions

CPU

YEAR 11

Structured data

Truth tables

Types of storage and their suitability

Storage and memory

Hardware

Data mine

Sorting algorithms

Networks

Hardware

Transmission methods

Protocol stack

VPN

Library code

Searching algorithms

Trace tables

Types of networks, PAN, LAN, WAN

Protocols

Addressing

WiFi

Algorithms

Compression

Using Binary data

Use of data types

Data

Functions

Ascii Art

Using Hexadecimal data

Analog

Data types

Negative numbers in computing

Hex

Algorithms

Producing algorithms

Chat app

Lists

Converting between number bases

Maths for Computer Science

Computational thinking

Story game

Types of error

Quiz host

Pixels, resolution and colour depth

YEAR 9

Number bases – decimal binary and hexadecimal

Analysing data

The investigative cycle

Using software to visualise data sets

Sound editing

Image editing

Digital images

Representations going audiovisual

Layers of computing systems

Hardware

Operating systems

Artificial Intelligence

Introduction to Python programming

Using assignment statements

Using binary selection

Boolean variables

Locating and correcting syntax errors

Operations on strings

Representations going audiovisual

Using data

Collecting data

Modelling data using spreadsheets

Algorithms and programs

Logical expressions

Multi-branch selection

Python Programming with sequences of data

Operations on lists and items

Using iteration

Using variables to track counts and sums

YEAR 8

Making calculations on a spreadsheet

Spreadsheets

Developing an app

GUI elements

Programming using scratch

Paths

Manipulating shape

Media vector graphics

Credibility of sources

Networks

Wired and wireless networks

Programming using scratch

Sequence and variables

Iteration

Website building blocks

Searching the web

Word processing

Promoting a cause

Networking hardware

The internet

Programming essentials

Operators

Developing for the web

Shortcuts

Navigating the web

Using Media to gain support for a cause

Branding

Digital Media

YEAR 7

Presenting

Adding content

Getting the message across

COMPUTING



Problem Solving With Code (Planning Stage 1)

1. Really understand the problem. Can you explain it in plain English?
2. Diagram the problem, start trying to break it down into basic constructs such as input, output, process, selection and iteration.
3. Turn your basic idea into something more concrete by making flow diagram. It will probably help at this stage if you consider each process to be a subroutine. That way you know each of them probably contains multiple steps.
4. Now look at your overall diagram. Check the loops. Do all your processes and inputs/outputs sit inside the loop? If so start by coding the loop since everything will sit inside it. Otherwise start with the first process/subroutine.
5. Look at the process/subroutine, can it be done with a single Python Command? If it can what is that command? If it can't, break the problem down further until it can be done with a single command.
6. Make new flow charts for each of the subroutines you just broke down

Problem Solving With Code (Code Stage)

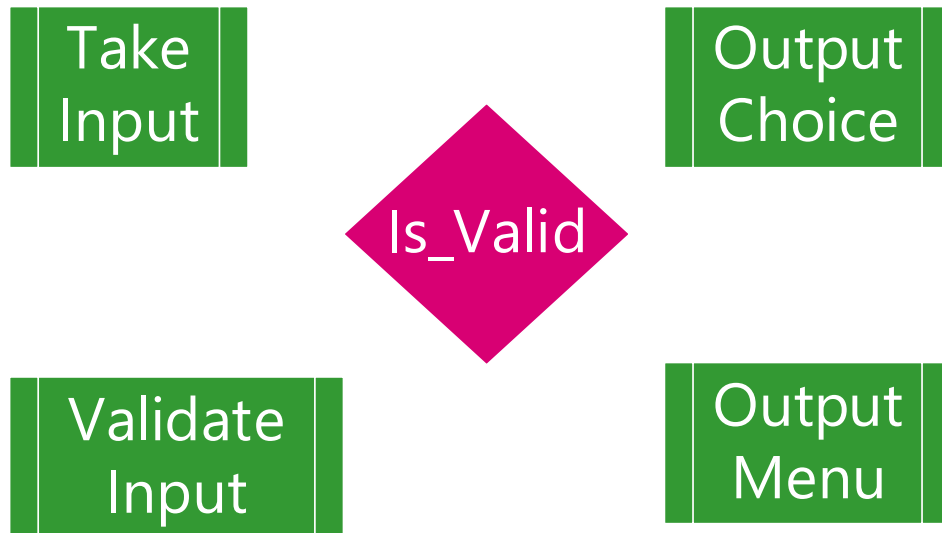
1. Are you in a good place to start coding? Have your plans been broken down enough that each process is a single command, if not go back.
2. Start to write the code. Do one subroutine at a time.
3. Use the IntelliSense in the IDE to help you with syntax.
4. Write using subroutines then you can test them individually to make sure it gives you the expected output.
5. Test each stage.
6. If it's an exam and you can't quite do one bit, make it a subroutine, explain what should happen in the subroutine using comments.
7. Coding is supposed to be modular, you build it up in sections like building wall.

Problem Solving With Code - Example P1

Problem To Solve:

Create a menu for a burger restaurant.

It should be displayed,
The user should have a way to choose
The input must be validated as an item
on the menu
The program should never crash



Breaking it down:

Start with the basics

- You need to output a menu to the screen
- You need to take user input
- You need to validate the input
- You need to make some kind of loop encase validation fails.
- You need an output to confirm a correct menu choice

Make each stage a subroutine and put the flow chart symbols down. Don't worry about the order, just add them to a document.

Remember selections and loops both use decision diamonds.

Problem Solving With Code - Example P2

Problem To Solve:

Create a menu for a burger restaurant.

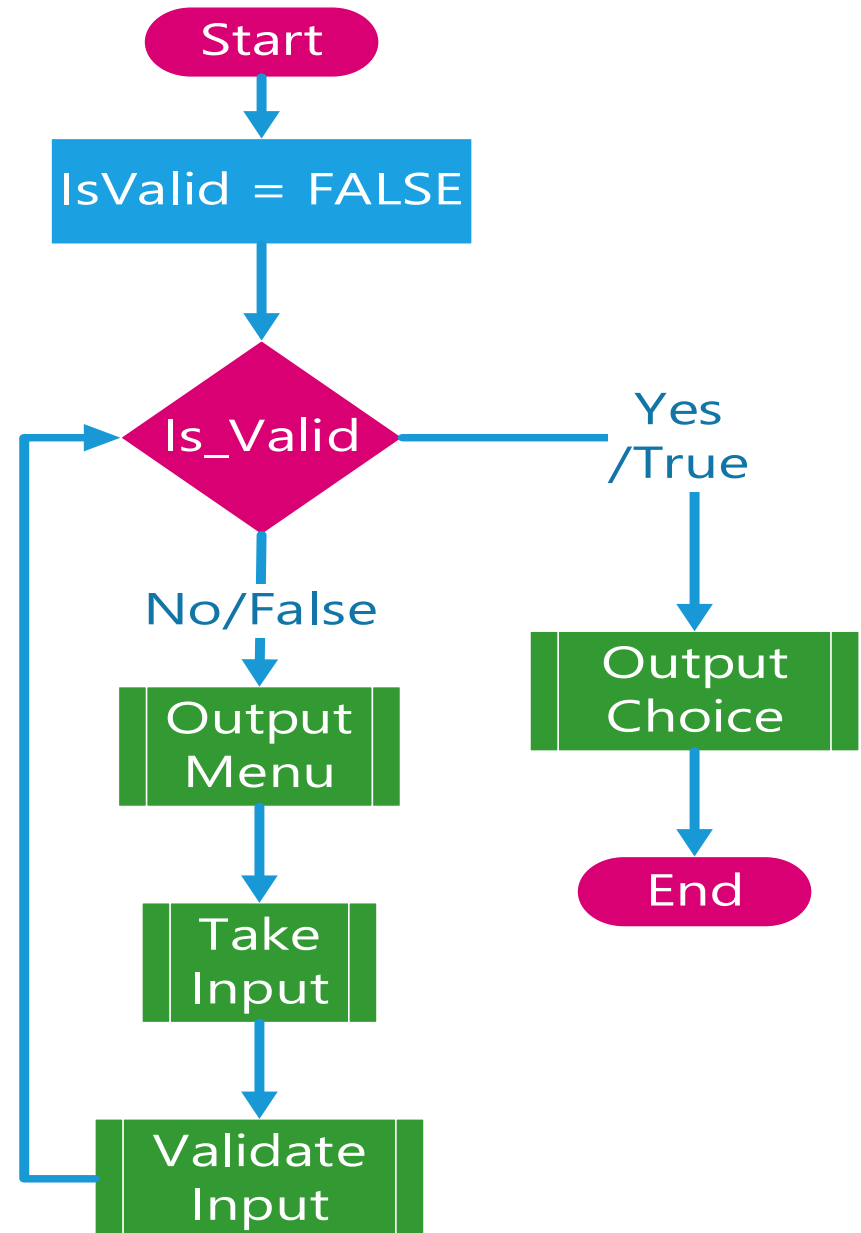
It should be displayed,

The user should have a way to choose
The input must be validated as an item
on the menu

The program should never crash

Now is time to arrange them into some kind of order. Still using this high level thinking for now.

Everything now happens inside the loop.
This way if validation fails the menu is given again. Covering both types of validation needed



Problem Solving With Code - Example P3

```

def output_menu(): 1 usage
    # Do something here to build the menu
    menu = "my menu"
    print(menu)

def take_input(): 1 usage
    # do stuff here
    choice = input("Enter your choice: ")
    return choice

def validate_input(user_input): 1 usage
    # do stuff here to validate the input,
    # valid will end up as true or false
    valid = True
    return valid

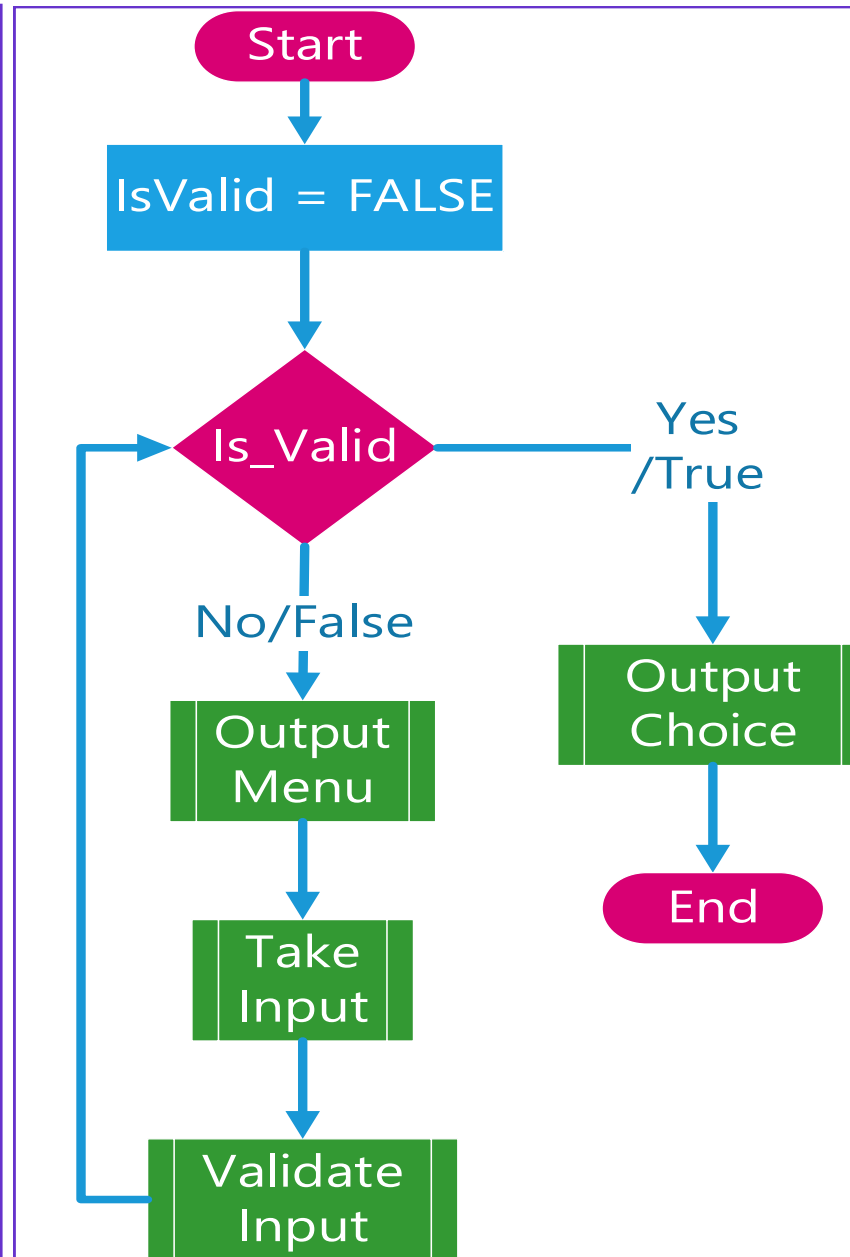
def output_choice(user_choice): 1 usage
    print(user_choice)

isValid = False
choice = ""

while not isValid:
    output_menu()
    choice = take_input()
    valid = validate_input(choice)

output_choice(choice)

```

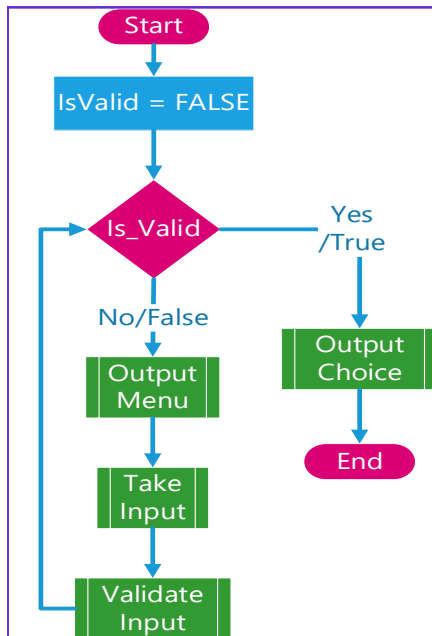


Now lets think about how this will look in code before starting to break each subroutine down further.

It might be that some subroutines are replaced by single print statements yet.

Notice all the # comments? Those are places we will break each stage down further.

Problem Solving With Code - Ex P3 Explained



```

def output_menu(): 1 usage
    # Do something here to build the menu
    menu = "my menu"
    print(menu)

def take_input(): 1 usage
    # do stuff here
    choice = input("Enter your choice: ")
    return choice

def validate_input(user_input): 1 usage
    # do stuff here to validate the input,
    # valid will end up as true or false
    valid = True
    return valid

def output_choice(user_choice): 1 usage
    print(user_choice)

isValid = False
choice = ""

while not isValid:
    output_menu()
    choice = take_input()
    valid = validate_input(choice)

output_choice(choice)
  
```

- Declare the boolean variable used to test for validity and set it to false. This means the first time the while loop condition is checked it will enter.
- Declare the variable to store the users choice, it must be declared here because its needed after the loop exits
- Write the while loop that keeps looping while isValid is false.
- Add the subroutine names inside the while loop
- Now write each of the subroutine definitions above the original code.
- Make sure you pass in parameters and return them appropriately.

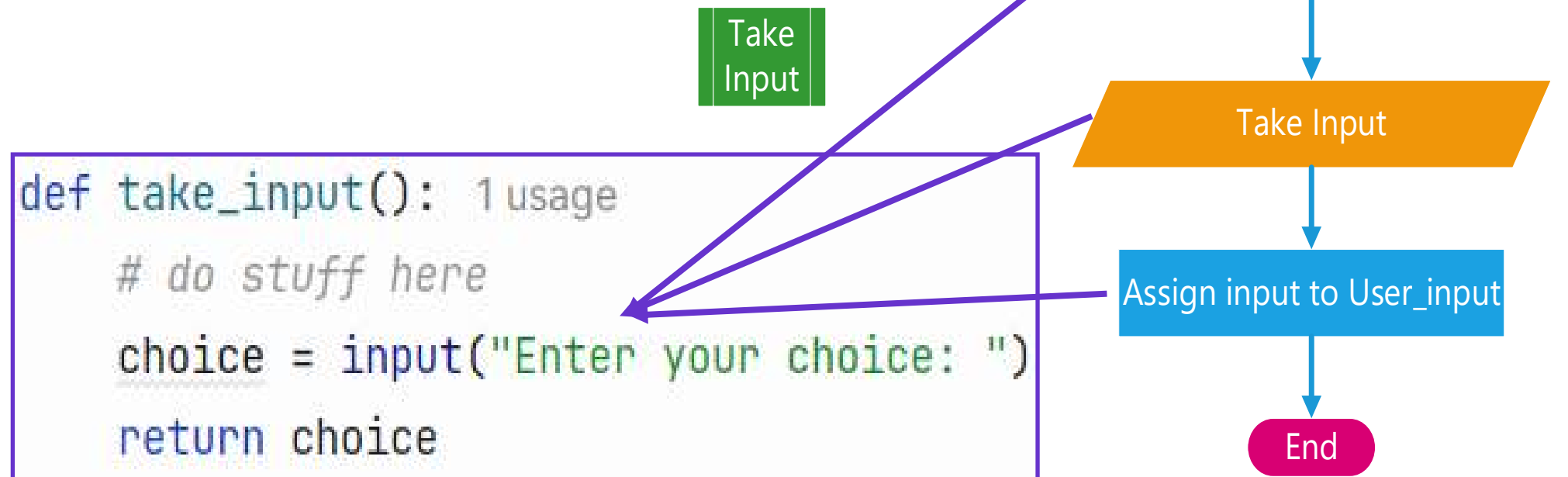
You now have the skeleton code that everything else will be added into.

Problem Solving With Code - Example P4

Breaking down take_input

Take input could become a single process since all it needs is one user input for this case.

For simplicity of the diagram will leave it as a subroutine and add in the breakdown.



Problem Displaying the menu— Lets Think Storage

Most menus display data in tabular format.

E.g. Item Code Name Price

This information fits very well into a list.

We can also use a list to give each item a unique number. Re- member each list element has an in- dex number.

This can visualised as a list of lists.

Item1	Item2	Item3	Item4	Item5	
0	1	2	3	4	Index


Each element is a list of its own
Item list Example

Item	Description	Price	
0	1	2	Index

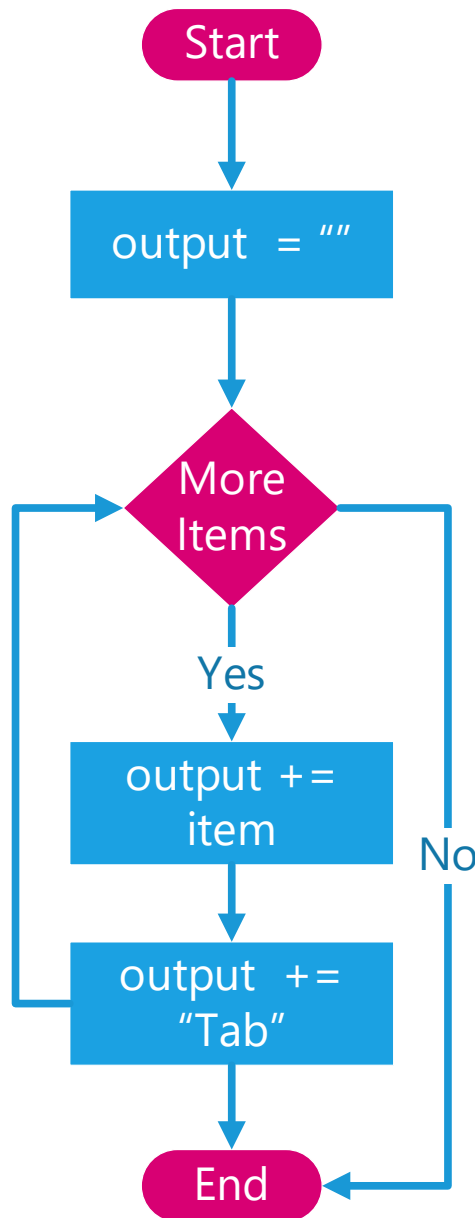
Now we have created a nice structure for our data we can start to think about how to output this data.

A nested loop is a nice way of doing this. Find an example on the next page

[[[
Item,	Item,	Item,
Description,	Description,	Description,
Price	Price	Price
]]]
0	1	2



Creating the menu line p1



Conceptually we can visualise creating the string for each item as its done on the left.

Start with an empty string.

If another item exists concatenate the item

Concatenate a tab character

This can be turned into a subroutine

At the end add a line return.

```

def generate_item_line(items):
    line = ""
    for item in items:
        line += item
        line += "\t"
    line += "\n"
    return line
  
```

- Declare an empty string
- Loop through each element.
 - Inside the loop. Concatenate (join) the element contents to the string
 - Concatenate the tab character with “\t”.
- Add a line return at the end with “\n”

Creating the menu line p2—refine the code

```
def generate_item_line(items):  
    line = ""  
    for item in items:  
        line += item  
        line += "\t"  
    line += "\n"  
    return line
```

```
def generate_item_line(items):  
    line = ""  
    for index in range(0, len(items)):  
        line += items[index]  
        if index != len(items) - 1:  
            line += "\t"  
    line += "\n"  
    return line
```

This Code is ok but it also needs refining.

After each item name, it adds a tab character.

But there should be no tab character after the last item.

This can be changed by adjusting the loop type then checking to see if the item is the last in the list.

For this we can use a for range loop.

The last elements index is always one less than the number of elements.

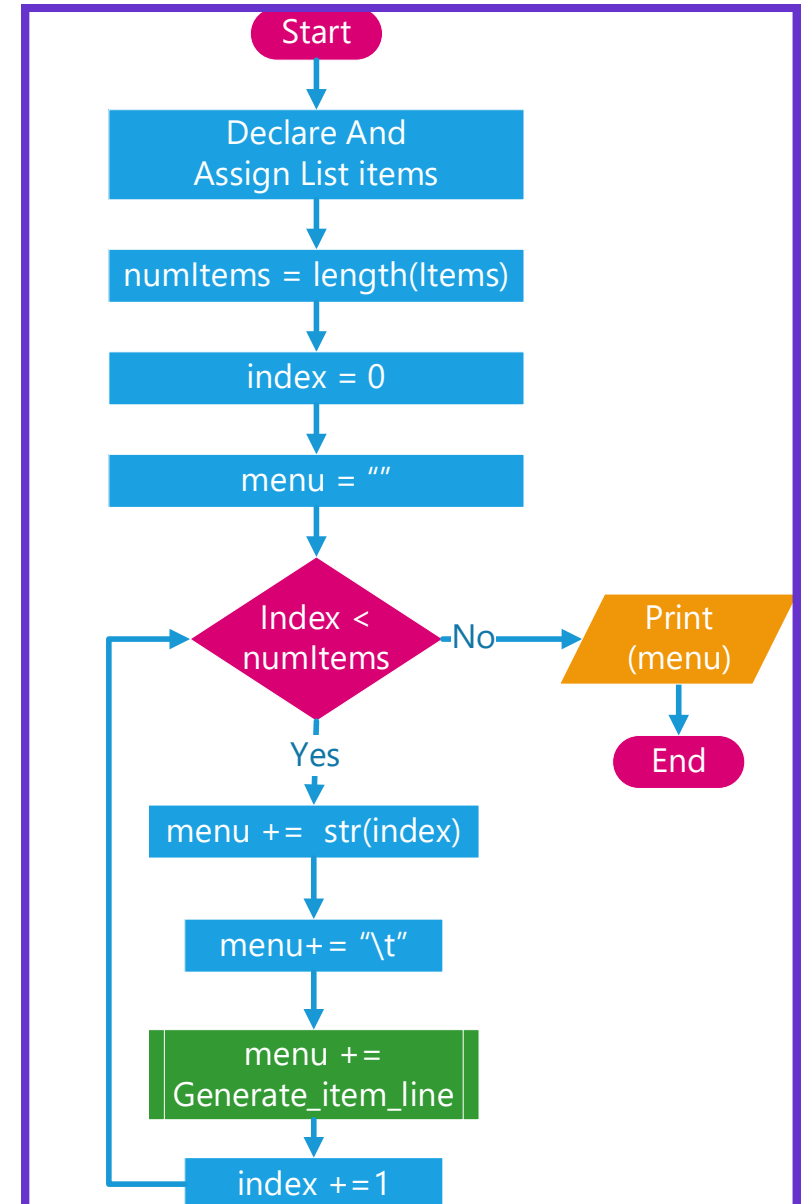
The Len function returns the length of a list. The first index is always zero.

Creating the menu string

The subroutine above generates the text for each item.

Now we need to think about looping through each item on the menu. Adding a number so people can choose an option.

```
def generate_menu(menu_items):
    menu = ""
    for index in range(0, len(menu_items)):
        menu += str(index)
        menu += "\t"
        menu += generate_item_line(menu_items[index])
    return menu
```



Validating The Input – 1/3

First we need to consider what needs validating.

The requirements state the program should never crash.

It also states the value entered must be a valid menu item.

This means we must make sure the menu number entered can be cast to an integer AND that the integer is within the length of the menu items list.

For this we can write two more subroutines.

The first to test if the input can be cast and the second to test if its in range

Then it needs combining into a loop so the menu is returned if not valid.

```
def validate_is_int(user_input):  
    try:  
        int_value = int(user_input)  
    except (ValueError, TypeError):  
        return False  
    else:  
        return True
```

The above code tries to cast the users input to an integer.

If the cast is successful it returns a boolean value of True,

Otherwise it returns False.

Validating The Input – 2/3

First we need to consider what needs validating.

The requirements state the program should never crash.

It also states the value entered must be a valid menu item.

This means we must make sure the menu number entered can be cast to an integer AND that the integer is within the length of the menu items list.

For this we can write two more subroutines.

The first to test if the input can be cast and the second to test if its in range

Then it needs combining into a loop so the menu is returned if not valid.

```
def validate_in_range(user_input, menu_items):  
    int_value = int(user_input)  
    in_range = bool(0 <= int_value < len(menu_items))  
    return in_range
```

This code casts the user input from a string to an integer. We know this is safe due to previous testing.

Then it checks to see if the value between 0 and the last index. The last index is always one less than the length. So we just need to check that the value is less than the list length.

This means we can put value in between the highest and lowest

Zero is always less than or equal to the value and the value is always less than the list length if its valid.

The boolean version of this test is True if the value is in range. Other wise it will be false.

Validating The Input – 3/3

Now to combine both validation subroutines into a single subroutine that accounts for both.

This subroutine now needs two parameters. The user input and the list of menu items.

First it uses the `validate_is_int` subroutine to check if casting the input to an integer is possible.

Only if casting worked does it then test to see if the value is in range

Finally there is another if statement to check that both `is_int` AND `in_range` are TRUE. The result of that is stored in `valid_entry`

The `valid_entry` boolean is then returned.

```
def validate_input(user_input, menu_items): 1 usage
    is_int = validate_is_int(user_input)
    in_range = False
    if is_int:
        in_range = validate_in_range(user_input, menu_items)
    valid_entry = is_int and in_range
    return valid_entry
```

Bringing it all Together.

This brings us all the way back to the start.

There is a boolean initially set to False for is valid, meaning the loop always enters first time.

Then we output the menu, which is build inside the subroutine

Then we take the users entry

Then we validate the enter, if its not valid display the menu again.

If it is valid exit the loop

Output the users choice.

```
isValid = False
choice = ""
menu = []

while not isValid:
    output_menu()
    choice = take_input()
    valid = validate_input(choice, menu)

output_choice(choice, menu)
```

Three Tasks Left!

1. Add data to the list menu
 2. Write a nice confirmation output subroutine
 3. Link up menu generation and output
- Keep Reading for the last bits.

Output The Users Choice at the end

```
def output_choice(user_choice, menu_items): 1 usage
    int_index = int(user_choice)
    list_menu_line = menu_items[int_index]
    str_menu_line = generate_item_line(list_menu_line)
    print("You ordered: " + "\n" + str_menu_line)
```

The `output_choice` subroutine now has two parameters. The first for the input choice and the second for the menu its self.

First it casts the user entry to an integer, which we know is safe, if the code got this far.

Second it gets the list containing the item name, description etc from the menu

Third uses the subroutine `generate_item_line` to make a nicely formatted string

Finally it prints the confirmation to the console.

```
def output_menu(list_menu): 1 usage
    str_menu = generate_menu(list_menu)
    print(str_menu)
```

Use the `generate_menu` subroutine to make the string to print.

Print the string

You now have just one step left.

Keep reading!!

Adding Data To the Menu List – The End!

[Item, Description, Price]	[Item, Description, Price]	[Item, Description, Price]
0	1	2

Remember the menu is a list of lists.

Each item is a list that contains a Name, Description and Price.

The easiest way is as shown below, though it could all be done inline like the example to the left.

```
titles = ["Name", "Description", "Price"]
item1 = ["Burger", "+Fries", "£1.99"]
item2 = ["Coke", "Small", "£2.99"]
menu = [titles, item1, item2]
```

Final Full Code

```

def output_menu(list_menu): 1 usage
    str_menu = generate_menu(list_menu)
    print(str_menu)

def take_input(): 1 usage:
    user_input = input("Enter your choice: ")
    return choice

def validate_input(user_input, menu_items): 1 usage
    is_int = validate_is_int(user_input)
    in_range = False
    if is_int:
        in_range = validate_in_range(user_input, menu_items)
    valid_entry = is_int and in_range
    return valid_entry

def validate_is_int(user_input): 1 usage
    try:
        int_value = int(user_input)
    except (ValueError, TypeError):
        return False
    else:
        return True

def validate_in_range(user_input, menu_items): 1 usage
    int_value = int(user_input)
    in_range = bool(0 <= int_value < len(menu_items))
    return in_range

def output_choice(user_choice, menu_items): 1 usage
    int_index = int(user_choice)
    list_menu_line = menu_items[int_index]
    str_menu_line = generate_item_line(list_menu_line)
    print("You ordered: " + "\n" + str_menu_line)

```

```

def generate_item_line(items): 2 usages
    line = ""
    for index in range(0, len(items)):
        line += items[index]
        if index != len(items) - 1:
            line += "\t"
    line += "\n"
    return line

def generate_menu(menu_items): 1 usage
    menu = ""
    for index in range(0, len(menu_items)):
        menu += str(index)
        menu += "\t"
        menu += generate_item_line(menu_items[index])
    return menu

isValid = False
choice = ""

titles = ["Name", "Description", "Price"]
item1 = ["Burger", "+Fries", "£1.99"]
item2 = ["Coke", "Small", "£2.99"]
menu = [titles, item1, item2]

while not isValid:
    output_menu(menu)
    choice = take_input()
    valid = validate_input(choice, menu)

output_choice(choice, menu)

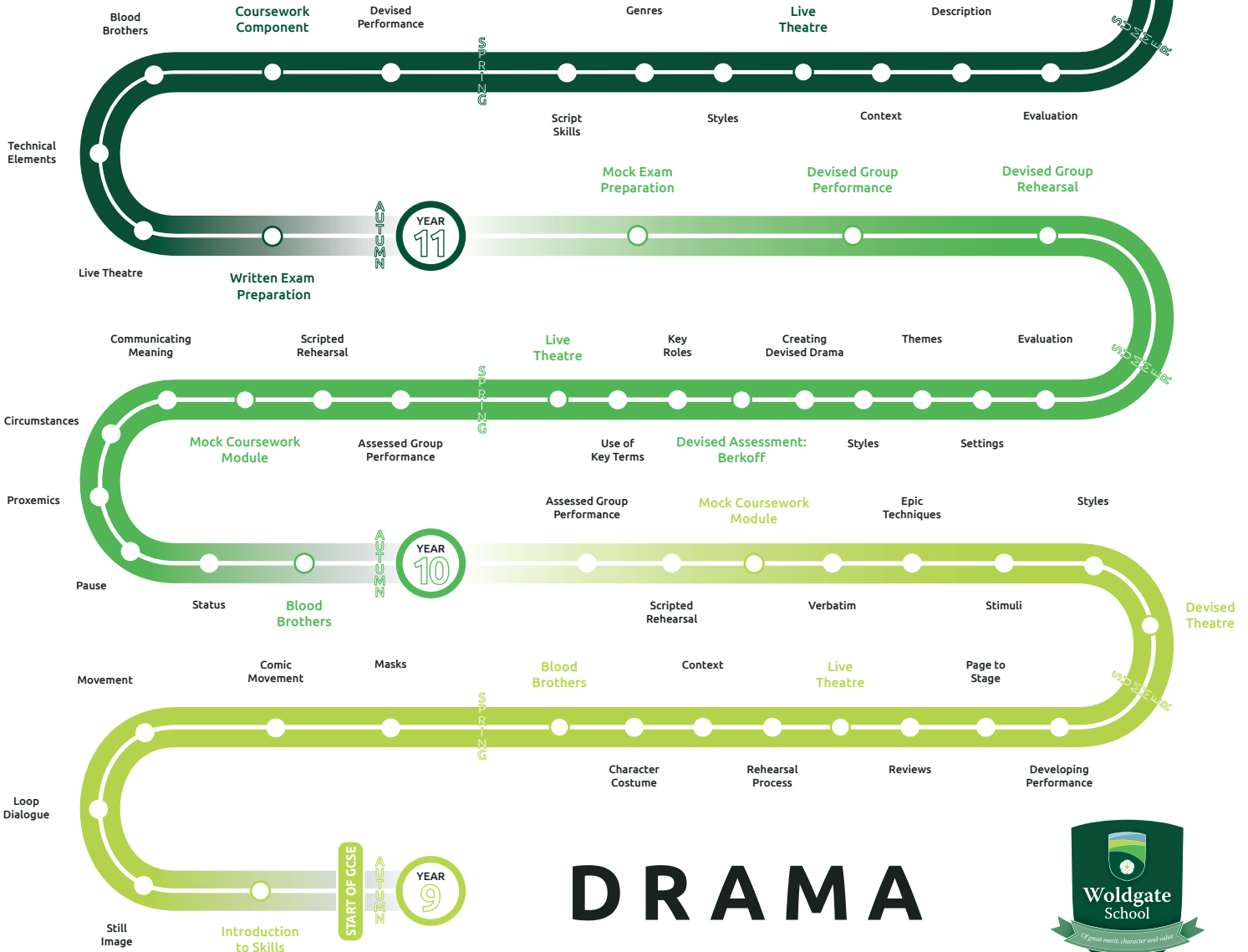
```



GCSE EXAMINATIONS

Rehearsal and Performance Exam

1 Written Paper



DRAMA

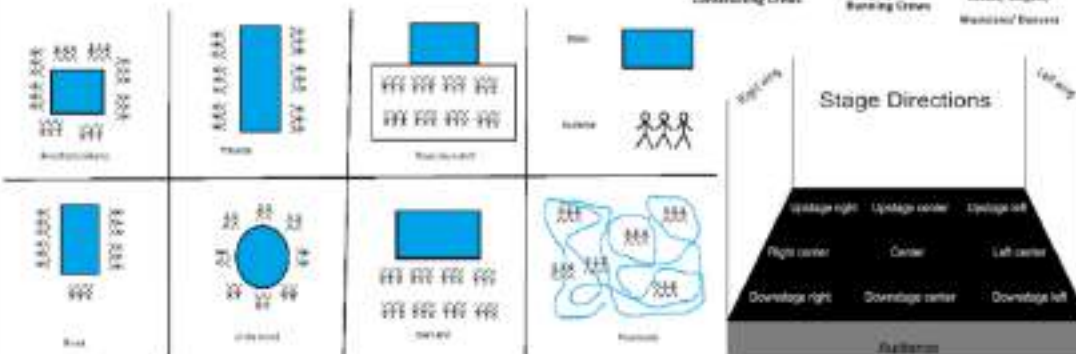


Terminology and job roles

Definitions, descriptions and understanding of the industry

Multiple choice questions (4 marks)

Quick answers for quick marks



Plot development, characters, acting skills

4 marks	DESCRIBE	→ Design of set/costume/lighting/sound
8 marks	EXPLAIN	→ A quote to hypothetically perform
12 marks	LINK	→ A section of the script to hypothetically perform
20 marks	WIDER LINK	→ A scene to hypothetically perform with a link to the whole text relevant

Vocal Skills	Physical Skills	Spatial
Pitch	Body language	Stage positioning
Pace	Posture	Proxemics
Tone	Gait	Entrances
Emphasis	Facial expression	Exits
Accent	Eye contact	Movement
Pause	Gesture	
Projection	Stillness	



Section B: four questions on a given extract from the set play chosen (44 marks)



AQA GCSE Drama Component 1: Section C Knowledge Organiser

One question (from a choice) on the work of theatre makers in a single live theatre production (32 marks)

Describing the production 12 marks	Analysis and evaluating the production 20 marks
In as much detail as you can	Using language like 'effective', 'successfully' and 'impact'
Can the reader physically act out what you've described? No? More detail is needed!	Have you made judgements? Are they justified?
Include physical skills and vocal skills	Are you backing up your analysis with evidence from the context of the play?
Don't discuss design elements	Speak as an audience member (this is different to Section B where you have studied the text)

National Theatre



Describe

Give an account in words to help the reader visualise or understand the concept or topic.

This is... This looks like... This begins... The significant elements are...



Analyse

Break down the content of a topic or issue, into its constituent elements in order to provide an in-depth account and convey an understanding of it.

The evidence demonstrates... The importance is... This shows that...



Evaluate

Consider several options, ideas or arguments and come to a conclusion about a topic/issue/subject.

In my opinion... My judgement... On reflection... It is probable... I believe...

AQA GCSE Drama Component 2: Devising - Knowledge Organiser



FRANTIC ASSEMBLY



Assessment Criteria	
A01	Create ideas that have a symbolic meaning
A02	Use drama skills/techniques to portray your message
A03	Show that you know and have understood how theatre is performed and how the message is being portrayed to the audience
A04	Say what went well and could have been better (and explain your reasons why) in your performance AND other people's performance. Identify symbolic meaning behind each technique

Type	Performance duration
Duologue (two performers)	Must be between three and ten minutes
Group performance (three or more performers)	Must be between four and twenty minutes

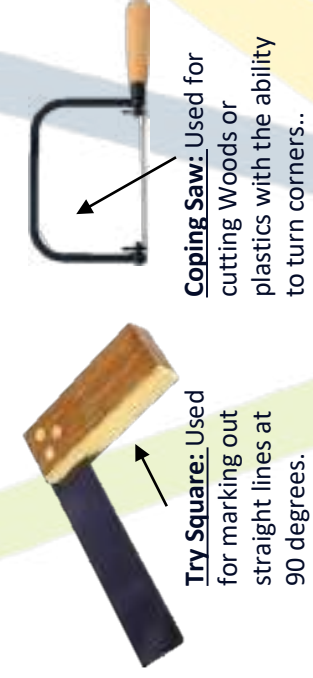
Devising Log (60 marks)

- Section 1 → Respond to a stimulus
- Section 2 → Development and collaboration
- Section 3 → Analysis and evaluation



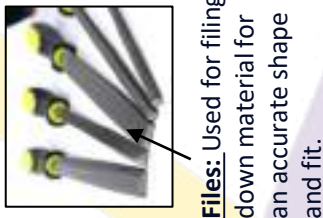
HARDWOOD vs SOFTWOOD	
Features	Softwood
Durability	Wood from soft trees, long years to grow
Quality	Generally less dense and heavier than hardwood
Strength	Softer grain, resulting in higher growth rings
Usability	More resistant to water, decay, and weathering
Uses	More varied and complex grain patterns
	Smaller and more uniform grain patterns
	Stronger, longer-lasting products, tables and chairs

	Hardwood	softwood
leaves	Broad leaves	needles
Evergreen / deciduous	Deciduous (loses leaves in Autumn)	Coniferous (evergreen)
growth	Slow growing- broad	Faster growing – tall and thin
Cost of wood	expensive	cheaper



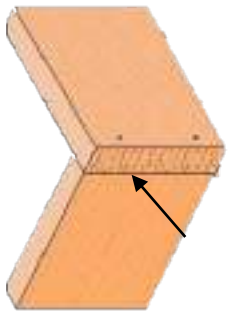
Try Square: Used for marking out straight lines at 90 degrees.

Coping Saw: Used for cutting Woods or plastics with the ability to turn corners..



Files: Used for filing down material for an accurate shape and fit.

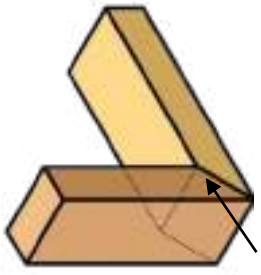
A **butt joint** is when two pieces of wood are connected end-to-end without any special cuts and connected using glue, nails or screws. Butt joints are weak.



Finger-joints are used to join short pieces of wood form longer ones. "Fingers" of wood are cut and held together with glue. Finger joints are strong with a larger surface area.



HARDWOODS			
Ash	Birch	Cherry	Walnut
Hickory	Maple	Red Oak	White Oak



A **mitre joint** is a joint made by cutting each of two parts at a 45° angle, to form a corner, usually to form a 90° angle. They are used in picture frames and are weak.

SOFTWOODS	
Pinus	Fir
Spruce	Cedar



MDF STRUCTURE
Compressed wood fibred, mixed with adhesive.



PLYWOOD STRUCTURE
(odd number of thin layers of wood, glued together)

Plywood is a composite material manufactured from thin layers, of wood veneer that have been stacked and glued together. It is a manufactured board. The sheets of wood are stacked such that each layer has its grain set at 90 degrees to its adjacent layers. This reduces the tendency of wood to split, and it increases its strength.

Ferrous Metal

- Contain Iron
- Magnetic
- Durable and Strong
- Relatively Inexpensive
- More Likely to Rust
- Silver

Nonferrous Metal

- Does not Contain Iron
- Non-magnetic
- Lighter and Malleable
- More Expensive
- High Corrosion Resistance
- Colorful

Common Alloys		
Name	Composition	Use
Bronze	Copper, tin	Jewelry, marine hardware
Brass	Copper, zinc	Hardware, musical instruments
Sterling silver	Silver, copper	Tableware
Pewter	Tin, copper, antimony	Tableware
Solder	Lead, tin	Plumbing
Wrought iron	Iron, carbon	Porch railings, fences, sculpture



29

Piercing saw – this has a fine blade and is used for cutting metals.



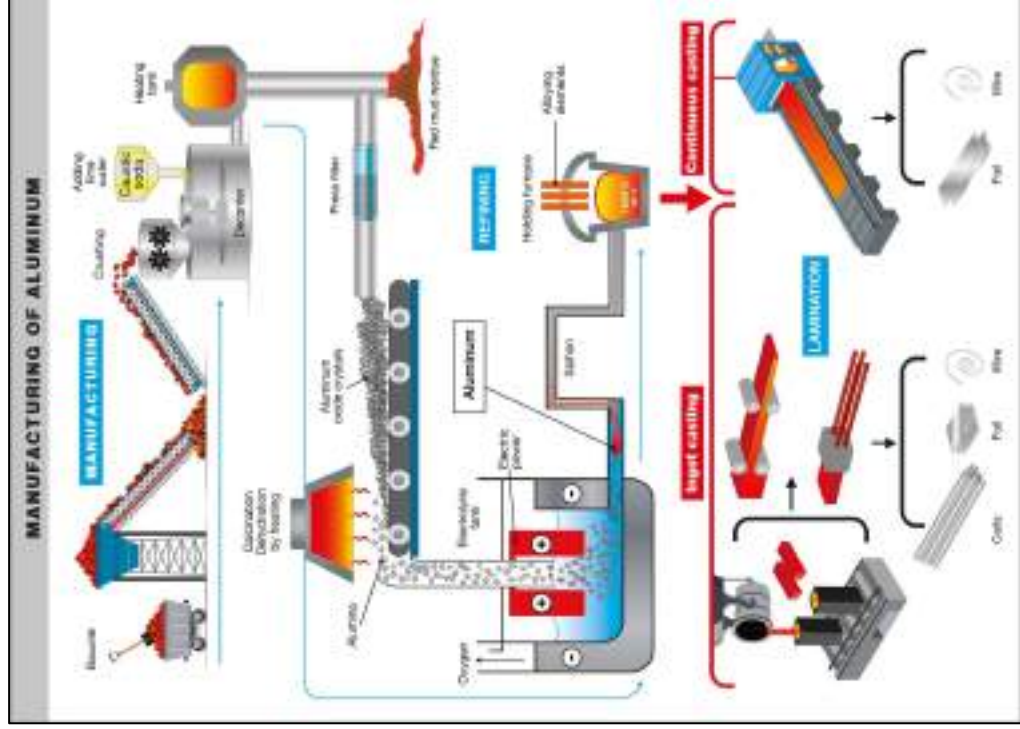
Metal files are used for removing sharp or uneven material around the edge of metals, to give it a good finish. Small files are called 'needle files' and are used in small scale work like jewellery.



Tin snips are used for cutting metals, to remove most of the waste material. They cannot be used for fine and detailed work (this is where you would use a piercing saw).



Annealing hearth and blow torch. These are needed to heat metal, to make it softer to beat / form and shape.



PROPERTIES OF METAL

- DUCTILE:** Represented by a coiled wire.
- HEAT CONDUCTIVE:** Represented by a hand holding a hot metal rod.
- ELECTRICALLY CONDUCTIVE:** Represented by a glowing lightbulb.
- MALLEABLE:** Represented by a hammer and anvil.
- LUSTER:** Represented by a stack of gold coins.
- STRONG:** Represented by a hammer and a metal rod.

THERMOPLASTICS

One type of plastic known for its versatility and recyclability

From where repeating units called monomers link into chains or branches

Strengths: Lightweight, Low processing costs

Low melting point: Weakens adhesive bonds

Commonly employed for manufacturing include PE, PVC and PS used for packaging applications. Other groups are acrylics, Acrylonitrile, polystyrene, polyethylene, and nylon.

Thermoplastics are considered to be a favorable candidate for cable piping

- Insulating electrical cable (Low-pressure PE)
- Pipes and belts (Polyethylene)
- Electrical equipment (High-pressure PE)

Classified according to the "Recycling Identification Code" (RIC) system

THERMOSETTING PLASTICS

A type of plastic which cannot be remelted or recycled due to its composite chemical structure

- Kevlar is a thermoset polymer consisting of cross-linked structure or heavily branched molecules.

Strengths: Heat resistance, Hard and rigid

The compounds used in thermosets are reactive systems

Low initial viscosity

Universal polyesters, Polyurethane, PU, Urea formaldehyde, UR

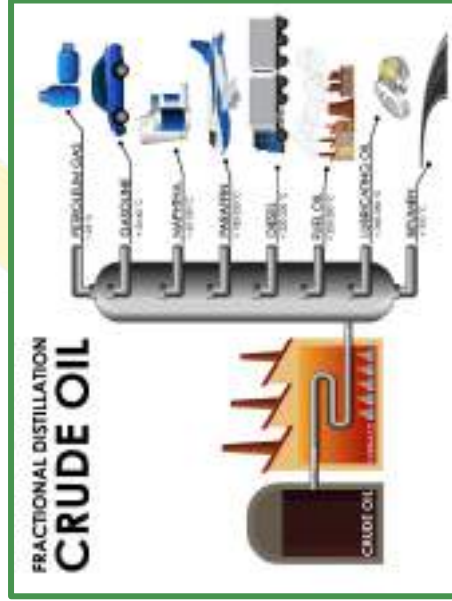
It can be used manufactured in a mold, while range of industries used and application for automotive, appliances, electrical, lighting, and energy materials

No "Recycling Identification"

Plastics are numbered as they have different qualities and so need to be separated before recycling.

1	2	3	4	5	6	7	OTHER
PETE	HDPE	PVC	LDPE	PP	PS	OTHER	OTHER
polyethylene terephthalate	high-density polyethylene	polyvinyl chloride	low-density polyethylene	polypropylene	polystyrene	polyurethane, isocyanate, etc.	polyurethane, isocyanate, etc.
soda bottles, fruit juice containers, cooking oil bottles, butter jars	milk jugs, laundry detergents, shampoo bottles	babble wrap, food trays, pipes, clear medical tubing	disposable shopping bags, many single-use plastics, most food wrappings	furniture, luggage, toys, car bumpers, interior and exterior car molding, plastic bottle caps	toys, plastic coffee lids, take-out food containers, Styrofoam, packing peanuts, egg cartons	car parts, nylon, baby bottles, CDs	car parts, nylon, baby bottles, CDs

Fractional distillation is the process used to separate products from crude oil, which, after cracking and polymerisation, produces polymers / plastics.



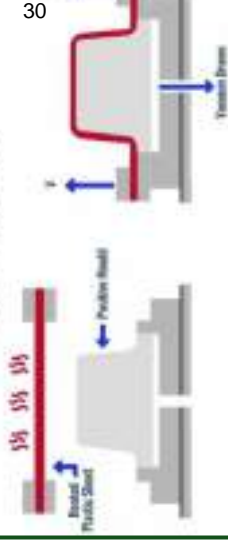
Contact adhesive is used to join plastics to other materials such as metals and timbers.



Tensol cement is used to join plastic to plastic.

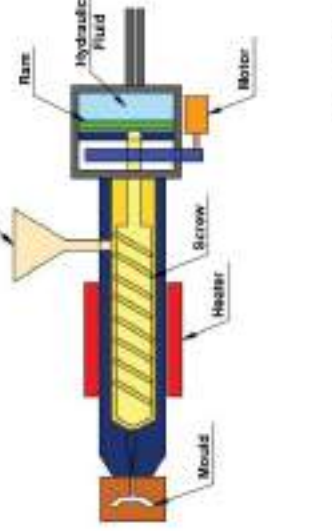


HOW IT WORKS

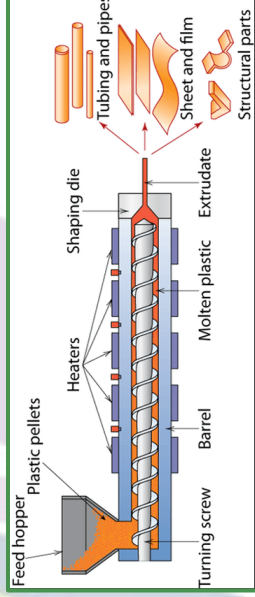


Vacuum forming over a mould to create a hollow casing. Used in packaging, hard suit cases as examples.

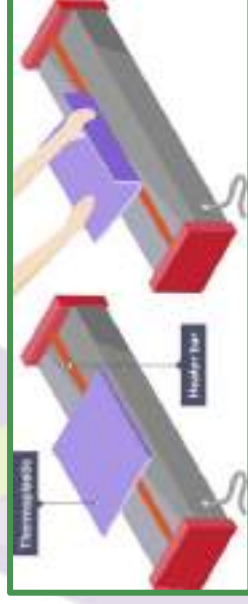
Injection Moulding



Injection moulding: common process for solid plastic objects with details. Examples are bottle tops, lego.



Plastics forced out of a nozzle to produce long, identical sections of materials.

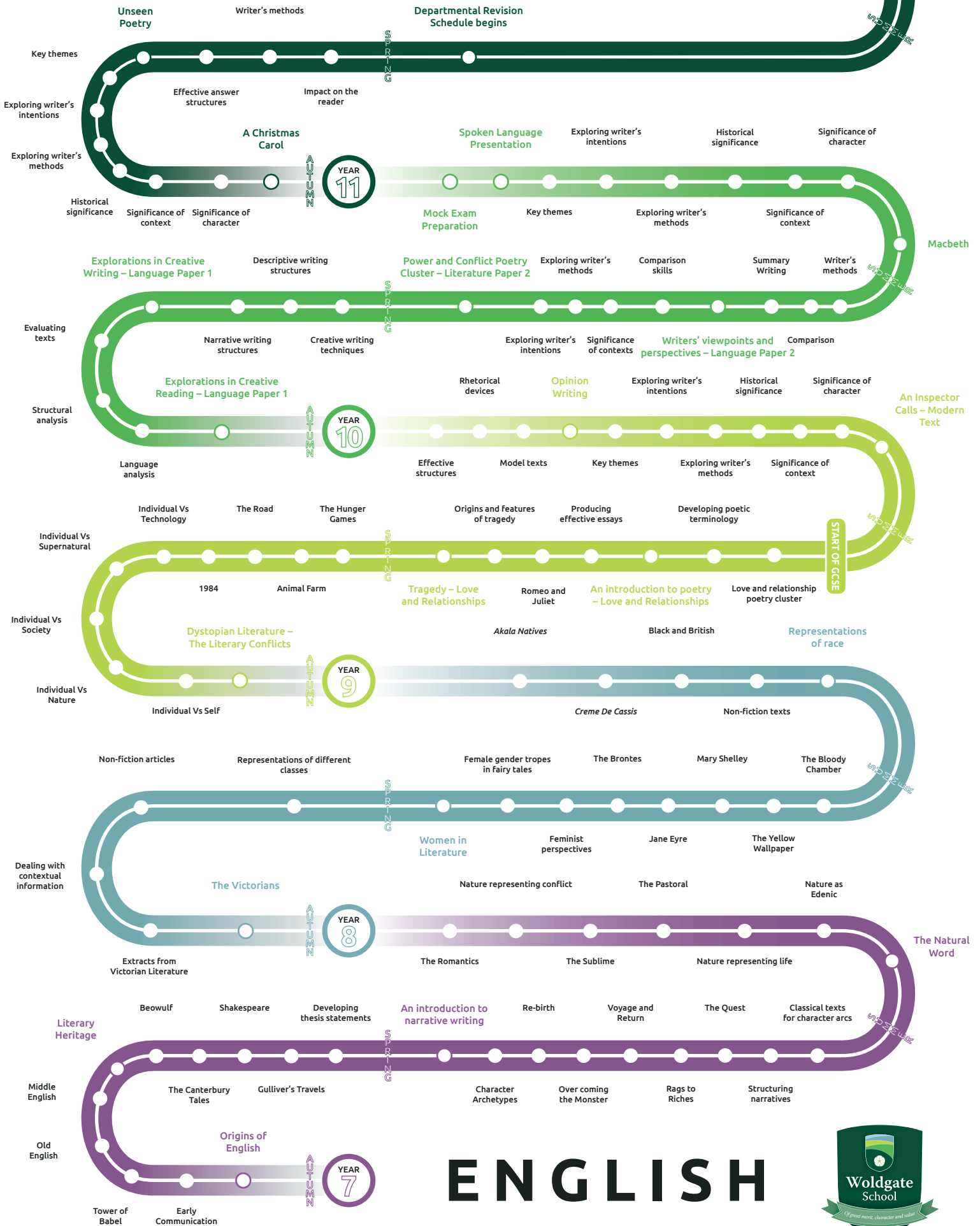


Line bending plastic – heating over a line of heat to achieve tight angles. Used in menu holders for example.



GCSE EXAMINATIONS

Two English Language Papers Two English Literature Papers



ENGLISH



POWER & CONFLICT POETRY

Poem	Content
Ozymandias Percy Shelley 1817	The poem is about the temporary nature of power. Ultimately, power will fade, art cannot immortalise power & nature will be long-lasting.
London William Blake 1794	Blake was influenced by the French Revolution & wanted social & political equality. He wanted the people to rise up against the powerful (church, monarchy) & in turn emancipate (liberate/free) themselves.
The Prelude: Stealing the boat William Wordsworth 1850	This is only an extract of the poem & is autobiographical . Although confident to begin with & enjoying the scenery, the narrator sees the mountain appear on the horizon & is overwhelmed with its sublime nature. It causes the narrator to retreat & change his view of nature, he now realises its power.
My Last Duchess Robert Browning 1842	A Duke is showing a visitor a portrait of his Duchess (former wife) who is now dead. The poem explores the unchecked power of the upper-classes. Poem based loosely on the real Duke of Ferrara.
The Charge of the Light Brigade Alfred Tennyson 1854	A tribute to the British cavalry (soldiers on horseback) who died during the Crimean War. The men were given an incorrect order to charge into battle & with swords, & meet the Russian enemy, who were armed with guns.
Exposure Wilfred Owen 1917-1978	An authentic poem based on Owens' own experience on the front line. It was a horrendous winter & the men are subject not to enemy attacks but to the brutality of nature.
Storm on the Island Seamus Heaney 1966	The narrator describes how a community are waiting to be hit by a storm. The narrator starts off confident but as the storm hits the power of the storm creates feelings fear & trepidation..
Bayonet Charge Ted Hughes 1957	The poem focuses on a single soldier's experience of a charge towards enemy lines, exploring his inner conflict. charge & could have been sleeping. The soldier fears for his life & the patriotic ideals that encouraged him to fight have gone.
Remains Simon Armitage 2008	A group of soldiers shoot a man who's running away from a bank raid. His death is described in graphic detail & the soldier who is telling the story can't get the death of the man out of his head.
Poppies Jane Weir 2009	A mother describes her son leaving home, seemingly to join the army. The poem is about the mother's emotional reaction losing her son to the war. She fears for his safety & after he leaves her she goes to a familiar place that reminds her of him.
War Photographer Carol Ann Duffy 1985	A war photographer is in his darkroom, developing pictures that he has taken in different warzones. As the pictures develop he recalls the death of one man & remembers the cries of his wife. The photographer contrasts his experiences to rural England & focuses on people who do not seem to care about war torn places.

Poem

Content

Tissue Imtiaz Dharker 2006	The poem uses tissue as an extended metaphor for life. She describes how life, like tissue is fragile. However, she also discusses some of the literal uses of paper that are intertwined with our lives, such as recording names in the Koran- She then goes onto to discuss how we are made from tissue (living tissue which is our skin) emphasising that life is fragile.
The Emigrée Carol Rumens 1993	The speaker speaks about a city that she left as a child. The speaker has a purely positive view of the city. The city she recalls has since changed, perhaps it was scene of conflict, however, she still protects the memory of her city. The city may not be a real place but represent a time, emotion -perhaps the speaker's childhood.
Kamikaze Beatrice Garland 2013	Kamikaze is the unofficial name given to Japanese pilots who were send on a suicide mission. The mission was considered one of honour but this poem is about a pilot who aborted the mission. Hi daughter imagines that her father was reminded of his childhood & the beauty of nature & life whilst on the mission. When he returned home he was shunned.
Checking Out Me History John Agard 2007	The narrator discusses his identity & emphasises how identity is closely linked to history & understanding your own history. In school he was taught British history & not about his Caribbean roots to which he feels resentful. He mocks some of the pointless things he was taught & contrasts the nonsense topics with admirable black figures.

Themes

Power of Nature: Ozymandias, The Prelude, Exposure, Storm on the Island, Tissue & Kamikaze.

Power of humans: Ozymandias, London, My Last Duchess, Tissue, Checking Out Me History.

Effects of conflict: The Charge of the Light Brigade, Exposure, Bayonet Charge, Remains, Poppies, War Photographer, Kamikaze.

Reality & brutality of conflict: The Charge of the Light Brigade, Exposure, Bayonet Charge, Remains, War Photographer.

Loss & Absence: London, Exposure, Poppies, The Emigree, Kamikaze.

Memory: The Prelude, My last Duchess, Remains, Poppies, War Photographer, The Emigree, Kamikaze.

Place: London, The Prelude, The Emigree, Kamikaze.

Identity: My Last Duchess, The Charge of the Light Brigade, Poppies, Tissue, The Emigree, Kamikaze, Checking Out Me History.

Individual Experiences: London, The Prelude, Bayonet Charge, Remains, Poppies, War Photographer, The Emigree, Kamikaze.

Bravery: Exposure, Bayonet Charge, The Charge of the Light Brigade.

English Language Paper 2

What method should I use?

<p>Question 1: 5 minutes</p> <p>Shade four true statements.</p>	<p>Question 2: 5 minutes (reading) + 10 minutes to answer</p> <p>Statement: Your point should state what you have learned from the source, using topic words from the question</p> <p>Quotation: choose a short quotation.</p> <p>Inference: explain what you learn from the whole quotation, using the sentence starters <i>This shows / suggests / implies...</i></p> <p>Comparative connective: <i>However, Similarly</i></p> <p style="text-align: center;">Do not analyse the quotation. This question tests AO1 (understanding the text), not AO2 (language / structural analysis).</p>	<p>Question 3: 5 minutes (reading) + 10 minutes to answer</p> <p>What: Your point should contain topic words from the question.</p> <p>How: choose a short quotation Choose one word and explain what it makes the reader think, feel or imagine.</p> <p>Why: explain how your chosen word links to the question and the extract using the sentence starter <i>Within the context of the extract...</i></p>	<p>Question 4: 5 minutes (reading) + 20 minutes to answer</p> <p>What: You should explain what the writer thinks / feels / imagines about the topic.</p> <p>How: choose a short quotation. Explain what you learn from the whole quotation, using the sentence starters <i>This shows / suggests / implies...</i> Then, explain what method the writer uses in the quotation.</p> <p>Why: Zoom in on a key word and explain what it makes the reader think / feel / imagine.</p> <p style="text-align: center;">Aim to write two comparisons.</p>	<p>Question 5: 5 minutes (planning) + 40 minutes to answer</p> <p>Use the structure:</p> <p>Because...</p> <p>But...</p> <p>So...</p> <p>Use discourse markers and link your ideas throughout.</p> <p>Tip: begin and end with an anecdote.</p>
---	---	---	--	---

Question 2: sentence starters

Source A focuses on TOPIC WORD as...

This can be seen in the quotation "_____".

This shows / suggests / implies...

However / Similarly,...

Source B focuses on TOPIC WORD as...

This can be seen in the quotation "_____".

This shows / suggests / implies...

Example

Source A focuses on the prison as a busy place.

This can be seen in the quotation "like a hive".

This suggests that the prisoners are like busy bees. This shows that the prison is almost like a colony with each prisoner having a role to play – cleaners, cooks, bakers.

However, source B makes the prison feel more threatening.

Question 3: sentence starters

The writer describes TOPIC WORD as...

This can be seen in the quotation "_____".

The word* "_____" in the quotation makes the reader think / feel / imagine...

Within the context of the extract, this word...

Example

The writer uses language to describe the boy's actions as evil.

The phrase "his wickedness" presents the boy's action this way as the abstract noun "wickedness" makes the reader imagine something immoral, while the pronoun "his" makes the reader think of ownership.

Within the context of the extract, the fact that the "wickedness" is linked to the boy by the pronoun "his" suggests that the boy has some ownership over his actions and is therefore evil.

This can be seen in the quotation that describes the prison as a “high fence topped with razor wire”.
 This suggests that the prison is an intimidating place.

Question 4: sentence starters

























The writer thinks / feels / imagines _____ about USE TOPIC WORDS.
 This can be seen in the quotation “_____”:
 This shows / suggests / implies...
 Within the quotation, the writer uses INSERT LANGUAGE / STRUCTURAL TECHNIQUE.
 This makes the reader think / feel / imagine...
 However / Similarly...

Example

In source A, the writer feels like the prisoners are treated as less than human.
 This can be seen in the quotation “humming like a hive”, which suggests that the prisoners are always extremely busy.
 The verb “humming” makes the reader imagine a rhythmic sound, which almost matches the rhythm of their labours.
 However, in source B, the writer thinks that prison is a threatening place.
 This can be seen through the description of the metal gates that “clang shut”.
 This suggests that prison is a place where prisoners have no control.
 The onomatopoeia “clang” is a jarring, harsh sound.
 This suggests to the reader that prison is an uncomfortable, clinical place.

Question 5

Because...	Imagine this situation: Just the other day, I was thinking...	
Appeal to pathos	Can you imagine... There are many reasons why this is an important issue. For example,... However, I think there is one key issue: This is the most important issue because...	
But...	Accept Although it is true that... Admittedly, ... While some people may think that... Unfortunately, it may be the case that... I acknowledge that... I can understand that... I appreciate that... It is unfortunately true that... I concede that...	Debunk However, ... Nevertheless, ... Even so, ... Whereas... Nonetheless, ... Despite... But... In fact, ... Conversely, ...
My argument	I think that... I strongly believe that... It is obvious that... It is clear that... My position is that... It is undeniable that... The fact is that... I ask to you to consider... In my opinion, ...	Developing your argument further Furthermore, ... In addition to... Moreover, ... Likewise, ... Again, ... Next, ... The most compelling reason is that... Without doubt, ...
So...	Appeal to ethos In summary, ... Finally, ... In conclusion, ... For these reasons, ... All in all, ... In short, ... Ultimately, ...	

Plot				
Act One	<ul style="list-style-type: none"> ✓ The Birling's are celebrating the upcoming marriage of Sheila Birling to Gerald Croft. ✓ An Inspector arrives claiming that a young woman called Eva Smith has just committed suicide. ✓ Eva was employed by Mr Birling and was fired unfairly. She was then taken on by a shop, Millwards where Sheila used her influence and got Eva fired too. ✓ Sheila feels terrible remorse. 			
Act Two	<ul style="list-style-type: none"> ✓ Gerald admits that he used Eva as a mistress and leaves upset. ✓ Mrs Birling was also involved by refusing to give Eva (now pregnant), any money when she came to beg for charity. Mrs Birling is adamant that the father of the child take responsibility. This turns out to be her son, Eric and she is seen as a hypocrite. 			
Act Three	<ul style="list-style-type: none"> ✓ Eric admits that he is the father of Eva's child. He feels terrible for what he has done. The Inspector leaves and they are all shocked. Gerald returns and informs the Birling's that there is no Inspector Goole working at the local police station. ✓ A phone call confirms this. However, the final lines in the play state that a girl has just died and they are all to be interviewed by an inspector. 			
Character summary		Killer quotations	Level 4+ ideas: linked themes / concepts	
Mr Arthur Birling	<ul style="list-style-type: none"> ▪ He represents middle class men who have made money via capitalism. ▪ He refuses to accept responsibility for anyone else except himself, including the death of Eva Smith. ▪ He represents capitalism and its ideals. ▪ He also represents an older generation that is less likely to be influenced by ideas of socialism. ▪ Despite his arrogance and confidence, Birling is no match for the wit, precision and intellect of The Inspector. 	<p>“If we were all responsible for everything that happened to everybody we'd had anything to do with, it would be very awkward, wouldn't it?” (Act 1)</p>	  	  
Mrs Sybil Birling	<ul style="list-style-type: none"> ▪ She represents many of the upper and middle class attitudes from the time: snobbishness and selfishness. ▪ She is part of the older generation that refuses to change or accept new ideas. She is happy to live in the status quo. ▪ She uses her influence to hurt other people rather than help them - it is difficult for the audience to do anything but dislike Mrs Birling. ▪ She seems to have some control over her husband, determining when he should or should not speak. Her role as matriarch in the family goes against the established patriarchal society of the Edwardian period. 	<p>“When you're married you'll realise that men with important work to do sometimes have to spend nearly all their time and energy on their business.” (Act 1)</p>	  	  
Sheila Birling	<ul style="list-style-type: none"> ▪ Sheila shows how gender roles are clearly defined at the start of the play: she is meant to be the sweet, innocent and naïve girl that gets married. ▪ As the play progresses, her character changes and she becomes far more determined, confrontational and aware. ▪ By the end of the play she represents a younger generation that is far more willing to take responsibility for the people around them. 	<p>“But these girls aren't cheap labour - they're people.” (Act 1)</p> <p>“And Eric's absolutely right... it makes me feel a bit less ashamed of us. You're just beginning to pretend all over again.” (Act 3)</p>	  	  
Eric Birling	<ul style="list-style-type: none"> ▪ Eric represents the younger generation that are more socially responsible than their parents. ▪ He drinks because he feels guilt about what he did: by violently forcing himself on Eva, he got her pregnant and helped to drive her towards suicide. ▪ Eric sometimes has contrary opinions to his parents and it is he who brings up the idea of war and suggesting his father could have paid Eva more money. ▪ Because he accepts responsibility by the end of the play, the audience come to respect Eric a lot more. 	<p>What about war?” (Act 1)</p> <p>“He could. He could have kept her on instead of throwing her out. I call it tough luck.” (Act 1)</p>	  	  

Gerald Croft	<ul style="list-style-type: none"> He represents the upper classes in the play. We, the audience, want him to change. However, he doesn't. He represents how the old class system is hard to remove - aristocrats don't want to lose their power and their status. 	<p>“Inspector: and you think young women ought to be protected against unpleasant and disturbing things? Gerald: if possible - yes.” (Act 2)</p>			
Inspector Goole	<ul style="list-style-type: none"> Despite questioning a family of wealthy members of the upper middle classes, the Inspector appears calm and assertive throughout. He seems to have already pre-planned exactly who is going to speak to and when and how he will speak to them. As Sheila comes to understand, the Inspector already knows how all the characters are connected to Eva. This gives him a ghost-like or supernatural quality. He seems to be operating on a different level of consciousness to the other characters and this has led to a number of theories about who or what Inspector Goole is. 	<p>“You see, we have to share something. If there's nothing else, we'll have to share our guilt.” (Act 2)</p> <p>“We don't live alone. We are members of one body. We are responsible for each other. And I tell you that the time will soon come when, if men will not learn that lesson, then they will be taught it in fire and blood and anguish. Good night.” (Act 3)</p>			
Edna	Edna's role in the play is seemingly insignificant, but she is the character that introduces the Inspector to the Birlings and she is the only genuine working-class presence in the whole play. Like Eva, Edna is ignored by the other characters for most of the play which is hugely symbolic in itself.				

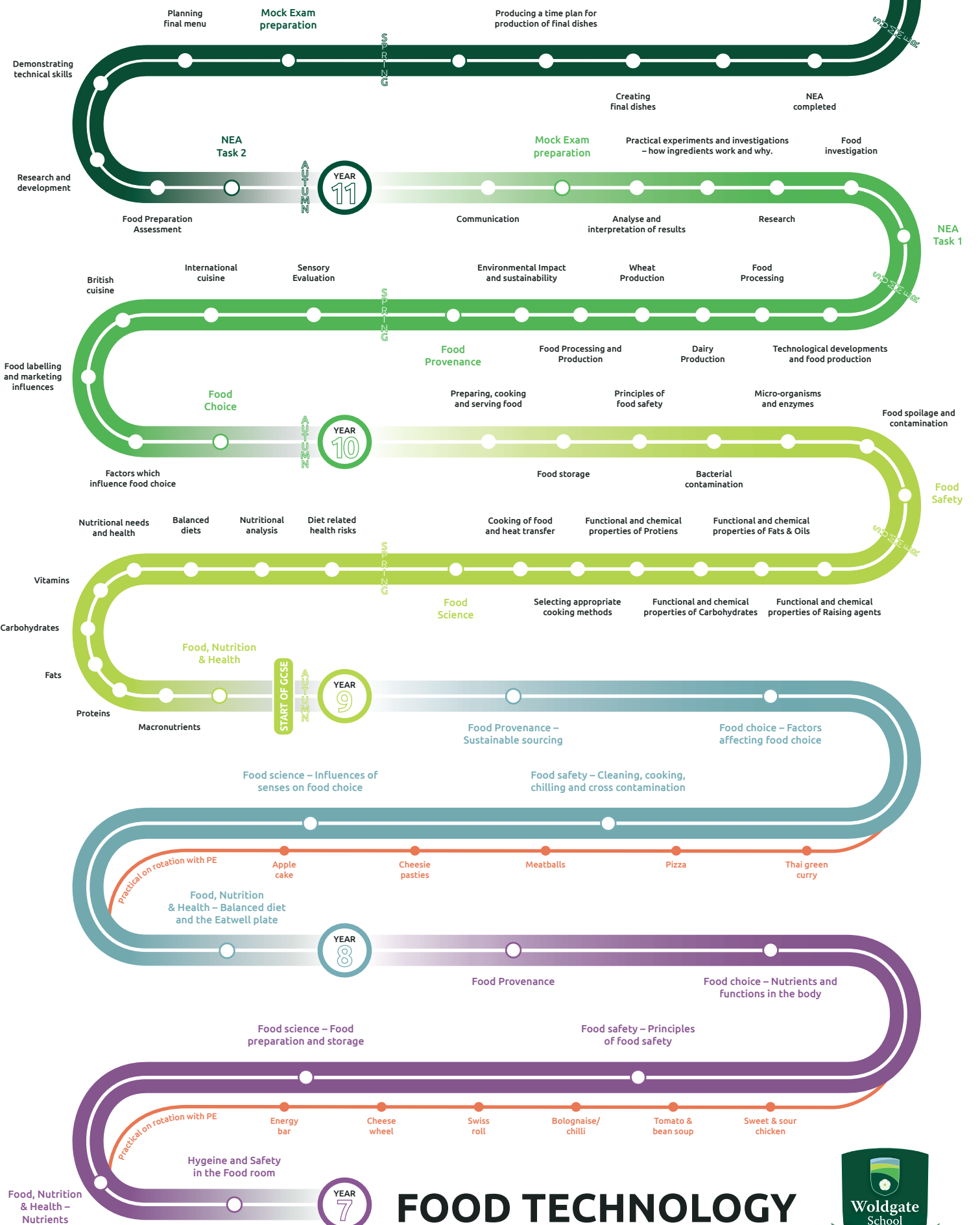
Context	Key terms	How to answer a character-based question
<p>In Literature, context means placing the text you are studying in the 'bigger picture'. You should ask yourself consider:</p> <ol style="list-style-type: none"> When the text was written What the society was like at the time the text was written What or who influenced the writer What political or social influences there would have been What influences there may have been in the genre that may have affected the writer When the text was written and when it was set may also have an important part to play in what is written The context hinted at by the examination question 	<p>Archetype (n.) / archetypal (adj.): a very typical example of a certain person or thing.</p> <p>Cyclical structure: a piece of prose or poetry that begins and ends in a similar way.</p> <p>Dramatic irony: a literary technique, originally used in Greek tragedy, where the audience or reader knows something that the characters do not.</p> <p>Exposition: the part of a story that sets the stage for the drama to follow: it introduces the theme, setting and characters.</p> <p>Foreshadowing: an indication of a future event.</p> <p>Ideology: a system of ideas, especially ones that form the basis of economic or political theory.</p> <p>Playwright: a person who writes plays.</p> <p>Raisonneur: a character in a text who voices the central theme or point of view of the work.</p> <p>Subservient: considered less important, or subservient.</p>	<ol style="list-style-type: none"> Introduction: answer the question and explain your premise How the character is established How the character begins to develop How the character continues to develop How the character ends the play Conclusion: how context or other factors support your premise.
<p>Edwardian Period: The play is set in 1912 during the Edwardian period. This is the time between the end of the Victorian era and the start of the First World War in 1914. In this time period class divisions were still very clear with there being virtually no welfare state or benefits in place for the poorer sections of society.</p>		<p style="text-align: center;">Introduction and premise</p> <p>Sentence 1: Define the key word in the question. Personalise it - what does it mean to you? Contextualise it based on the text you're writing about.</p> <p>Sentence 2: Identify a question based on what the author wants us to think of the key theme/character named in the exam question.</p>
<p>The Post-War Period: The play was performed in 1945 (in the Soviet Union and in the UK in 1946). This was a time of significant social, economic and political upheaval after two World Wars that completely altered the make-up of British society.</p>		<p>Model: "How does Priestley present the theme of equality in the play?"</p> <p>Sentence 1: An equal society is one in which there are no disparities between people due to gender, class, wealth or age.</p> <p>Sentence 2: In <i>An Inspector Calls</i>, Priestley's horrifying microcosm of a society ruled by greed encourages us to question the lack of equality in an unjust Edwardian England.</p>
<p>Capitalism: An economic and political system in trade and industry are controlled by private owners for profit, not the state.</p>	<p>Socialism: A political philosophy that and theory that believes the means of production, distribution, and exchange should be owned or regulated by the community.</p>	
<p>The Titanic: A colossal passenger ship that sank on its maiden voyage from Britain to America in 1912.</p>		



GCSE EXAMINATIONS

1x GCSE Examination Paper

Revision of Key Topics



FOOD TECHNOLOGY



Job Roles⁴⁹

Front of House

- Head waiter
- Waiting Staff
- Sommelier
- Maître d'hôte
- Concierge
- Receptionist
- Porter
- Chauffeur





Housekeeping

- Chambermaid
- Cleaner
- Maintenance
- Caretaker

Management

- Hotel
- Food & Beverage
- Restaurant
- Housekeeping
- Marketing

Types of Provision

 Commercial	 Non-Commercial
 Residential	 Non-Residential

Types of Service

Food

- Table:**
- Plate
 - Silver
 - Banquet
 - Family-style
 - Gueridon

Counter:

- Cafeteria
- Fast Food
- Buffet

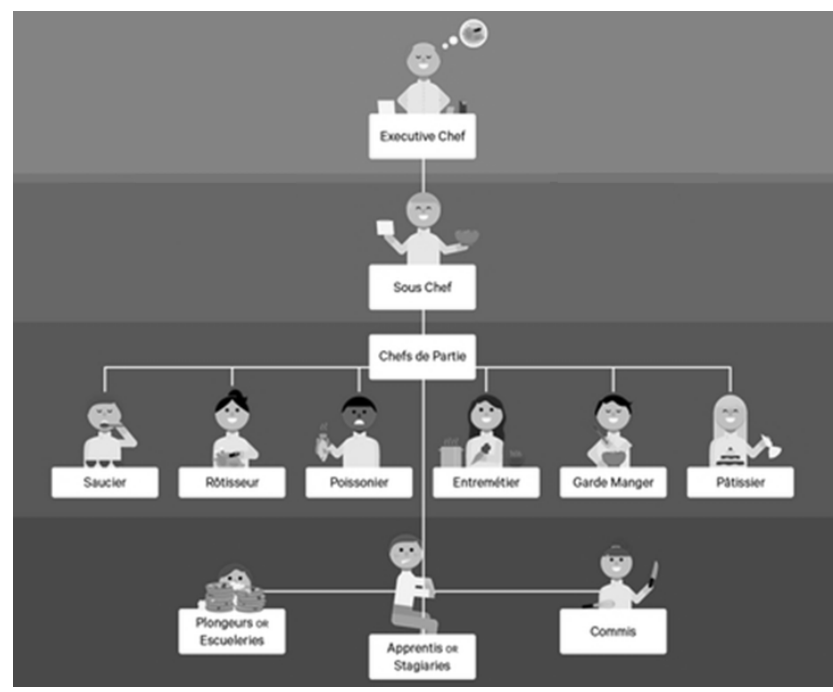
Personal:

- Tray or Trolley
- Home delivery
- Takeaway

Residential

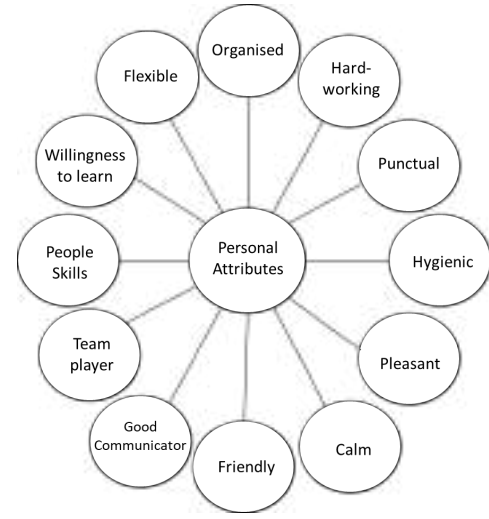
- **Rooms:** single/double/suite/family
- **Hygiene facilities:** en-suite/shared
- **Refreshments:** breakfast/lunch/evening meal; restaurant; room service
- **Leisure:** spa/gym/pool
- **Conference/function facilities**

Kitchen Brigade



Qualifications

- KS4**
- Level 1/2 vocational award
- Post-16**
- Certificate in H&C
 - Certificate in culinary skills
 - Diploma in professional cookery
 - Diploma in H&C
- University**
- BSc/BA degree



Ratings



Contracts

- Full-time:** set days/times set - entitled to holiday/sick pay
- Part-time:** same as FT but fewer hours
- Casual:** usually agency – not entitled to holiday/sick pay
- Seasonal:** usually Christmas/Summer to suit business need for specific time frame
- Zero-hour:** no hours or days stated – not entitled to holiday/sick pay

Remuneration

- Salary
- Holiday pay
- Pension
- Sick pay
- Tips
- Bonus



Front of House

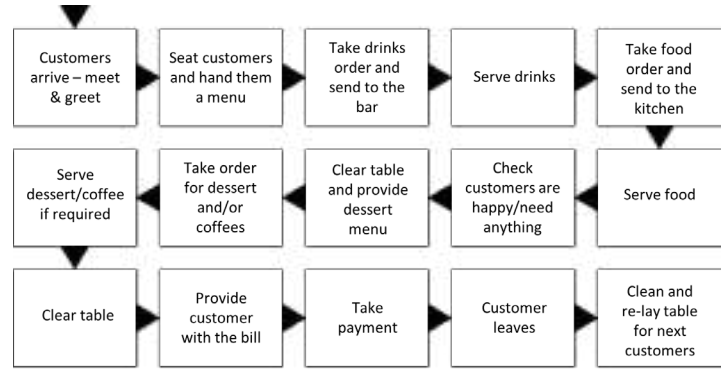
Dress Code



Areas

- Reception
- Lounge/waiting area
- Seating/dining area
- Counter
- Bar
- Equipment stations
- Toilets/Cloakroom
- Stairs/Lifts
- Safety Equipment

Workflow



Back of House

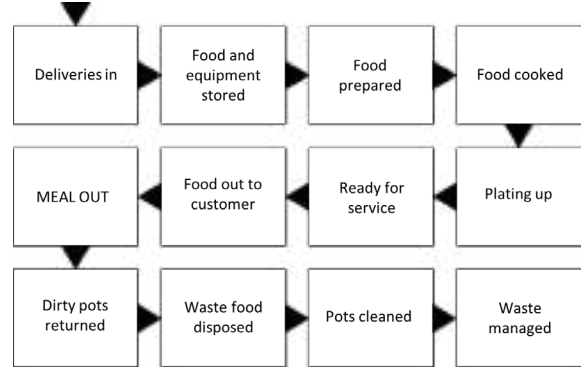
Dress Code



Areas

- Delivery
- Storage
- Staffing
- Preparation
- Cooking
- Serving
- Cleaning
- Waste

Workflow



Documentation

- Accident forms
- Risk Assessments



FACTORS



Media

Printed:

- Posters
- Flyers
- Magazines/newspapers
- Business cards

Broadcast:

- TV
- Radio

Internet:

- Social media
- Websites
- Blogs
- Podcasts
- Email



EQUIPMENT

Large
Storage: walk-in fridge, blast chiller
Preparation: standing floor mixer
Cook: Deep-fat fryer, griddle
Clean: pass-through dishwasher; glass washer

Mechanical
Preparation: blender, weighing scales
Cook: temperature probe
Specialist: pizza oven, coffee machine

Small
Preparation: mixing bowls, chopping boards
Cook: pans, tongs
 baking dish/tray
Serving: plates, glassware

Safety
Cleaning: detergents, cloths, waste bags
Preparation: date labels, foil
Safety: fire extinguisher, first aid box, oven gloves

TASK 3 NEA HELP SHEET

Hands:

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

Clothing and hair:

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

Cuts:

- Cover with a blue, waterproof plaster.

Equipment:

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

Food safety and hygiene practices

Ingredients:

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

Cleaning:

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

Temperatures:

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

Waste management:

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

Practical skills & techniques

Basic preparation skills and techniques

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

Medium preparation skills and techniques

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

Complex preparation skills and techniques

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

Presentation techniques

Creativity

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

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

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

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

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

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

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

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

Accompaniments

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

Carbohydrate accompaniments:

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

Fruit and vegetable accompaniments:

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

Sauces:

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

Portion control

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

Garnish

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

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

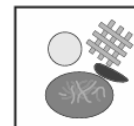
Sweet: chocolate dipped strawberries, tuile biscuits, chopped nuts, tempered chocolate work, spun sugar work, edible flowers.

Decoration

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

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

Plating styles



Classic



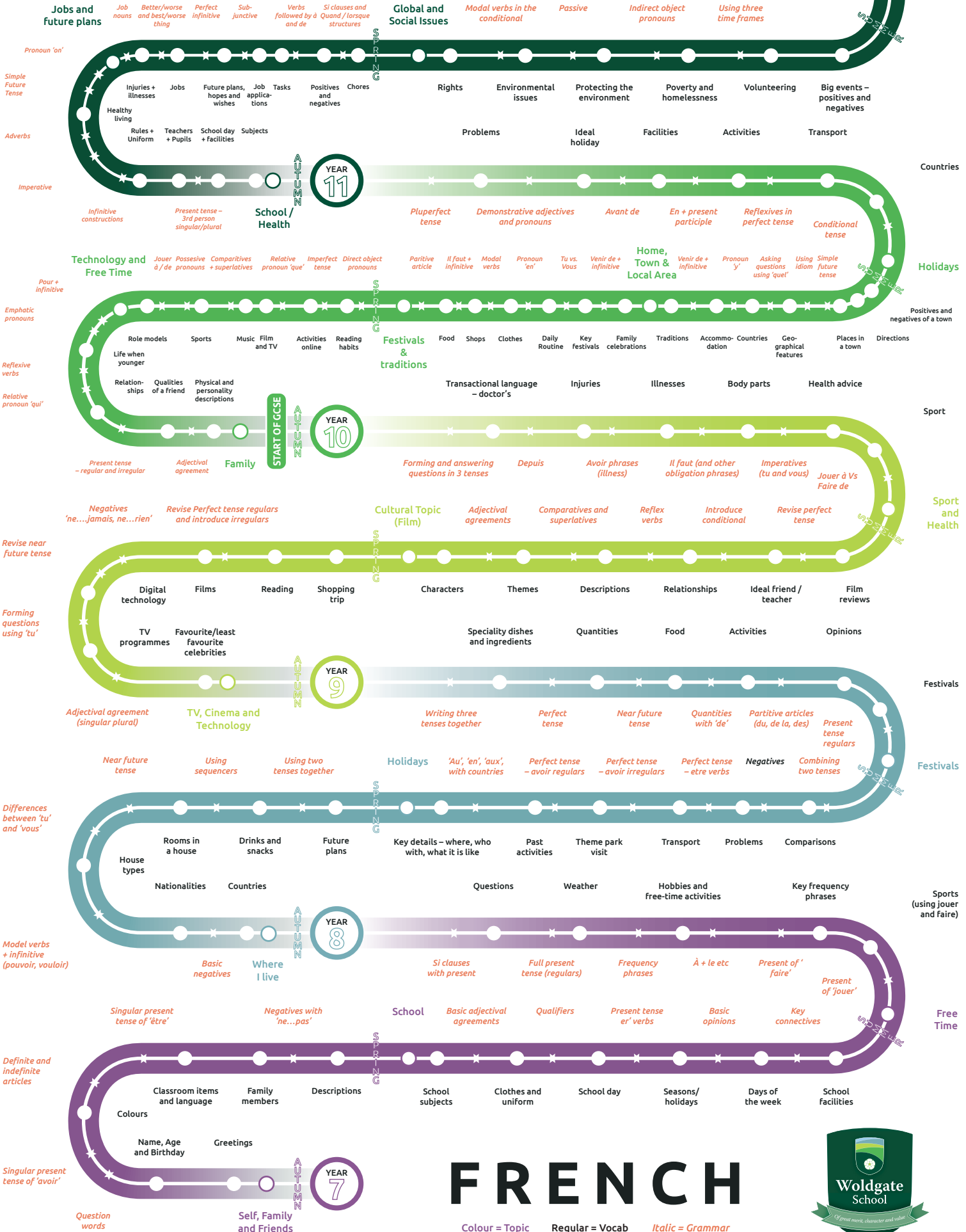
Freeform



Landscape

GCSE EXAMINATIONS

Reading (25%)
Listening (25%)
Writing (25%)
Speaking (25%)



FRENCH

Colour = Topic Regular = Vocab *Italic = Grammar*





Sain ou mal sain

Saying 'some': 'DE'

Ce plat contient	du	chocolat / fromage / riz	Masculine de + (le) Feminine de + (la) Plural de + (les)
Ce dessert contient	de la	poulet / poisson / sucre.	
Ces gâteaux	des	glace / sauce / viande.	
contiennent		frites / fruits / légumes.	

Which foods do you like and don't like?

	
C'est sain.	C'est malsain.
C'est bon pour la santé.	C'est mauvais pour la santé.
Le plat a bon goût. C'est délicieux!	Je n'aime pas le goût.
C'est parfait pour les végétariens.	Ce n'est pas bon pour les végétariens.

It's healthy	It's unhealthy
It's good for your health	It's bad for your health
The dish (food) tastes good	I don't like the taste
It's perfect for vegetarians	It's not good for vegetarians

Note these two meanings of the word *moins*:
moins de (+ noun) less, fewer
au moins at least

To give instructions, you can also use *il faut* (it is necessary to / you must) + infinitive.

The **vous**-form imperative is used to give advice or instructions when you are talking to more than one person or to one person that you don't know well. It is the present tense of the verb without the word **vous**.

vous allez (you go) → **Allez!** (Go!)

vous mangez (you eat) → **Mangez!** (Eat!)

<p>J'ai l'impression que (I have the impression that)</p> <p>Je crois que (I believe that)</p> <p>Je pense que (I think that)</p>	<p>J'ai un régime sain (I have a healthy diet)</p> <p>Je suis en forme (I am in shape)</p> <p>Je suis un régime équilibré (I follow a balanced diet)</p>	<p>je bois beaucoup d'eau (I drink lots of water)</p> <p>je dors huit heures par nuit (I sleep eight hours per night)</p> <p>je fais de l'exercice régulièrement (I do exercise regularly)</p>
<p>D'habitude (Usually)</p> <p>En général (In general)</p>	<p>Pour avoir de l'énergie (To have energy)</p> <p>Pour être en bonne santé (To be in a good health)</p> <p>Pour rester en forme (To stay in shape)</p>	<p>beaucoup de fruits et légumes (lots of fruit and veg)</p> <p>de la nourriture biologique (organic food)</p>
<p>Pour améliorer ma santé (To improve my health)</p> <p>Pour être en meilleur forme (To be in a better shape)</p>	<p>Il est important de... (It's important to)</p> <p>il faut (It's necessary to)</p> <p>J'essaie de... (I / I try to)</p>	<p>boire beaucoup d'eau (to drink lots of water)</p> <p>dormir huit heures par nuit (to sleep eight hours per night)</p> <p>faire de l'exercice régulièrement (to do exercise regularly)</p>
<p>À l'avenir, (Going forward)</p> <p>Dans le futur, (In the future)</p>	<p>Je dois (I must)</p> <p>je devrais (I should)</p> <p>J'essaie de... (I / I try to)</p> <p>J'ai l'intention de... (I / I intend to)</p> <p>Je vais faire un effort pour (I'm going to make an effort to)</p>	<p>manger (to eat)</p> <p>arrêter de (to stop)</p> <p>éviter de (to avoid)</p>

Sain ou malsain? (pages 82–83)

Ce plat / Ce dessert contient ..	This dish / This dessert contains ..
Ces gâteaux contiennent ..	These cakes contain ..
du chocolat / fromage / riz	chocolate / cheese / rice
poisson / *poulet / sucre	fish / chicken / sugar
de la glace / *sauce / viande	ice cream / sauce / meat
des frites / fruits / légumes	chips / fruit / vegetables
À ton avis, le plat , c'est sain?	In your opinion, is the dish healthy?
C'est sain / malsain.	It is healthy / unhealthy.
C'est bon / mauvais pour la santé	It is good / bad for your health.
Le plat a bon goût.	The dish tastes good.
Je n'aime pas le goût.	I don't like the taste.
C'est parfait pour (les végétariens)	It's perfect for vegetarians.
Ce n'est pas bon pour les végétariens. It's not good for vegans.	

le goût

délicieux

végan/végane

végétarien/végétarienne

Allez plus souvent au centre sportif!

Faites de la natation une fois *par semaine!

Mangez moins de frites et de chocolat!

Dormez au moins huit heures *par nuit!

Essayez de faire plus d'exercice!

Allez au collège à pied ou à vélo!

the taste

délicious

vegan

vegetarian

Go to the sports centre more often!

Go swimming once a week!

Eat fewer chips and less chocolate!

Sleep at least eight hours per night!

Try to do more exercise!

Go to school on foot or by bike!

1. Bon appétit

Meals and mealtimes

G

In French, the partitive article ('some') agrees with the noun it refers to:

masculine singular	feminine singular	before a vowel sound	plural
du sucre	de la viande	de l' eau	des légumes

After a negative or a quantity, just use **de** (**d'** before a vowel):
Je ne mange pas de viande. Je bois beaucoup d'eau.

Page 94

G

The pronoun **en** can be used to replace *du/de la/de l'/des + noun*. It means 'it'/'of it' or 'them'/'of them'. It goes in front of the verb.

Je mange des légumes. J'en mange beaucoup.
 I eat vegetables. I eat lots of them.

Je bois du café, mais je n'en bois pas trop.
 I drink coffee, but I don't drink too much of it.

Page 94

D

These two sounds are nasal sounds. Say them at the back of your throat, as though you have a cold!

There are four different ways of spelling each sound:

- *en, an, em, am* • *ain, in, aim, im*

Listen and repeat the tongue-twister.
Le matin, quand j'ai le temps, je mange du pain dans ma chambre.

G

You use the perfect tense to say what you did, e.g.
j'ai goûté (I tasted) *j'ai servi* (I served)
j'ai fait (I made) *je suis allé(e)* (I went)

How many perfect tense verbs can you spot in exercise 6?

Page 96

★

Look out for small words that can change the meaning of a sentence.

<i>sans</i>	without
<i>au lieu de</i>	instead of
<i>sauf</i>	except

Qu'est-ce que tu manges, normalement?

What do you usually eat?

Qu'est-ce que tu <i>What do you</i>	prends <i>have</i> manges <i>eat</i> bois <i>drink</i>	pour le petit-déjeuner? <i>for breakfast?</i>	pour le déjeuner? <i>for lunch?</i>	pour le snack? <i>as a snack?</i>	pour le dîner? <i>for dinner?</i>
		à midi? <i>at lunchtime?</i>	après les cours? <i>after school?</i>	le soir? <i>in the evening?</i>	
Est-ce que tu <i>Do you</i>		quelque chose <i>something</i>			

Qu'est-ce que tu manges?

What do you eat?

Pour le petit-déjeuner, <i>For breakfast,</i>	je mange <i>I eat</i>	souvent <i>often</i>	du <i>some</i>	pain. <i>bread.</i> poulet. <i>chicken.</i> poisson. <i>fish.</i> bœuf. <i>beef.</i>
		parfois <i>sometimes</i>	de la <i>some</i>	glace. <i>ice cream.</i> viande. <i>meat.</i>
	je prends <i>I have</i>	tout le temps <i>all the time</i>	des <i>some</i>	fruits. <i>fruit.</i> légumes. <i>vegetables.</i> œufs. <i>eggs.</i> pâtes. <i>pasta.</i>
		de temps en temps <i>from time to time</i>	du <i>some</i>	café. <i>coffee.</i> lait. <i>milk.</i> thé (à la menthe). <i>(mint) tea.</i>
Le soir, <i>In the evening,</i>	je prends <i>I have</i>	seulement <i>only</i>	de l' <i>some</i>	eau. <i>water.</i>

Qu'est-ce que tu manges?

What do you eat?

Quand <i>When</i>	j'ai <i>I am</i>	soif, <i>thirsty,</i>	je bois <i>I drink</i>	du thé. <i>tea.</i> un verre de lait. <i>a glass of milk.</i>
		faim, <i>hungry,</i>	je mange <i>I eat</i>	un sandwich. <i>a sandwich.</i> un fruit. <i>a piece of fruit.</i>
J'en mange <i>I eat it</i>	beaucoup <i>a lot</i>	parce que <i>because</i>	parce que <i>because</i>	c'est délicieux. <i>it's delicious.</i> c'est sain. <i>it's healthy.</i> c'est bon pour la santé. <i>it's good for your health.</i>
J'en bois <i>I drink it</i>	souvent <i>often</i>	car <i>because</i>	cela contient trop de sucre. <i>it contains too much sugar.</i>	
Je n'en mange pas <i>I don't eat it</i>	parce que <i>because</i>	car <i>because</i>	parce que je suis végétarien/végétarienne/végan/végane. <i>because I am (a) vegetarian/vegan.</i>	
Toute ma famille mange <i>All my family eat</i>	de la viande <i>meat</i> du poisson <i>fish</i>	sauf <i>except</i>	ma mère. <i>my mother.</i> mon frère. <i>my brother.</i>	

Qu'est-ce que tu as fait?

What did you do?

	je suis allé(e) / I went on est allé(e)s / we went	au marché. / to the market. au supermarché. / to the supermarket.
	j'ai acheté / I bought	du fromage. / cheese. des légumes. / vegetables.
Hier, / Yesterday,	j'ai préparé / I prepared	un tagine. / a tagine. un plat. / a dish.
	j'ai servi / I served	
	j'ai ajouté / I added	des olives. / olives.

Bon appétit! (pages 84–85)

Qu'est-ce que tu manges (normalement)?
What do you (usually) eat?

Qu'est-ce que tu prends pour le petit-déjeuner?
What do you have for breakfast?

Qu'est-ce que tu manges et bois à midi?
What do you eat and drink at lunchtime?

Est-ce que tu manges quelque chose après les cours?
Do you eat something after school?

Normalement, le soir, qu'est-ce que tu manges?
What do you usually eat in the evening?

Pour le petit-déjeuner / À midi:
After school
Normalement, le soir, ...
Usually, in the evening, ...
je bois / je mange / je prends ...
I drink / I eat / I have ...
du café / pain / *poulet
coffee / bread / chicken
du poisson / *vin rouge
fish / red wine

du lait / *thé (à la *menthe)
du *boeuf / lait de *coco
de la glace
des fruits / légumes / œufs
des *olives / pâtes
de l'eau
un sandwich / un verre de lait
Je mange souvent des œufs.
Quand j'ai soif, je bois du thé.
Hier, j'ai acheté du fromage au marché.
J'en mange beaucoup, parce que c'est délicieux.
Toute ma famille mange de la viande, **sauf** ma mère.

milk / (mint) tea
beef / coconut milk
ice cream
fruit / vegetables / eggs
olives / pasta
water
a sandwich / a glass of milk
I often eat eggs
When I am thirsty, I drink tea
Yesterday, I bought cheese at the market
delicious
All my family eat meat, except my mother.

2. Bien dans ma peau

You use the tu-form imperative to give advice or instructions to someone you know well.

The tu-form works like this:

tu écoutes (you listen) → **Écoute!** (Listen!)

tu vas (you go) → **Val!** (Go!)

Note that you drop the final 's' from the verb.

Être is irregular.

tu es patient (you are patient) → **Sois patient!** (Be patient!)

In the negative, ne/n' ... pas goes around the verb:

Ne pleure pas. (Don't cry.)

G

The modal verbs **devoir** (to have to, must), **pouvoir** (to be able to, can) and **vouloir** (to want (to)) are usually followed by an infinitive.

Tu **dois** parler avec quelqu'un. You must talk to someone.
Je **veux** faire une fête. I want to have a party.

Negatives go around the modal verb:
Il **ne peut pas** parler avec son prof. He can't talk to his teacher.

Page 95

The closed sound **-eu** is the sound in the number **deux**.

Listen and repeat the phrases:

Je **peux** être **heureux**.

Si tu **veux**, on **peut** jouer à des **jeux**.

Il **veut** montrer qu'il **peut** être **sérieux**.

Comment tu te sens aujourd'hui?

How do you feel today?

Comment tu te sens *How do you feel*

Comment ça va *How are you*

Qu'est-ce qui ne va pas *What's wrong*

Quel est le problème *What's the problem*

aujourd'hui? *today?*

Comment tu te sens aujourd'hui?

How do you feel today?

Ça va *I am*

Ça ne va pas *I am not*

très *very*

vraiment *really*

un peu *a bit*

assez *quite*

très *very*

vraiment *really*

assez *quite*

très *very* vraiment

really

bien. *well/good.*

triste. *sad.*

en colère. *angry.*

fatigué/fatiguée. *tired.*

inquiet/inquiète. *worried.*

stressé/stressée. *stressed.*

mal. *bad.*

heureux/heureuse. *happy.*

calme. *calm.*

Qu'est-ce que je peux faire?

What can I do?

Écoute Tu peux écouter Tu dois écouter	<i>Listen</i> <i>You can listen</i> <i>You must listen</i>	un peu de musique. <i>to some music.</i>
Fais Tu peux faire Tu dois faire	<i>Do</i> <i>You can do</i> <i>You must do</i>	du théâtre. <i>some drama.</i> de la cuisine. <i>some cooking.</i> une activité physique. <i>a physical activity.</i>
Fais Tu peux faire Tu dois faire	<i>Go</i> <i>You can go</i> <i>You must go</i>	une petite promenade. <i>for a walk.</i>
Va Tu peux aller Tu dois aller	<i>Go</i> <i>You can go</i> <i>You must go</i>	au lit. <i>to bed.</i> à un cours de yoga. <i>to a yoga class.</i>

Qu'est-ce que je dois faire?

What must I do?

Parle Tu peux parler Tu dois parler	<i>Talk</i> <i>You can talk</i> <i>You must talk</i>	avec moi. <i>to me.</i> de tes problèmes. <i>about your problems.</i>
Tu dois expliquer le problème à Essaye d'en parler avec	<i>You have to explain the problem to</i> <i>Try to speak about it with</i>	tes profs / tes parents. <i>your teachers / your parents.</i> lui/elle/quelqu'un. <i>him/her/someone.</i>
Sois Tu dois être	<i>Be</i> <i>You must be</i>	calme. <i>calm.</i> patient/patiente. <i>patient.</i>
Ne sois pas Tu ne dois pas être	<i>Don't be</i> <i>You mustn't be</i>	triste. <i>sad.</i> inquiet/inquiète. <i>worried.</i>
Ne N'	<i>Don't</i>	crie pas. <i>shout.</i> pleure pas. <i>cry.</i> t'inquiète pas. <i>worry.</i> oublie pas <i>forget</i>
		tes devoirs. <i>your homework.</i>

Bien dans ma peau (pages 86-87)

Comment tu te sens (aujourd'hui)?	How do you feel today?	Écoute un peu de musique. Fais de la cuisine. Parle avec moi. Sois calme / patient. Va au lit / à un cours de *yoga. Va faire une petite *promenade. Ne crie / pleure / t'inquiète pas. N'oublie pas tes devoirs. Ne sois pas triste. Tu dois parler avec quelqu'un. Tu dois expliquer le problème à ...	Listen to some music. Do some cooking. Speak to me. Be calm / patient. Go to bed / to a yoga class. Go for a walk. Don't shout / cry / worry. Don't forget your homework. Don't be sad. You must speak to someone. You have to explain the problem to ...
Comment ça va aujourd'hui? Ça va très bien. Ça ne va pas bien.	How are you today? I am very well. I am not well/not good.	Essaye d'en parler avec ... Cherche en ligne. Tu dois éviter de passer trop de temps devant des écrans . Ils peuvent te conseiller	Try to speak about it with ... Search online. You have to avoid spending too much time in front of screens. They can advise you
Qu'est-ce qui ne va pas? Quel est le problème? Je me sens ... Je suis ... un peu / assez / très / vraiment ... a bit / quite / very / really ...	What's wrong? What's the problem? I feel ... I am ...		
calme / en colère *fatigué(e) heureux/heureuse inquiet/inquiète triste stressé(e)	calm / angry tired happy worried sad stressed		

3. Ça ne va pas?

Illness & Accidents



To say that something hurts or is sore, use *avoir mal* à + noun.
 à + **le = au** à + **les = aux**

masculine noun	feminine noun	plural noun
J'ai mal au dos. I have a sore back.	J'ai mal à la tête. I have a headache.	J'ai mal aux yeux. I have sore eyes.

Note: *le cœur* means 'heart', but *avoir mal au cœur* means 'to feel sick'.

These expressions use *avoir* (to have), rather than *être* (to be) in French:

avoir chaud to be hot
 avoir froid to be cold
 avoir faim to be hungry
 avoir soif to be thirsty
 avoir peur to be afraid

Avoir - to have

J'ai	I have
Tu as	You have
Il a	He / it has
Elle a	She / it has
Nous avons	We have
Vous avez	You have (plural)
Ils ont	They have (M)
Elles ont	They have (F)

Remind yourself how to form the imperative, using the grammar boxes on pages 83 and 86, then read the examples below.

tu-form	vous-form
Reste au lit.	Restez au lit.
Va à l'hôpital.	Allez à l'hôpital.
Sois patient(e).	Soyez patient(e).
Ne bouge pas.	Ne bougez pas.
	Stay in bed.
	Go to the hospital.
	Be patient.
	Don't move.

Reflexive verbs (e.g. **se** blesser) take **être** in the perfect tense:

Je me suis blessé(e). I injured myself.

The past participle must **agree** with the subject:

Elle s'est brûlée. She burnt herself.

But if you add a body part, there is no agreement:

Elle s'est cassé la jambe. She broke her leg.

Où as-tu mal?

Where does it hurt?

J'ai mal

My ... hurt(s) / I have (a) sore

J'ai vraiment mal

My ... really hurt(s) / I have (a) really sore

	au	nez. nose. ventre. stomach. bras. arm. pied. foot. dos. back.
	à la	tête. head. gorge. throat. jambe. leg. main. hand. bouche. mouth.
	à l'	oreille. ear.
	aux	yeux. eyes. oreilles. ears.
J'ai mal au cœur. I feel sick.		

Quel est le problème?

What's the problem?

J'ai / <i>I am</i>	chaud. <i>hot.</i> froid. <i>cold.</i> faim. <i>hungry.</i> soif. <i>thirsty.</i> peur. <i>afraid.</i>
J'ai / <i>I have</i>	de la fièvre. <i>a temperature.</i>
Je suis / <i>I am</i>	malade. <i>ill.</i> fatigué(e). <i>tired.</i>
C'est / <i>It is</i> Ce n'est pas / <i>It is not</i>	grave. <i>serious.</i>
Je ne peux pas / <i>I can't</i>	aller au collège. <i>go to school.</i> faire mes devoirs. <i>do my homework.</i>

Quel est le problème?

What's the problem?

J'ai eu / <i>I had</i>	un accident. <i>an accident.</i>
Je me suis /	blessé(e)/brûlé(e). <i>injured/burned myself.</i>
Ça s'est passé / <i>It happened</i>	ce matin. <i>this morning.</i> hier. <i>yesterday.</i>
Je me suis cassé / <i>I broke my</i> Je me suis blessé / <i>I injured my</i>	le bras. <i>arm.</i> la jambe. <i>leg.</i> les mains. <i>hands.</i>
Je me suis coupé(e) / <i>I cut my</i>	au doigt. <i>finger.</i> à la jambe. <i>leg.</i> aux mains. <i>hands.</i>
Je suis allé(e) / <i>I went</i>	à l'hôpital. <i>to the hospital.</i>
J'ai pris / <i>I took</i>	des médicaments. <i>some medication.</i>
Je me sens / Ça va / <i>I feel / It is</i>	mieux maintenant. <i>better now.</i>

Ça ne va pas? (pages 88-89)

le corps. **humain**

le bras / le cœur / le dos
le nez / le pied / le ventre
la bouche / la gorge / la jambe
la main / l'oreille / la tête
les yeux

Allô? Je peux vous aider?

Bonjour. Je voudrais prendre rendez-vous, s'il vous plaît.

Bien sûr. Quel est le problème?

J'ai très / vraiment mal au bras et mal à la main / tête.

J'ai mal à l'oreille et j'ai de la fièvre aussi.

Vous voulez un rendez-vous pour quand?

the human body

arm / heart / back
nose / foot / stomach
mouth / throat / leg
hand / ear / head
eyes

Hello? Can I help you?

Hello. I would like to make an appointment, please.

Of course. What is the problem?

I have a very / really sore arm and a sore hand / headache

I have an earache and I also have a fever

When would you like an appointment?

Demain après-midi. / Aujourd'hui. Tomorrow afternoon. / Today.

Mercrredi, s'il vous plaît. Wednesday, please.

Pas de problème. No problem.

Le rendez-vous est à quelle heure, s'il vous plaît? What time is the appointment, please?

C'est à deux / trois / dix heures. It is at two / three / ten o'clock.

C'est à deux / trois / dix heures trente / et demie. It is at half past two / three / ten.

Quelle est l'adresse, s'il vous plaît? What is the address, please?

C'est dans la rue (du Marché), au numéro. It is in (Market) Street, at number

dix / quinze / vingt-cinq. ten / fifteen / twenty-five.

Merci. Au revoir. Thank you. Goodbye.

J'ai eu un accident. I had an accident.

Je me suis cassé le/la ... I broke my ...

Ça s'est passé ... It happened ...

4. Je change ma vie

Improving your life:

63

G You use the simple future tense to say someone 'will' do something.

To form the simple future of regular -er verbs, take the infinitive (e.g. *travailler*) and add these endings:

je travailler ai	I will work
tu travailler as	you will work
il/elle/on travail lera	he/she/we will work
nous travail l er ons	we will work
vous travail l er ez	you will work
ils/elles travail l er ont	they will work

The following verbs are irregular:

aller (to go) → *j'irai* (I will go)

avoir (to have) → *j'aurai* (I will have)

être (to be) → *je serai* (I will be)

faire (to do/make) → *je ferai* (I will do/make)

Page 97

- Use plus to say 'more' (or 'more' + adjective/adverb).
J'aiderai plus. (I will help more.)
Je serai plus calme. (I will be calmer.)
- Use plus de/d' to say 'more' + noun.
Je mangerai plus de fruits. (I will eat more fruit.)
Je ferai plus d'exercice. (I will do more exercise.)

G To create more complex sentences, use the following expressions, followed by the infinitive:

pour (+ infinitive) in order to ...

afin de (+ infinitive) in order to ...

au lieu de (+ infinitive) instead of ...

avant de (+ infinitive) before ...

Pour être en forme, je ferai plus d'exercice.

Afin de mieux dormir, je ne regarderai pas mon portable.

Au lieu de manger du chocolat, je mangerai des fruits.

Avant d'aller au lit, je n'irai pas sur les réseaux sociaux.

À l'avenir, qu'est-ce que tu feras pour améliorer ta vie? <i>In the future, what will you do to improve your life?</i>			
Je passerai <i>I will spend</i>	moins de temps <i>less time</i>	sur les réseaux sociaux. <i>on social media.</i>	
Je jouerai <i>I will play</i>	au tennis. <i>tennis.</i> de la guitare. <i>the guitar.</i>		
Je ferai <i>I will do/make</i>	plus <i>more</i>	d'exercice. <i>exercise.</i> de vélo. <i>cycling.</i> d'efforts en maths. <i>effort in maths.</i>	
J'irai <i>I will go</i>	à des cours de danse <i>to dance classes</i> à des cours de cuisine <i>to cooking classes</i> à la piscine <i>to the swimming pool</i> au centre sportif <i>to the sports centre</i>	au moins deux fois par semaine. <i>at least twice a week.</i> au moins dix fois par mois. <i>at least ten times a month.</i>	
Je serai <i>I will be</i>	plus	actif/active. <i>more active.</i>	
		gentil/gentille <i>kinder</i> sympa <i>nicer</i>	avec <i>to/with</i>
J'aurai <i>I will have</i>	plus de patience <i>more patience</i>	mon demi-frère. <i>my half-brother.</i> ma petite sœur. <i>my little sister.</i>	
une meilleure attitude à la maison. <i>a better attitude at home.</i>			

À l'avenir, qu'est-ce que tu feras pour améliorer ta vie? <i>In the future, what will you do to improve your life?</i>			
Je mangerai <i>I will eat</i>	mieux. <i>better.</i>	plus de légumes. <i>more vegetables.</i> plus de fruits. <i>more fruit.</i>	
J'achèterai <i>I will buy</i>	moins de choses sucrées. <i>fewer sweet things.</i> moins de chocolat. <i>less chocolate.</i>		
Je penserai <i>I will think</i>	moins <i>less</i>	à moi. <i>about myself.</i>	
J'aiderai <i>I will help</i>	les autres. <i>others.</i> ma mère. <i>my mother.</i> mes grands-parents. <i>my grandparents.</i>		
Je travaillerai <i>I will work</i>	plus sérieusement au collège. <i>harder at school.</i>		
J'écouterai <i>I will listen to</i>	le/la prof quand il/elle parle. <i>the teacher when he/she speaks.</i>		
Je ne parlerai pas <i>I will not speak</i>	en même temps que le/la prof. <i>at the same time as the teacher.</i>		
Je ne ferai pas <i>I will not do</i>	mes devoirs à la dernière minute. <i>my homework at the last minute.</i>		

À l'avenir, qu'est-ce que tu feras pour améliorer ta vie? <i>In the future, what will you do to improve your life?</i>			
Pour <i>In order to</i>	être <i>be</i> me sentir <i>feel</i>	plus en forme, <i>in better shape,</i>	je ferai <i>I will go</i>
		moins fatigué(e), <i>less tired,</i>	du vélo. <i>cycling.</i> une longue promenade. <i>for a long walk.</i>
Afin de/d' <i>In order to</i>	réduire le stress, <i>reduce stress,</i> améliorer ma santé, <i>improve my health,</i>	J'irai au lit plus tôt. <i>I will go to bed earlier.</i>	
		Je serai plus actif/active. <i>I will be more active.</i> J'irai à des cours de cuisine. <i>I will go to cooking classes.</i>	

Au lieu de/d' <i>Instead of</i>	choisir <i>choosing</i> écrire des e-mails, <i>writing emails,</i> aller au lit, <i>going to bed,</i> dormir, <i>sleeping,</i>	des frites, <i>chips,</i> des choses sucrées, <i>sweet things,</i>	j'achèterai des légumes. <i>I will buy vegetables.</i> je préparerai des plats végétariens. <i>I will prepare vegetarian dishes.</i> je ferai la liste des pays que je veux visiter un jour. <i>I will make a list of countries I want to visit one day.</i>
Avant de/d' <i>Before</i>			je ne regarderai pas mes messages. <i>I will not look at my messages.</i>

Je change ma vie (pages 90–91)
 À l'avenir, qu'est-ce que tu feras, pour améliorer ta vie?

J'achèterai – mes grands-parents	I will buy – I will help others / my mother and my grandparents	Je passerai moins de temps sur les réseaux sociaux.	I will spend less time on social media.
J'aurai – plus de *patience avec ma petite sœur.	I will have – more patience with my little sister.	Je penserai moins à moi.	I will think less about myself.
une meilleure attitude à la maison.	a better attitude at home.	Je serai plus actif/active.	I will be more active.
J'écouterai la prof quand elle parle.	I will listen to the teacher when she is speaking.	Je serai plus gentil(la) / sympa avec ma petite sœur / mon demi-frère.	I will be kinder / nicer to my little sister / my half-brother.
Je ferai plus d'exercice / de vélo.	I will do more exercise / cycling.	Je travaillerai plus sérieusement au collège.	I will work harder at school.
Je ferai plus d'efforts en maths.	I will make more effort in maths.	Je ne ferai pas mes devoirs à la dernière minute!	I will not do my homework at the last minute!
J'irai (plus souvent) au centre sportif / à des cours de cuisine / à des cours de danse.	I will go (more often) to the sports centre / to cookery classes / to dance classes.	Je ne parlerai pas en même temps que la prof.	I will not speak at the same time as the teacher.
J'irai à la piscine au moins deux fois *par semaine.	I will go to the swimming pool at least twice a week.	Pour / Afin de/d' – être plus en forme / moins *fatigué.	In order to ... be in better shape / less tired.
Je jouerai au tennis.	I will play tennis.	réduire le *stress.	reduce stress. ...
Je mangerai mieux.	I will eat better.	Au lieu de/d' – choisir des frites / écrire des e-mails.	instead of ... choosing chips / writing emails ...
Je mangerai – moins de choses sucrées / chocolat.	I will eat – fewer sweet things / less chocolate.	Avant d'aller au lit, ...	Before going to bed, ...
plus de fruits / légumes.	more fruit / vegetables.		

6. Mieux vivre

Lifestyle changes

G

There are two parts to most negatives in French:

ne ... pas not
 ne ... rien nothing
 ne ... jamais never
 ne ... plus no more / no longer

Like other negatives, ne ... plus goes around the verb:

Je ne suis plus seul(e). I am no longer alone.

G

You use:

- the imperfect tense to say what you used to do
je travaillais (I used to work)
- the present tense to say what you do now
je travaille (I work)
- the future tense to say what you will do
je travaillerai (I will work)

Watch out for these irregular verbs:

	imperfect	present	future
avoir (to have)	j'avais (I used to have)	j'ai (I have)	j'aurai (I will have)
être (to be)	j'étais (I used to be)	je suis (I am)	je serai (I will be)
faire (to do/make)	je faisais (I used to do)	je fais (I do)	je ferai (I will do)

Page 97

Sometimes, time phrases give you clues about timeframes:

quand j'étais jeune ... (when I was young ...)
maintenant ... (now ...)
à l'avenir ... (in the future ...)

Listen carefully to the verb endings to help you decide which tense is being used:

j'habitais (I used to live)
j'habite (I live)
j'habiterai (I will live)

Quand tu étais plus jeune, ta vie était comment?

When you were younger, how was your life?

Je suis né(e) <i>I was born</i>	au <i>in</i> en <i>in</i>	Sénégal. <i>Senegal.</i> Côte d'Ivoire. <i>Côte d'Ivoire.</i> France. <i>France.</i>	dans la banlieue de Paris. <i>in the suburbs of Paris.</i> dans un petit village. <i>in a small village.</i>
Quand j'étais <i>When I was</i>	petit/petite, <i>little,</i> plus jeune, <i>younger,</i> ado, <i>a teenager,</i>	je travaillais <i>I worked</i> je jouais <i>I played</i> j'étais <i>I was</i> je n'étais pas <i>I wasn't</i>	dans un hôtel. <i>in a hotel</i> au tennis. <i>tennis.</i> au basket. <i>basketball.</i> heureux/heureuse. <i>happy.</i> en colère. <i>angry.</i> timide. <i>shy.</i>

Maintenant, est-ce que ta vie est meilleure?

Now, is your life better?

Maintenant, je suis <i>Now, I am</i>	politicien/politicienne. <i>a politician.</i> acteur/actrice. <i>an actor/actress.</i>	
Je ne suis plus <i>I am no longer</i>	seul/seule. <i>alone.</i> triste. <i>sad.</i>	
Je n'ai plus <i>I am no longer</i>	peur. <i>scared.</i>	
Je me sens <i>I feel</i>	fort/forte. <i>strong.</i> optimiste. <i>optimistic.</i> heureux/heureuse. <i>happy.</i>	
J'écris <i>I write</i>	des chansons. <i>songs.</i> des poèmes. <i>poems.</i>	
Je lutte <i>I fight</i>	pour <i>for</i>	les droits des travailleurs. <i>the rights of workers.</i>
	contre <i>against</i>	l'inégalité. <i>inequality.</i>

67

Maintenant, est-ce que ta vie est meilleure?

Now, is your life better?

Maintenant, je suis <i>Now, I am</i>	politicien/politicienne. <i>a politician.</i> acteur/actrice. <i>an actor/actress.</i>	
Je ne suis plus <i>I am no longer</i>	seul/seule. <i>alone.</i> triste. <i>sad.</i>	
Je n'ai plus <i>I am no longer</i>	peur. <i>scared.</i>	
Je me sens <i>I feel</i>	fort/forte. <i>strong.</i> optimiste. <i>optimistic.</i> heureux/heureuse. <i>happy.</i>	
J'écris <i>I write</i>	des chansons. <i>songs.</i> des poèmes. <i>poems.</i>	
Je lutte <i>I fight</i>	pour <i>for</i>	les droits des travailleurs. <i>the rights of workers.</i>
	contre <i>against</i>	l'inégalité. <i>inequality.</i>

Qu'est-ce que tu feras à l'avenir?

What will you do in the future?

À l'avenir, <i>In the future,</i>	je continuerai à lutter pour <i>I will continue to fight for</i>	la justice. <i>justice.</i>
	je travaillerai pour <i>I will work for</i>	l'égalité. <i>equality.</i>
	je chanterai. <i>I will sing.</i>	
	je jouerai dans des films. <i>I will act in films.</i>	
	je serai politicien/politicienne. <i>I will be a politician.</i>	
j'aiderai <i>I will help</i>	d'autres jeunes. <i>other young people.</i> les autres. <i>others.</i>	

Mieux vivre (pages 92-93)

Quand tu étais plus jeune,
ta vie était comment?
Je suis né(e) en *Côte
d'Ivoire / France.
Ma famille était *modeste.
Quand j'étais jeune, ...
j'habitais ...
Je jouais au tennis / au basket.
Je travaillais dans un hôtel.
Maintenant, est-ce que ta
vie est meilleure?
Maintenant, ...
Je suis *politicien(ne).
Je suis acteur/actrice.

When you were younger,
how was your life?
I was born in Ivory
Coast / France.
My family was modest.
When I was young, ...
I lived ...
I played tennis / basketball
I worked in a hotel.
Now, is your life better?
Now, ...
I am a politician.
I am an actor.

j'écris des chansons / des
*poèmes.
Je lutte pour les droits des
travailleurs.

I write songs / poems.
I fight for the rights of
workers.

Qu'est-ce que tu **feras** à
l'avenir?
À l'avenir ...
Je **continuerai** à lutter pour la
justice et l'égalité.
Je **chanterai**.
Je **jouerai** dans des films.

What will you do in the
future?
In the future, ...
I will continue to fight for
justice and equality.
I will sing.
I will act in films.

Grammaire

The modal verbs *pouvoir*, *vouloir* and *devoir* are usually followed by an infinitive.

pouvoir (to be able, can)

Je peux
tu peux
il/elle/on peut
nous pouvons
vous pouvez
ils/elles peuvent

vouloir (to want (to))

Je veux
tu veux
il/elle/on veut
nous voulons
vous voulez
ils/elles veulent

devoir (to have to, must)

Je dois
tu dois
il/elle/on doit
nous devons
vous devez
ils/elles doivent

- Reflexive verbs take être (not avoir) in the perfect tense
- The past participle of être verbs must agree with the subject.
- The reflexive pronouns *te* and *se* shorten to *t'* and *s'* in front of a vowel



se reposer (to rest)		
Je me suis reposé(e)	I rested	
Tu t'es reposé(e)	you rested	
Il/elle/on s'est reposé(e)(s)	he/she/we rested	
Nous nous sommes reposé(e)s	we rested	
Vous vous êtes reposé(e)(s)	you rested	
Ils/elles se sont reposé(e)s	they rested	



Remember!

rester = to stay, se reposer = to rest

Challenge checklist

	<ul style="list-style-type: none"> ✓ Past, present and future timeframes ✓ Connectives / time phrases / sequencers ✓ Some extended sentences ✓ Different opinion phrases
	<ul style="list-style-type: none"> ✓ A wider range of tenses (e.g. imperfect, future) ✓ Different persons of the verb ✓ Phrases with avoir (e.g. j'ai mal ...) ✓ A wide range of interesting vocabulary
	<ul style="list-style-type: none"> ✓ Phrases with more than one tense ✓ Modal verbs (e.g. je peux / je dois / on doit) + infinitive ✓ Complex language (e.g. pour + infinitive, afin de + inf, au lieu de + inf, reflexive verbs) ✓ Pronouns ✓ More varied connectives (au lieu de ...)

GCSE EXAMINATIONS



Revision

UK in the 21st century

Physical Geography of the UK

London's booming population

The UK's global role and our influence in conflicts, media and food

Resources & shortages

Food, Water and Energy security

Food security

Development case study

Human Geography of the UK

The UK's ageing population

The UK's changing economy and post-industrial UK

Resource reliance

Farming & fishing for food

Theories on the future

Fieldwork

Barriers to development

Dynamic development

Cities case study

Urban population explosion and growth of slums

Super-sized cities in an urban world

Human impacts on the TRF

Polar environments

Characteristics and value of a tropical rainforest

Distributions of biomes & their climate, flora and fauna

Uneven development

YEAR 11

The global development divide and measuring development

Defining development

Urban trends in the UK

How cities began and grew

Urban futures

Characteristics of polar regions

Human Impacts on a tropical rainforest

Ecosystems and interdependence

Contrasting case studies of natural weather

Plate boundaries and tectonic cases studies

Distinctive Landscapes

The physical and human landscape of the UK

Coastal erosional and depositional landforms

Rivers

Fieldwork

Sustaining ecosystems

Tropical storms, drought & El Nino

Structure of the Earth

Mitigation of tectonic hazards

What makes a distinctive landscape

Geomorphic processes

River landforms

Coasts case study

Extreme weather conditions

Global hazards

UK impacts of climate change

Greenhouse effect

Natural causes of climate change

Patterns of climate change

Changing Climates

Global circulation system and climate zones

START OF GCSE

YEAR 10

Global impacts of climate change

Human causes of climate change

Evidence of climate change

UK's place in the wider world

Globalisation

Clone Towns

Russia – What are the opportunities and challenges facing Russia?

Biomes

Human Issues

Middle East – Why is the Middle East an important region?

Biomes

Human Issues

Transition to GCSE

Going global

BREXIT

Loss of Culture

Location

Skills

Physical Issues

Location

Skills

Physical Issues

Evidence of glaciation in the Lake district

Physical Issues

Skills

Location

Flood hazards and management

Fluvial process including weathering

Changing glaciers

Movement

Glacier formation

YEAR 9

Human Issues

Biomes

Asia – What are the opportunities and challenges facing Asia?

River features and landforms

Hydrology – Why are rivers important?

Tectonic Hazards – Why do people remain at risk?

Plate margins & movement

Earthquake processes

Rocks

Biosphere

Natural resources for energy

Changing Economies – How have shifting economies impacted cities across the globe?

Sectors of industry

Industrialisation of NEEs

Addressing inequality

Earth structure

Volcano processes

Tsunami

Resource risk – Are we running out of natural resources?

Soils

Hydrosphere

Sustainability

Urban problems

Deindustrialisation

Sustainable development

Earth structure

Volcano processes

Tsunami

Resource risk – Are we running out of natural resources?

Soils

Hydrosphere

Sustainability

Urban problems

Deindustrialisation

Poverty

Measuring development

Distribution of Wealth

Development – Why are some places more developed than others?

YEAR 8

Human Issues

Biomes

Africa – What are the opportunities and challenges facing Africa?

Migration

Population distribution and settlement factors

Change over time

Measuring development

Distribution of Wealth

Development – Why are some places more developed than others?

YEAR 8

Physical Issues

Skills

Location

Urbanisation

Population change

Difference between weather and climate

Extreme weather

Beast from the East

Coasts – Should we defend our coastlines?

Landforms

Coastal case study

Rainforests

Tourism

Population – Can we solve the problem of overpopulation?

Weird Weather – Is Weather becoming more extreme?

Coastal processes

Coastal management

Economy Vs Environment – Are we risking our natural world in order to make money?

Antarctica

Hydrocarbons

Map skills

How do Geographers think?

YEAR 7

Locational knowledge

What is a geographer?

GEOGRAPHY



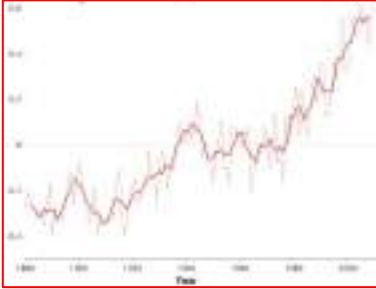
What is Climate Change?

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

Quaternary geological period

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

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

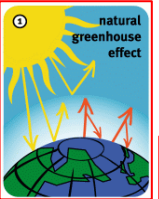


Natural Greenhouse Effect

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

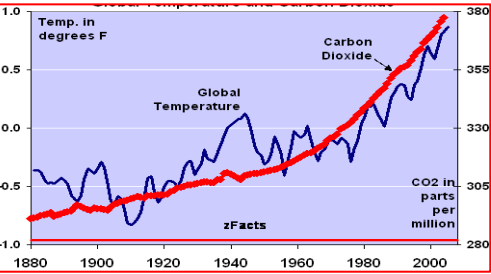
Enhanced Greenhouse Effect

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



Linking CO₂ and Global temperatures

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



Evidence for climate change

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

Sea Ice Patterns	Sea ice forms around the poles in winter when ocean temperatures fall below -1.8 degrees. By observing the patterns of ice, the data is very reliable but doesn't go far back.
Global Weather Data	Since the 1850s, global temperatures have been measured accurately using thermometers. This gives a reliable record but doesn't go very far back.
Ice Cores	Ice cores are made up from different layers that each represents a different historical time. By exploring the water molecules of these cores, scientists have calculated fluctuating temperatures of the atmosphere. 400,000 year old ice cores can exist.
Diaries and paintings	Historical records from ancient cave paintings, diaries and written observations have provided evidence of climate change through personal accounts from the people through them.

Retreat of the Columbia Glacier, Alaska, USA

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



Greenhouse Gases

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

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

Topic 2 CHANGING CLIMATE

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

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

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

Recent Evidence for climate change.

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

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

Evidence of natural change

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

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


Whose responsible?

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

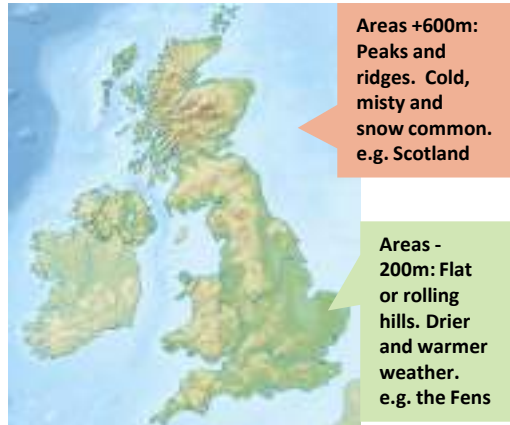


Not what it seems

Although China is responsible for the highest amount of carbon emission, 1.4 billion people do live there. However, per person, the USA (320 million) actually contributes far more CO₂ emissions.

Global impacts of climate change		Rising Sea Levels: The Maldives			Climate change management: Paris Agreement 2015		
The impact of rising temperatures is affecting the world socially, economically and environmentally in several potential problematic ways.		The Maldives is a group of almost 1200 tiny islands in the Indian Ocean. 200 islands are inhabited, most expected to be flooded by 2100. Most islands are low-lying with the highest natural island being 2.5m above sea level. 80% of land is less than 1metre above sea level. Population is 540,000 people and the economy relies mainly on tourism and fishing.			Paris climate conference involved 195 countries making a legally binding global climate deal. This agreement objective is to limit global warming to below 2°C. The aims of this objective are... <ul style="list-style-type: none"> Limit emissions to pre-industrial levels. Meet every 5 years to set new targets. Communicate plans to the public. Provide support to developing countries at reducing emissions. 		
Extreme Weather	Climate is causing more unpredictable and severe weather events. This includes more frequent and powerful tropical storms; more extreme heatwaves and lasting droughts. E.g. Typhoon Haiyan 2013	Impacts from climate change			Extreme Weather: Big Dry Australia 2002-9		
Rising sea levels	Sea levels have risen by 20 cm since 1901. due to thermal expansion, melting glaciers and ice caps. Some coastal countries are now disappearing such as the Maldives in the Indian Ocean.	Social	Economic	Environmental	Australia is part of the driest inhabited continent and has lived with drought throughout its history. From 2002 to 2009 it experienced the driest period in 125 years, which became known as the 'Big Dry'. In 2006, the annual rainfall was 40-60 per cent below normal over most of Australia south of the tropic of Capricorn.		
Food supply	Warmer temperatures and changing rainfall will make it harder to produce a reliable source of food to sustain a rising global population. E.g. In 2011, Russia banned crop exports after a decline in yield.	- Water supply due to droughts becoming more common. - Wells are becoming polluted by seawater. - High tides are starting to threaten homes and roads.	- Increased levels of salinization affecting soil for agriculture. - Coastal erosion is destroying productive farmland. - Cost of sea defences.	- Ocean acidification is reducing fish stocks around the island. - Warmer temperatures are destroying fragile ecosystems such as coral reefs.			
Plants and Animals	About a quarter of animals and plants on Earth could become extinct. With warmer temperatures and changing rainfall environments will no longer be able to provide for the world's fragile ecosystems.	Management			Impacts of the Drought:		
Disease and Health	Warmer temperatures will increase the spread of infectious diseases like malaria. In addition, more frequent floods could cause more waterborne disease such as dysentery.	<ul style="list-style-type: none"> Campaigning internationally for a reduction in carbon emissions and are currently steering their economy towards a low carbon footprint. Investigation into buying land from Australia, India or Sri Lanka to relocate their population. Sea walls have been constructed to prevent erosion and flooding, especially around Malé (the capital).. 			Social	Economic	Environmental
Water Supply	People need freshwater to drink but with 1 billion people predicted to not have excess to enough water by 2025 due to climate change, this might cause several social, economic and environmental problems. E.g. fishing, irrigation and sanitation.				- Rural suicide rates increased – particularly amongst farmers. - People in rural areas left due to lack of water, putting more pressure on the population of cities.	- Water bills rose 20% in 2008. - The number of dairy farms reduced by more than half between 2002-2008. - Food prices rose as Australia became more dependent on imports.	- Energy from hydroelectric power (HEP) dams was reduced leading to more air pollution as Australia had to resort to fossil fuels. - Some rivers dried up wiping out the entire ecosystem.
Climate refugees	Climate refugees are people who are forced to leave their home due to the impact of climate change. This can be due to sea level rises or extreme weather conditions such as drought.				Responses:		
		<ul style="list-style-type: none"> Desalination plant built in Sydney Government paying out \$1.7million a day in drought relief to farmers Laws passed to ban car washing and limiting showers to 4 minutes Subsidising rainwater storage tanks for houses Water recycling through 'greywater' 					
Impacts of climate change on the UK.		Negative impacts of climate change for the UK			Positive impacts of climate change for the UK		
The UK's climate is also changing. It is expected to... <ul style="list-style-type: none"> Increase in average temperature. Have warmer, but wetter winters. Have warmer and drier summers. 		Coastal Flooding	Extreme Rainfall		Tourism		Environment
		<ul style="list-style-type: none"> Vulnerable low lying areas could flood homes and infrastructure. £120 billion worth of infrastructure at risk. Areas which could flood include the east of England and London. Increased coastal erosion and cost of more sea defences. Damage to the economy. 	<ul style="list-style-type: none"> Increase in extreme flash floods. Flood damage to homes and businesses. Costs of flooding could increase to £12billion per year by 2080. Soil contamination on farmland. 		<ul style="list-style-type: none"> More people likely to take holidays within the UK, especially in Devon and Cornwall. The economy could be boosted: helping to create new jobs. More income through taxes on purchases. More outdoor events could become common. 		<ul style="list-style-type: none"> New wetlands from coastal flooding could become established. New wildlife and plants could be drawn to the UK'.
However, not all the impacts to the UK will be negative, there are clear benefits for a changing climate.		Water Shortages	Extreme Heat		Farming		Industry
		<ul style="list-style-type: none"> Farmers will find it difficult to irrigate crops so many not be able to grow all crops so more imports needed, Water restrictions, with London and the south-east being worst affected. Industry may have to shut down during droughts e.g. power stations. 	<ul style="list-style-type: none"> Warmer weather can increase health problems. 2000 people died in 2003 heatwave in the UK. Infectious diseases such as malaria might spread. More bacteria breeds on food in hot weather, so more food poisoning. 		<ul style="list-style-type: none"> Agriculture productivity may increase under warmer conditions as growing seasons will be longer. Farmers could potentially grow new foods used to warmer climates. UK wine industry will be able to develop further 43% increase in sales from 2013 to 2014. 		<ul style="list-style-type: none"> Heating costs will fall. Construction industry will be boosted by the need to build sea defences. New designs produced to cope with conditions.

What is a landscape?		Relief of the UK	
A landscape has visible features that make up the surface of the land. Landscapes can be broken down into four 'elements'.		Relief of the UK can be divided into uplands and lowlands. Each have their own characteristics.	
Landscape Elements			
Physical		Biological	
<ul style="list-style-type: none"> Mountains Coastlines Rivers 	<ul style="list-style-type: none"> Vegetation Habitats Wildlife 		
Human		Variable	
<ul style="list-style-type: none"> Buildings Infrastructure Structures 	<ul style="list-style-type: none"> Weather Smells Sounds/Sights 		

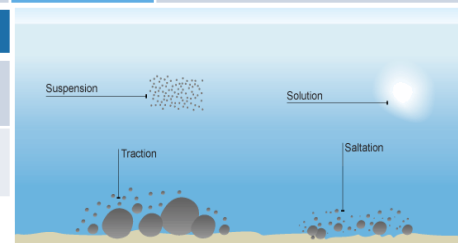


Erosion	
The break down and removal of rocks—over time they become more smooth, round and sorted.	
Attrition	Rocks hit together and bits break off, so they become smooth/smaller.
Solution	A chemical reaction that dissolves material within rocks.
Abrasion	Rocks hurled at the base of a cliff which breaks pieces off it.
Hydraulic Action	Water enters cracks in the cliff, air compresses, and this pressure causes the crack to expand.

Transportation	
A natural process by which eroded material is carried/moved.	
Solution	Minerals dissolve in water and are carried along.
Suspension	Sediment is carried along in the flow of the water.
Saltation	Pebbles that bounce along the sea/river bed.
Traction	Boulders that roll along a river/sea bed by the force of the flowing water.

Glaciation in the UK	
Over many thousands of years, glaciation has made an impression on the UK's landscape. Today, much of upland Britain is covered in u-shaped valleys and eroded steep mountain peaks.	
During the ice age	
Ice covered areas eroded and weathered landscapes to create dramatic mountain scenery.	
After the ice age	
Deep valleys and deposition of sediment revealed	

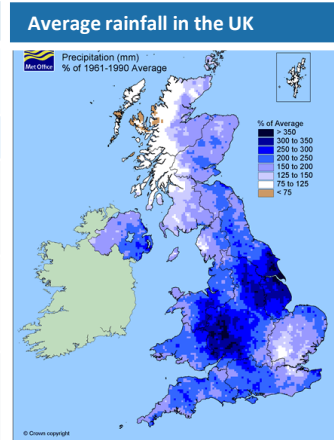
Human activity on Landscape		
Farming has changed the vegetation which grows there.	Much of the rural landscape has been replaced by urban sprawls.	Infrastructure such as roads and pylons cover most of the UK.
Over thousands of years, much of the UK's woodlands have gone.	Increasing population of the UK means more houses are needed.	UK's marshes and moorlands are heavily managed by people.



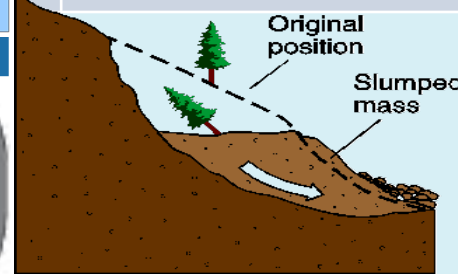
Topic 3 Distinctive Landscapes

Geology of the UK	
The UK is made from a variation of different rock types. The varied resistance of these rocks influences the landscape above.	
Igneous Rock Volcanic/molten rock brought up to the Earth's surface and cooled into solid rock.	
Sedimentary Rock Made from broken fragments of rock worn down by weathering on Earth's surface.	
Metamorphic Rock Rock that is folded and distorted by heat and pressure.	

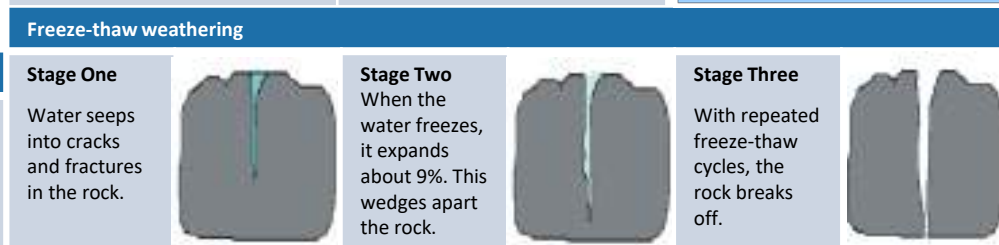
Climate and Weather in the UK	
The variations of climate and weather means there are different influences on the UK's landscape.	
Climate	Types of Weathering
The rainfall map of the UK shows variations in average rain. <ul style="list-style-type: none"> Less precipitation occurs in low land areas. East England Most precipitation occurs in upland areas. Scotland. <p><i>These differences mean...</i> Uplands experience more weathering, erosion and mass movement.</p>	<p>Mechanical Caused by the physical action of rain, frost and wind.</p> <p>Chemical Action of chemicals within rain dissolving the rock.</p> <p>Biological Rocks that have been broken down by living organisms.</p>



Mass Movement (sometimes called rotational slumping)	
A large movement of soil and rock debris that moves down slopes in response to the pull of gravity in a vertical direction.	
1	Rain saturates the permeable rock above the impermeable rock making it heavy.
2	Waves or a river will erode the base of the slope making it unstable.
3	Eventually the weight of the permeable rock above the impermeable rock weakens and collapses.
4	The debris at the base of the cliff is then removed and transported by waves or river.



Soil & Landscape	
<ul style="list-style-type: none"> Soils are created from weathered rocks, organic material and water. Rock types have influence over fertility of soil. Low-laying areas such as the Cambridgeshire Fens have deep soil whereas uplands have thin soil. Deep soil is more often associated with deciduous woodland rather than coniferous woodlands. 	



Deposition

When the sea or river loses energy, it drops the sand, rock particles and pebbles it has been carrying. This is called deposition.

Formation of Coastal Stack



Example: Old Harry Rocks, Dorset

- 1) Hydraulic action widens cracks in the cliff face over time.
- 2) Abrasion forms a wave cut notch between HT and LT.
- 3) Further abrasion widens the wave cut notch to form a cave.
- 4) Caves from both sides of the headland break through to form an arch.
- 5) Weather above/erosion below –arch collapses leaving stack.
- 6) Further weathering and erosion leaves a stump.

Coastal Defences

Hard Engineering Defences

Groynes	Wood barriers prevent longshore drift, so the beach can build up.	<ul style="list-style-type: none"> ✓ Beach still accessible. ✗ No deposition further down coast = erodes faster.
Sea Walls	Concrete walls break up the energy of the wave. Has a lip to stop waves going over.	<ul style="list-style-type: none"> ✓ Long life span ✓ Protects from flooding ✗ Curved shape encourages erosion of beach deposits.
Gabions or Rip Rap	Cages of rocks/boulders absorb the waves energy, protection the cliff behind.	<ul style="list-style-type: none"> ✓ Cheap ✓ Local material can be used to look less strange. ✗ Will need replacing.

Soft Engineering Defences

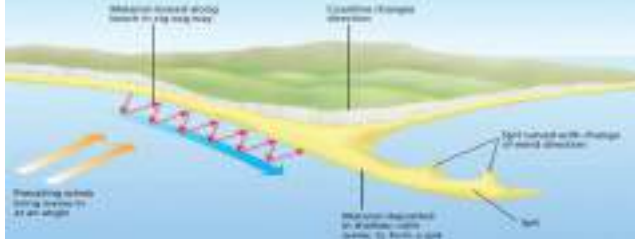
Beach Nourishment	Beaches built up with sand, so waves have to travel further before eroding cliffs.	<ul style="list-style-type: none"> ✓ Cheap ✓ Beach for tourists. ✗ Storms = need replacing. ✗ Offshore dredging damages seabed.
Managed Retreat	Low value areas of the coast are left to flood and erode naturally.	<ul style="list-style-type: none"> ✓ Reduce flood risk ✓ Creates wildlife habitats. ✗ Compensation for land.

Formation of Bays and Headlands



- 1) Waves attack the coastline.
- 2) Softer rock is eroded by the sea quicker forming a bay, calm area cases deposition.
- 3) More resistant rock is left jutting out into the sea. This is a headland and is now more vulnerable to erosion.

Formation of Coastal Spits - Deposition



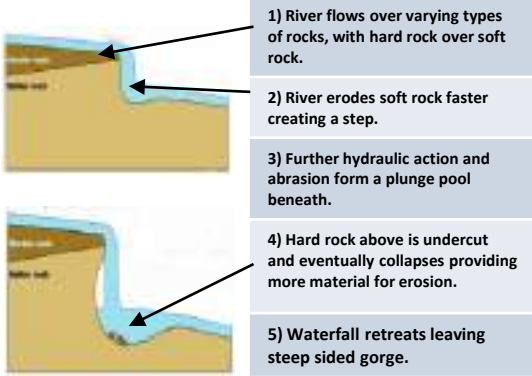
Example: Spurn Head, Holderness Coast

- 1) Swash moves up the beach at the angle of the prevailing wind.
- 2) Backwash moves down the beach at 90° to coastline, due to gravity.
- 3) Zigzag movement (Longshore Drift) transports material along beach.
- 4) Deposition causes beach to extend, until reaching a river estuary.
- 5) Change in prevailing wind direction forms a hook.
- 6) Sheltered area behind spit encourages deposition, salt marsh forms.

Upper Course of a River

Near the source, the river flows over steep gradient from the hill/mountains. This gives the river a lot of energy, so it will erode the riverbed vertically to form narrow valleys.

Formation of a Waterfall

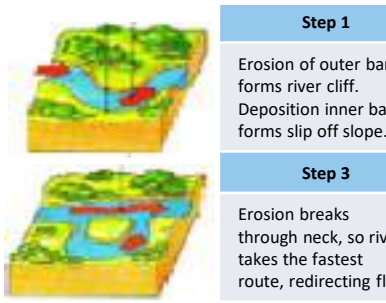


- 1) River flows over varying types of rocks, with hard rock over soft rock.
- 2) River erodes soft rock faster creating a step.
- 3) Further hydraulic action and abrasion form a plunge pool beneath.
- 4) Hard rock above is undercut and eventually collapses providing more material for erosion.
- 5) Waterfall retreats leaving steep sided gorge.

Middle Course of a River

Here the gradient gets less steep, so the water has less energy and moves more slowly. The river will begin to erode laterally (sideways) making the river wider.

Formation of Ox-bow Lakes



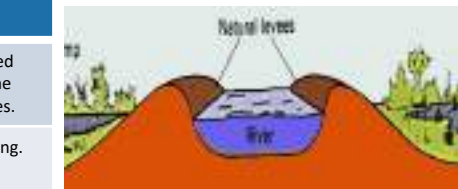
- | | |
|---------------|--|
| Step 1 | Erosion of outer bank forms river cliff. Deposition inner bank forms slip off slope. |
| Step 2 | Further hydraulic action and abrasion of outer banks, neck gets smaller. |
| Step 3 | Erosion breaks through neck, so river takes the fastest route, redirecting flow |
| Step 4 | Evaporation and deposition cuts off main channel leaving an oxbow lake. |

Lower Course of a River

Near the river's mouth, the river widens further and becomes flatter. Material transported is deposited.

Formation of Floodplains and levees

When a river floods, fine silt/alluvium is deposited on the valley floor. Closer to the river's banks, the heavier materials builds up to form natural levees.



River Management Schemes

Soft Engineering

- ✓ **Afforestation** – plant trees soak up rainwater, reduces flood risk.
- ✓ **Demountable Flood Barriers** put in place when warning raised.
- ✓ **Managed Flooding** – naturally let areas flood, protect settlements.

Hard Engineering

- ✗ **Straightening Channel** – increases velocity to remove flood water.
- ✗ **Artificial Levees** – heightens river banks so flood water is contained.
- ✗ **Deepening or widening river** to increase capacity of water which can be held in a flood.

Case Study: The Jurassic Coast

Location and Background: Located along the south coast in the counties of Dorset and Devon. The coast extends 155km from Exmouth in Devon to Poole in Dorset.

Geomorphic Processes

- Old Harry Rocks are made from resistant chalk. Features: wave-cut platforms, caves and stacks
- West from Old Harry Rocks, Lulworth Cove has been formed because the rock types run parallel to the sea (concordant coastline).
- Further west, Chesil Beach is a tombolo which joins the Isle of Portland to the mainland. This formed initially as a coastal spit created by continual deposition from LSD that extended out to sea until it reached the island.
- In Devon (the western end of the coastline), the cliffs are softer sandstone, so more prone to erosion and slumping.

Management

- High population centres such as Lyme Regis are protected by 'hold the line' defence measures such as sea walls and rock armour.
- Underpopulated & economic centres, such as farmland, are under 'managed retreat' schemes.

Case Study: The River Thames

Location and Background: Located in the South East of England it flows from Thames Head in the Cotswolds to the mouth in Essex, travelling through London.

Geomorphic Processes

- Upper** – few features as lowland river – little gravitational potential energy.
- Middle** – Features include meanders and ox-bow lakes. One meander in London almost completely surrounds the Isle of Dogs.
- Lower** – Greater lateral erosion creates features such as floodplains & levees. Mudflats at the river's estuary.

Management

- Towns and cities such as Windsor and London are economically and socially important due to houses and jobs that are located there. Lots of tourist attractions.
- Jubilee river channel (artificial channel) caused flooding in Wraysbury and Staines – designed to prevent flooding further upstream in Windsor and Maidenhead.
- New housing developments e.g. Barking Riverside designed to reduce impact from flooding.

AIM: 'To investigate factors that influence coastal change along the Holderness Coast.'

Risk assessment



Theory

Hypothesis aims: 74

- 1 Some sections of the coastline are more likely to erode than others
- 2 Longshore drift occurs in a north to south direction along the coastline
- 3 Beach profiles will change along the coast related to coastal defences. Sand accumulation will be greater on up-drift sides of groynes.
- 4 Pebble size and shape decreases as you move from north to south along the coastline.

Reason location is suitable for physical enquiry:

Holderness is one of the fastest eroding coastlines in Europe. This demonstrates the impacts of coastal management quickly. It is reasonably close and does not take long to reach. Publicly accessible.

Method 1: Beach profile - Mableton

Sampling method: systematic sampling (fixed intervals)

Sample size: 3 sites (before, between and after the groynes.)

Description: Person A stands by the sea holding a ranging pole and person B holds a second ranging pole further up the beach. The angle between matching markers on each ranging pole is measured using a clinometer. 10 samples every 1/10th of the way along.

Strengths

- The method of data collection is simple to carry out.
- Systematic sampling is simple and has good coverage of the study area.
- Small gaps and No clustering of data



Weaknesses

- There may be some user error when taking readings with a clinometer.
- Ranging poles need to be held straight and prevented from sinking into the sediment, otherwise an inaccurate measurement will be taken.



Method 2: Exposed height of groynes - Hornsea

Sampling method: systematic sampling (Every 1/10th)

Sample size: 3 groynes

Description: Identify the updrift and downdrift using a compass. Use the meter ruler to measure from the top of the groyne to the surface of the sediment on each side.

Strengths

- The method clearly shows whether the groynes are working.
- The method of data collection is simple to carry out and does not need special equipment.
- Measurements were taken at both sides of the groyne making it easy to calculate the difference between them.

Weaknesses

- Measurements were not taken at the same point along each groyne as groynes were different lengths.
- Care should be taken to ensure that meter ruler is held straight and does not sink into the sand- otherwise an inaccurate reading could be taken.

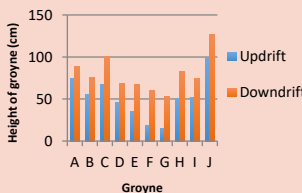
Tides	Risk of powerful waves, creating risk of drowning.	Students told not to go too close to the shore and to stay out of the sea. Consultation of tide timetables.
Cliff collapse	Danger of cliff collapse and falling rocks.	Avoid walking near the foot of cliff encase of cliff collapse. Students warned of this and kept well away from the back of the beach.
Weather	Wet weather is dangerous due to slippery groynes etc. Hot weather also poses the risk of dehydration.	Students advised to bring plenty of water and sun cream if the weather forecast is hot. If the weather forecast is wet, students are advised to bring appropriate clothing and footwear.

Presentation method: Bar chart to show the exposed height of the groynes



Strengths	Very clearly shows that updrift is less exposed than downdrift. Easy to see the pattern and compare data sets.
Weaknesses	Groynes are given letters- not possible to locate. Based on one reading from each side of the groyne. Difficult to read the decimal places of readings.
Alternative presentation techniques	Located bar graphs could have been used on a map of the beach to show where the most effective groynes were.

A bar graph to show the MEAN exposed height of groyne data



**Paper 1 – Physical Fieldwork
Holderness: Hornsea + Mableton**



Method 3: Sediment analysis

Sampling method: systematic sampling _ random

Sample size: 3 Pebbles every 1/10th along the transect

Description: A quadrat was placed on the ground and a random number generated table chose the location of the sample. The long axis was measured and its roundness categorised using a table

Strengths

- Simple method of data collection with little equipment needed.
- It is a quick and efficient way to collect the data needed.
- Using a visual chart makes the data more reliable for roundness (angularity).

Weaknesses

- Assessing the roundness using the chart is subjective.
- Small particles like sand were hard to categorise for roundness (angularity).
- The sample size was small-making the data less accurate.

Evaluation

Sample size	A larger pebble sample size should have been collected. More than one site between the groynes should have also been used. Therefore conclusions are based on limited data.
Weather / Season	The data was collected in the summer when the waves were more constructive and there were fewer storms. Doing this again in winter with destructive waves could show different beach profiles.
Tides	Due to the nature of the tides, we had limited time to collect our data. Going on multiple days would allow a larger sample.

Conclusion



Coastal management was effective at protecting areas. Groynes protected Hornsea but led to increased erosion at Mableton to the South. Mableton's rock groynes are effective too but also cause terminal groyne syndrome. Beaches between the groynes are steeper. Sediment size decrease along the coastline.



Results

1 Some sections of the coastline are more likely to erode than others	Areas behind the sea defences showed less erosion. The cliffs behind the unprotected areas has less vegetation and more slumping. Geological maps showed the boulder clay of Bridlington Bay erode quicker than the chalk headland, Flamborough Head.
2 Longshore drift occurs in a north to south direction along the coastline	The average exposed height of the groynes was less on the updrift side. Thus showing the groynes are effective in trapping sediment from LSD. Satsuma data was unreliable to demonstrate the direction of LSD.
3 Beach profiles will change along the coast related to coastal defences.	The beach between the groynes had the steepest overall gradient. The beach to the south of the groynes was the flattest. The average exposed height of the groynes was less on the updrift side. Groynes moved erosion to the south.
4 Pebble size and shape decreases as you move from north to south along the coastline.	There was a weak positive correlation that showed this might have been the case. Storm beaches were found behind sea defences, but not present on the unprotected area to the south.

AIM: 'To investigate if urban regeneration has created a more sustainable retail environment'.

Hypotheses 75

1. Areas that have been regenerated will be more **socially** sustainable.
2. Areas that have been regenerated will be more **economically** sustainable.
3. Areas that have been regenerated will be more **environmentally** sustainable

Reason location is suitable for physical enquiry:

Beverley is suitable as it is not too large a town to collect data in a day. It is close to Pocklington with good road links which make traveling to it easy. Toll gavel has not been redeveloped but Flemingate has. Differences between the two are mainly due to this regeneration. They have demographic, same proximity to big cities and climate.

Method 1: Questionnaire

Sampling method: Stratified/random sampling - locals were questioned however this turned into opportunistic sampling because there were few people on the days we went.
Sample size: 34 people were interviewed over two days – data shared between groups.
Description: Create a questionnaire which focuses on finding out people's opinions about Toll Gavel and Flemingate. We also collected data on age and distance travelled to see if these factors affected opinions.

<p>Strengths</p> <ul style="list-style-type: none"> -The method is a good way to collect data about. - The data collected can easily be collated and graphed to show the common opinions of the locals. - They are a cost-efficient way of collecting quantitative data. - They are a practical way to gather people's opinions. - Open and closed questions used. 	<p>Weaknesses</p> <ul style="list-style-type: none"> -People may lie especially if they are given options and their choice is not there. -Carrying out face to face questionnaires can be time consuming so a large sample size cannot be obtained in the time. - Not all age groups were equally represented
--	---

Method 2: Environmental Quality Survey

Sampling method: systematic sampling (fixed sites)
Sample size: 2 locations, two different types. Simple bipolar analysis and detailed Environmental Quality Survey
Description: Bi-polar analysis was a table scored 0-5 for 13 categories. EQS had written descriptors for score and weighted different sections differently for the score, depending on significance.

<p>Strengths</p> <ul style="list-style-type: none"> -Sites were chosen based on secondary research of Swanage. - Using a score system which goes from 0-5 was quick. - Using written descriptors was less subjective and more accurate. -A range of factors was assessed at each site. - Weighting due to significance (EQS) 	<p>Weaknesses</p> <ul style="list-style-type: none"> -Subjective score – collecting a mean score from groups reduced anomalies. -Lack of sites surveyed- so conclusion based on a small area. - Some factors being assessed were hard to define e.g. lonely vs sociable, weak vs strong
--	---

Risk assessment

Busy roads + railway	Risk of accident by walking along and crossing busy roads in the town.	Students told to only cross the road at the crossings. Railway lines were crossed using a bridge.
Injury	Risk of injuring through walking around the town such as tripping.	Students told to walk around the town in pairs or more. Each group carried a first aid kit and so did the teacher.
General public	Risk of verbal abuse from members of the public especially when carrying out questionnaires. Also risk of abduction.	Students told to walk around in pairs or more. Meeting point given to students to meet at regular times and a head count to be done. Students to be polite when asking questionnaires.

Methods carried out

1. Socially sustainable.	Toll gavel had a much wider range of shops than the redeveloped Flemingate. Whilst students may have preferred the copy shops and budget shops near the college in Flemingate, the wider range of shops and services were more popular in Toll Gavel. 88% of people thought it was a better retail environment.
2. Economically sustainable	The people count showed more people in Toll Gavel than Flemingate. This suggests that there are more people visiting those shops so they would sell more goods. The questionnaire did show that 79% of respondents thought Flemingate had improved and was better after the redevelopment.
3. Environmentally sustainable.	Flemingate was more environmentally sustainable. There were more green areas, a better kept built environment and better access to public transport in the form of bus and rail routes. There were more plants are trees.

Presentation method: Radar graphs (EQS & Bi-polar) + Land Use Map

Strengths	<ul style="list-style-type: none"> - Easy to compare the two locations. - Larger area on the graph easy to read. - Clearly see exact values 	<ul style="list-style-type: none"> - Easy to see spatial patterns - Colour coding of categories is quick and easy - Using different colours for categories makes it easy to understand.
Weaknesses	<ul style="list-style-type: none"> - Selective categories chosen as too many categories made it hard to read. 	<ul style="list-style-type: none"> - A lot of subtypes in retail. Using a different shade for each sub type made it hard to distinguish between a few.
Alternative presentation techniques	<ul style="list-style-type: none"> - Bar charts could have been used to compare these two locations. - Locating these graphs next to photos of the area would help link the findings with location. 	<ul style="list-style-type: none"> - This data could have been presented as a pie chart to show the proportion of land use in each location e.g. residential (housing) retail, unoccupied, etc. Subtypes could still be shades of one colour. E.g. retail subtypes are shades of red.

Evaluation

Time of day	The time of day drastically affected our results. At 10.10 am there were few shoppers about at Flemingate. At 12.30pm many people were on their lunch break when we visited Toll Gavel.
Day	Weekday meant there were a lot of students, but many people were at work. A contrasting weekend visit would balance this.
Bias	Most of the methods were open to some kind of bias. People may have lied on the questionnaires, the EQS is based on opinion and human error could have incorrectly categorised the shops.

**Paper 2 – Human Fieldwork
Beverley: Toll Gavel + Flemingate**

Method 3: Land Use Survey

Sampling method: Systematic sampling Toll Gavel but **total** sampling for Flemingate as there were few shops. Toll Gavel was more treble the size.
Sample size: 2 locations - ~30 businesses at each location.
Description: A detailed map showing the buildings was used to record the type of each building. To save time a key was used to categorise each type and subtype. E.g. B = retail, B2 = coffee shops

<p>Strengths</p> <ul style="list-style-type: none"> - Category system made it quick and easy to record data. - Maps showed individual buildings making it accurate to see. - The buildings were then colour coded to make it easy to show spatial patterns in the data. - 47 subcategories made it easy to collect precise land use. 	<p>Weaknesses</p> <ul style="list-style-type: none"> - Human error could have categorised some places incorrectly. - Two different sampling strategies were used to allow for equal sample sizes. - The maps used had some businesses on which no longer there and land use had changed. - Hard to reflect buildings with multiple land use. E.g. flats above.
---	---

Conclusion

Flemingate is not a more sustainable retail environment than Toll Gavel. Whilst it is environmentally sustainable, it's modern architecture and focus on a narrow variety of shops catering towards younger people do not prove popular with people visiting. Toll Gavel's wider range of shops and services with its historic appeal wins the shoppers' votes.

Results

1. Questionnaire	88% (30/34) of people thought Toll Gavel was a better retail environment. The main reasons given were that it was more historic, had a wider range of good and services. 79% of respondents thought Flemingate had improved and was better after the redevelopment. Only 15% of people in Toll Gavel vs 24% of people in Flemingate used public transport.
2. Environmental Quality Survey	The EQS in Flemingate was 81 and in Toll Gavel was 74. The main differences were due to the conditions of the buildings and paths in the town centre and a lack of vegetation. This historic charm though attracts tourists so repairing the old buildings fully would detract from the town.
3. Land Use Survey	Flemingate had a narrower range of shops and focused on services that might attract younger people. E.g. The sixth form college, Jump Inc, Cinema, as well as coffee shops. Budget shops such as Poundland targeted students. Beverley had a much great range of shops and services with a wider range of budgets.

Global pattern of air circulation	
Atmospheric circulation is the large-scale movement of air by which heat is distributed on the surface of the Earth.	
Hadley cell	Largest cell which extends from the Equator to between 30° to 40° north & south.
Ferrel cell	Middle cell where air flows polewards between 60° & 70° latitude.
Polar cell	Smallest & weakest cell that occurs from the poles to the Ferrel cell.



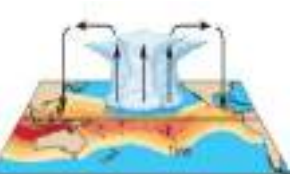
Distribution of Droughts
Drought can occur anywhere throughout the world but they are more frequent between the tropics of Cancer and Capricorn. Many countries in Africa suffer from severe drought, such as Ethiopia but Australia also suffer.
Causes of Drought and floods: El Nino effect

The El Nino effect is also associated with creating dry conditions.



Normally, **warm ocean currents** off the coast of Australia cause **moist warm air** to rise and **condense** causing storms and **rain** over Australia.

In an El Niño year (every 2-7 years) the **cycle reverses**. Cooler water off the coast of Australia reverses the wind direction leading to **dry, sinking air** causing **hot weather** and a **lack of rainfall** over Australia and warm, wet air over South America causing storms and floods.



Distribution of Tropical Storms.
They are known by many names, including hurricanes (North America), cyclones (India) and typhoons (Japan and East Asia). They all occur in a band that lies roughly between the tropics of Cancer and Capricorn (5-15Degrees N and S of the Equator) and despite varying wind speeds are ferocious storms. Some storms can form just outside of the tropics, but in general the distribution of these storms is controlled by the places where sea temperatures rise above 27°C.

Formation of Tropical Storms	
1	The sun's heats large areas of ocean in the summer and autumn. This causes warm, moist air to rise over the particular spots
2	Once the temperature is 27°, the rising warm moist air leads to a low pressure. This eventually turns into a thunderstorm. This causes air to be sucked in from the trade winds.
3	With trade winds blowing in the opposite direction and the rotation of earth involved (Coriolis effect), the thunderstorm will eventually start to spin.
4	When the storm begins to spin faster than 74mph, a tropical storm (such as a hurricane) is officially born.
5	With the tropical storm growing in power, more cool air sinks in the centre of the storm, creating calm, clear condition called the eye of the storm.
6	When the tropical storm hit land, it loses its energy source (the warm ocean) and it begins to lose strength. Eventually it will 'blow itself out'.



Climate Zones	
The global circulation system controls temperatures by influencing precipitation and the prevailing winds. This creates distinctive climate zones.	
Temperate Climate	Mid-latitude, 50° - 60° north & south of the Equator. Here air rises and cools to form clouds and therefore frequent rainfall. e.g. UK.
Tropical Climate	Found along the Equatorial belt, this zones experiences heavy rainfall and thunderstorms. E.g. Brazil.
Polar Climate	Within the polar zones cold air sinks causing dry, icy and strong winds. E.g. Antarctica.
Desert Climate	30° north and south of the equator, sinking dry airs leads to high temperatures without conditions for rainfall. E.g. Libya.

Topic 1 Global Hazards

Extremes in weather conditions

The Atacama, Chile
The Andes mountains block moist warm air from travelling further west. This causes rainfall to the east of the mountains, but a rain shadow to the west. Average annual rainfall of 15mm.

Cherrapunji, Khasi Hills, India
This town sees a lot of rain each year (11m per yr). This is due to the reversal of air conditions/directions from sea to land. As clouds travel from the bay of Bengal over Bangladesh they are forced to rise once they reach the Khasi Hills, causing relief rainfall. In the summer, this contributes to monsoons.

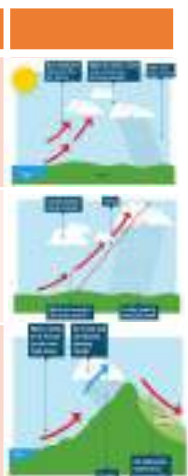
High and Low Pressure	
High Pressure	Low Pressure
Caused by cold air sinking. Causes clear and calm weather	Caused by hot air rising. Causes stormy, cloudy weather.

What is wind?
Wind is the movement of air from an area of high pressure to one of low pressure.



Types of wind	
Katabatic Winds	Winds that carry air from the high ground down a slope due to gravity. e.g. Antarctic.
Trade Winds	Wind that blow from high pressure belts to low pressure belts.
Jet Streams	These are winds that are high in the atmosphere travelling at speeds of 225km/h.

Types of precipitation	
Convectonal Rainfall	When the land warms up, it heats the air enough to expand and rise. As the air rises it cools and condenses. If this process continues then rain will fall.
Frontal Rainfall	When warm air meets cool air an front is formed. As the warm air rises over the cool air, clouds are produced. Eventually steady rain is produced.
Relief Rainfall	When wind meets mountains, the warm air is forced to rise quickly and cool. This leads condensation and eventually rainfall. When the air descend however, little very rainfall falls, creating a rain shadow.



Changing pattern of these Hazards	
Tropical Storms	Scientists believe that global warming is having an impact on the frequency and strength of tropical storms. This may be due to an increase in ocean temperatures.
Droughts	The severity of droughts have increased since the 1940s. This may be due to changing rainfall and evaporation patterns related to gradual climate change.

Case Study: The Big Dry Australian Drought

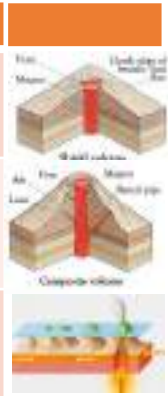
Causes	
Drought in Australia is often caused by El Niño.	
Effects	Management
<ul style="list-style-type: none"> Crop failure and dried vegetation. Bush fires killed 180 people. Animals died from starvation and dehydration The number of sheep fell by 6 million. Rural suicide rates increased 	<ul style="list-style-type: none"> Severe restrictions on water usage put in place. Building of new reservoirs and wells. Farmers now use drought-tolerant crops. Campaign on educating Australia's population

Case Study: Typhoon Haiyan 2013

Causes	
Started as a tropical depression on 2 nd November 2013 and gained strength. Became a Category 5 "super typhoon". Main impact on the Philippines.	
Effects	Management
<ul style="list-style-type: none"> Almost 4,000 deaths. 130,000 homes destroyed Water and sewerage systems destroyed causing diseases. Emotional grief for lost ones. 	<ul style="list-style-type: none"> The UN raised £190m in aid. USA & UK sent helicopter carrier ships deliver aid remote areas. Education on typhoon preparedness.

The structure of the Earth	
The Crust	Varies in thickness depending whether it is below oceans or continents. Made up of plates.
The Mantle	Thickest layer (2900km). The heat and pressure means the rock is in a liquid state that is in a state of convection.
The Inner and Outer Core	Hottest section (5000 degrees). Mostly made of iron and nickel and is 4x denser than the crust. Inner section is solid whereas outer layer is liquid.

Types of volcanoes	
Shield	Made of basaltic rock and form gently sloping cones from layers of runny lava. Location: hot spots and constructive margins. Eruptions: gentle and predictable
Composite	Most common type found on land. Created by layers of ash and lava as the lava is thick and viscous. Location: Destructive margins Eruptions: explosive and unpredictable due to the build of pressure within the magma chamber.
Hotspots	These happen away from any plate boundaries. They occur because a plume of magma rises to eat into the plate above. Where lava breaks through to the surface, active volcanoes can occur above the hot spot. E.g. Hawaii.



Volcanic Hazards	
Ash cloud	Small pieces of pulverised rock and glass which are thrown into the atmosphere.
Gas	Sulphur dioxide, water vapour and carbon dioxide come out of the volcano.
Lahar	A volcanic mudflow which usually runs down a valley side on the volcano.
Pyroclastic flow	A fast moving current of super-heated gas and ash (1000°C). They travel at 450mph.
Volcanic bomb	A thick (viscous) lava fragment that is ejected from the volcano.



Convection Currents	
The Lithosphere is divided into plates which move due to ridge pull and slab push, plus convection currents in the asthenosphere.	
1	Radioactive decay of some of the elements in the core and mantle generate a lot of heat.
2	When lower parts of the asthenosphere heat up they become less dense and slowly rise .
3	As they move towards the top they cool down, become more dense and slowly sink .
4	These circular movements of semi-molten rock are convection currents
5	Convection currents create drag on the base of the tectonic plates and this combines with ridge push and slab pull to cause movement.

Case Study: Nepal Earthquake, 2015	
Causes	<ul style="list-style-type: none"> The Indian and Eurasian plates push together - Collision plate boundary. The main earthquake occurred 25th April 2015, magnitude 7.8. Numerous aftershocks including one of 7.3 magnitude between 25th April and 12th May.
Effects	547 landslides, including several on Mt Everest. 180 buildings turned to rubble in Kathmandu. 19,009 people injured and 8635 people killed. \$10 billion worth of damage caused. Thousands made homeless and had to sleep outside. Schools, hospitals and other services closed.
Management	British government gave £33million. India provided emergency aid including 50 tonnes of water and 22 tonnes of food. NGO's e.g. Red Cross aided injured/homeless. Long-term 'cash for work' projects were set up where people were paid to work rebuilding their own communities.

Managing Volcanic Eruptions	
Warning signs	Monitoring techniques
Small earthquakes are caused as magma rises up.	Seismometers are used to detect earthquakes.
Temperatures around the volcano rise as activity increases.	Thermal imaging and satellite cameras can be used to detect heat around a volcano.
When a volcano is close to erupting it starts to release gases.	Gas samples may be taken and chemical sensors used to measure sulphur levels.
Preparation	
Creating an exclusion zone around the volcano.	Being ready and able to evacuate residents.
Having an emergency supply of basic provisions, such as food	Trained emergency services and a good communication system.

Types of Plate Margins	
Destructive Plate Margin	
When the denser oceanic plate subducts beneath the other plate (usually continental), friction causes it to melt and become molten magma. The magma forces its way up to the surface to form a volcano. This margin is also responsible for devastating earthquakes.	
Constructive Plate Margin	
Here two plates are moving apart causing new magma to reach the surface through the gap. Volcanoes formed along this fault can cause a submarine (underwater) mountain range such as those in the Mid Atlantic Ridge.	
Conservative Plate Margin	
A conservative plate boundary occurs where plates slide past each other in opposite directions, or in the same direction but at different speeds. This is responsible for earthquakes such as the ones that happening along the San Andreas Fault, USA.	
Collision Zones	
Collision zones form when two continental plates collide. Neither plate is forced under the other, and so both are forced up and form fold mountains. These zones are responsible for shallow earthquakes in the Himalayas.	

Causes of Earthquakes	
Earthquakes are caused when two plates become locked causing friction to build up. From this stress , the pressure will eventually be released, triggering the plates to move into a new position. This movement causes energy in the form of seismic waves , to travel from the focus towards and the epicentre . As a result, the crust vibrates triggering an earthquake.	
The point directly above the focus, where the seismic waves reach first, is called the EPICENTRE .	
SEISMIC WAVES (energy waves) travel out from the focus.	
The point at which pressure is released is called the FOCUS .	
Depth of Earthquake	
Shallow Focus	Deep Focus
-Usually small and common. -Seismic waves spread and damage wide area.	-Occur on destructive margins. -Damage is localised as seismic waves travel vertically.

Earthquake Management	
PREDICTING	
Methods include:	
<ul style="list-style-type: none"> Satellite surveying (tracks changes in the earth's surface) Laser reflector (surveys movement across fault lines) Radon gas sensor (radon gas is released when plates move so this sensor detects it) Seismometer Water table level (water levels fluctuate before an earthquake). Scientists also use seismic records to predict when the next event will occur. 	

How do we measure earthquakes?	
Mercalli Scale	Richter Scale
<ul style="list-style-type: none"> Measures how much damage is caused, based on observations, not scientific instruments. Base from 'Instrument' and 'Weak' to 'Extreme' and 'Cataclysmic'. Limitations is that its subjective due to it being based on perception. 	<ul style="list-style-type: none"> Is a scientific measurement based on the energy released. Measured by seismometers using measurement from 1 – 10 Logarithmic – each point up the scale is 10 times greater than the one before.

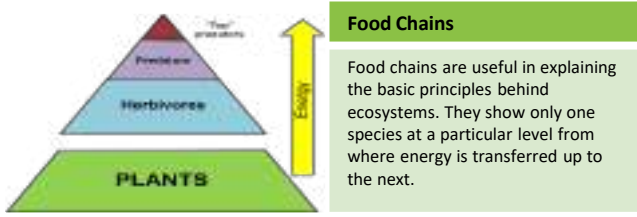
PROTECTION	
You can't stop earthquakes, so earthquake-prone regions follow these three methods to reduce potential damage:	
<ul style="list-style-type: none"> Building earthquake-resistant buildings Raising public awareness Improving earthquake prediction 	
Earthquake proof buildings ideas	
1. Counter-weights to the roof to help balance any swaying.	2. Roof made from reinforced cement concrete.
3. Foundations made from reinforced steel pillars, bail-bearings or rubber.	4. Windows fitted with shatter-proof glass to reduce breakage.
5. Lightweight materials that cause minimal damage if fallen during an earthquake.	6. Ensure gas pipes have an automatic shut off to prevent risk of fire.

What is an Ecosystem?

An ecosystem is a system in which organisms interact with each other and with their environment.⁸

Ecosystem's Components

Abiotic	These are non-living, such as air, water, heat, rock.
Biotic	These are living, such as plants, insects, and animals.
Flora	is plant life occurring in a particular region or time.
Fauna	is all animal life of any particular region or time.



Nutrient cycle

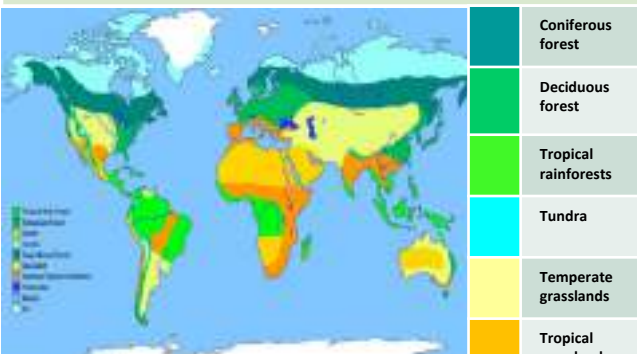
Plants take in those nutrients where they are built into new organic matter. Nutrients are taken up when animals eat plants and then returned to the soil when animals die and the body is broken down by decomposers.

Litter	This is the surface layer of vegetation, which over time breaks down to become humus.
Biomass	The total mass of living organisms per unit area.



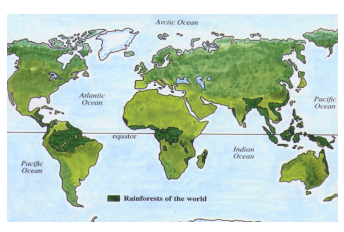
Biomes

A biome is a large geographical area of distinctive plant and animal groups, which are adapted to that particular environment. The climate and geography of a region determines what type of biome can exist in that region.



The most productive biomes – which have the greatest biomass- grow in climates that are hot and wet.

Tropical Rainforest Biome



Tropical rainforests are centred along the Equator between the Tropic of Cancer and Capricorn. Rainforests can be found in South America, central Africa and South-East Asia. The Amazon is the world's largest rainforest and takes up the majority of northern South America, encompassing countries such as Brazil and Peru.



Convictional rainfall

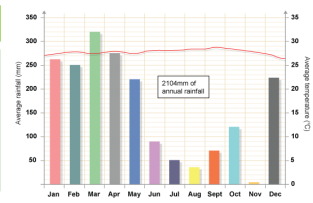
- The roots of plants take up water from the ground and the rain is **intercepted** as it falls.
- As the rainforest heats up, the water evaporates into the atmosphere.
- Finally, the water condenses and forms clouds to make the next day's rain.

Rainforest nutrient cycle

The hot, damp conditions on the forest floor allow for the rapid decomposition of dead plant material. This provides plentiful nutrients that are easily absorbed by plant roots. However, as these nutrients are in high demand from the many fast-growing plants, they do not remain in the soil for long and stay close to the surface. If vegetation is removed, the soils quickly become infertile

Climate of Tropical Rainforests

- Evening temperatures rarely fall below 22°C
- Due to the presence of clouds, temperatures rarely rise above 32°C
- Most afternoons have heavy showers
- At night with no clouds insulating temperature drops



Topic 4 Sustaining Ecosystems

Interdependence in the rainforest

A rainforest works through interdependence. This is where the plants and animals depend on each other for survival.

Layers of the Rainforest

Emergent	Highest layer with tree reaching 50 metres.
Canopy	Most life is found here as it receives 70% of the sunlight and 80% of the light.
U-Canopy	Consists of trees that reach 20 metres high.
Shrub Layer	Lowest layer with small trees that have adapted to living in the shade.




Rainforest soil profile

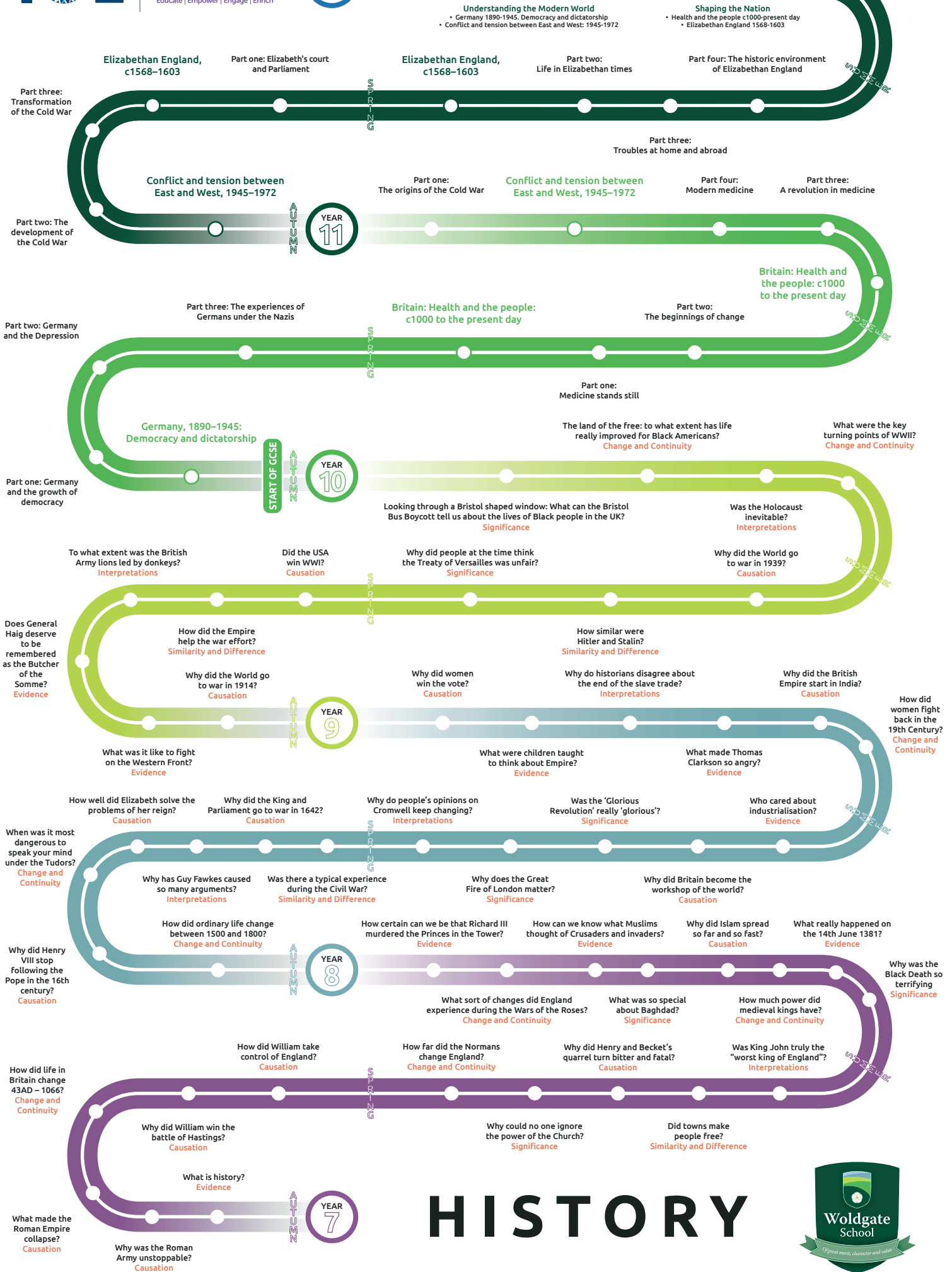
Leaf Litter	Thin litter layer rapidly decomposes in heat.
Top Soil	Shallow topsoil is a mixture of decomposed organic matter and minerals.
Sub Soil	The sub-soil is deep due to weathering of rocks below.
Rock	Underlying rock weathers quickly at high temperatures to form sub-soil.

Biome's climate and plants

Biome	Location	Temperature	Rainfall	Flora	Fauna
Topical rainforest	Centred along the Equator.	Hot all year (25-30°C)	Very high (over 200mm/year)	Tall trees forming a canopy; wide variety of species.	Greatest range of different animal species. Most live in canopy layer
Tropical grasslands	Between latitudes 5°- 30° north & south of Equator.	Warm all year (20-30°C)	Wet + dry season (500-1500mm/year)	Grasslands with widely spaced trees.	Large hoofed herbivores and carnivores dominate.
Hot desert	Found along the tropics of Cancer and Capricorn.	Hot by day (over 30°C) Cold by night	Very low (below 300mm/year)	Lack of plants and few species; adapted to drought.	Many animals are small and nocturnal: except for the camel.
Temperate forest	Between latitudes 40°- 60° north of Equator.	Warm summers + mild winters (5-20°C)	Variable rainfall (500-1500m /year)	Mainly deciduous trees; a variety of species.	Animals adapt to colder and warmer climates. Some migrate.
Tundra	Far Latitudes of 65° north and south of Equator	Cold winter + cool summers (below 10°C)	Low rainfall (below 500mm/ year)	Small plants grow close to the ground and only in summer.	Low number of species. Most animals found along coast.
Coral Reefs	Found within 30° north – south of Equator in tropical waters.	Warm water all year round with temperatures of 18°C	Wet + dry seasons. Rainfall varies greatly due to location.	Small range of plant life which includes algae and sea grasses that shelters reef animals.	Dominated by polyps and a diverse range of fish species.

Tropical Rainforest Biome			Polar/Tundra Regions Biome		
Adaptations to the rainforest		Rainforest inhabitants	Distribution of Polar Regions		Climate Change on Polar Regions
Sloths	Are camouflaged to forest environment.	Many tribes have developed sustainable ways of survival, such as shifting cultivation. The forest provides inhabitants with... <ul style="list-style-type: none"> • Food through hunting and gathering. • Natural medicines from forest plants. • Homes and boats from forest wood. 	Arctic	Antarctic	Scientific reports outline the effect global warming is having on these regions. Ice sheets and glaciers are melting at an alarming rate leading to fears of rising sea levels. Thawing of permafrost is increasing methane emissions and the decline of arctic ice is creating waves that are capable of causing unseen coastal erosion.
Buttress Roots	Support tall trees & absorb nutrients.		Is the region north of latitude 60°N around the North Pole.	A continent south of latitude 60°S around the South Pole.	
Drip Tips	Allows heavy rain to run off leaves easily				
Lianas & Vines	Climbs trees to reach sunlight at canopy.				
Effects of Human Activity on the Rainforest		Benefits of the rainforest	Arctic soil profile		
Logging	Agriculture	Raw Materials	Active Layer		
<ul style="list-style-type: none"> • Most widely reported cause of destructions to biodiversity. • Timber is harvested to create commercial items such as furniture and paper. • Has led to violent confrontation between indigenous tribes and logging companies. 	<ul style="list-style-type: none"> • Large scale 'slash and burn' of land for ranches and palm oil. • Increases carbon emission. • River saltation and soil erosion increasing due to the large areas of exposed land • Increase in palm oil is making the soil infertile. 	Commonly used materials such as timber and rubber are found here.	Thaws in the summer. Becomes deeper towards pole.		
		Water	Permafrost		
		Controls the flow of water to prevent floods/droughts regions..	Permanently frozen all year. Layer Increases further north.		
		Food	Bed Rock		
		Important foods such as Bananas, pineapples and coffee are grown there.	Low temperatures weathers rock slowly = less nutrients.		
Mineral Extraction	Tourism	Health	Effects of Human Activity in Polar Regions		
<ul style="list-style-type: none"> • Precious metals are found in the rainforest. • Areas mined can experience soil and water contamination. • Indigenous people are becoming displaced from their land due to roads being built to transport products. 	<ul style="list-style-type: none"> • Mass tourism is resulting in the building of hotels in extremely vulnerable areas. • Lead to negative relationship between the government and indigenous tribes • Tourism has effected wildlife (apes) by exposing them to human diseases. 	25% of modern medicines are sourced from rainforest ingredients.	Oil & Gas exploration		Whaling
		Energy	Arctic		<ul style="list-style-type: none"> • Arctic holds a large amount of untapped oil and gas. • Oil spills would threaten ecosystems as clean up operations would be slow.
		Large dams generate 2/3 of Brazil's energy needs.	Large areas are permafrost. At sea, most of the region is frozen sea ice.		
		Climate	Antarctic		Fishing
		Acts as carbon sinks by storing 15% of carbon emissions.	Large and thick ice sheets on land. A mountain range crosses the continent.		
Case Study: Sustainable Rainforest Management in Costa Rica			Land & Sea Features		Tourism
Location & Background		Threats to the Costa Rican Rainforest	Arctic		<ul style="list-style-type: none"> • Has made area possible to fish large untapped stocks. • The polar areas are difficult to police due to harsh conditions. • Collapse of the fish stocks there might damage ecosystems.
Costa Rica is a small country in Central America. It is home to 6% of the world's biodiversity. The country attracts 6 million tourists a year.		<ul style="list-style-type: none"> • Cattle Ranching and agricultural development by clearing land through slash & burn methods. • Gold and other metal mining meant large scale soil and rock removing. This meant areas were deforested and chemicals entered water systems. • By 1990, 32,000 hectors of forest were cut down each year – devastating the fragile ecosystem. 	Large areas are permafrost. At sea, most of the region is frozen sea ice.		
Ecotourism		Rainforest Management	Antarctic		Case Study: Small Scale Sustainable Management: Clyde River Marine Wildlife Area
Ecotourism is tourism that is directed towards the natural environments & conversation. Samasati is a popular ecotourism destination in the country.		<ul style="list-style-type: none"> • Government created 28 National Parks with 24% of the country's land protect. • Laws and enforcement led to deforestation falling from 1.8% in the 1970's to below 0.1% by 2005. • Agroforestry encourages growing trees and crops together to create better farming conditions. • Afforestation has led to the replanting of trees to replace original forest that have been lost. • Selective logging – only cutting down trees when they reach a certain height. 	Large and thick ice sheets on land. A mountain range crosses the continent.		
Advantages			Flora (Plants)		Case Study: Global Scale Sustainable Management: The Antarctic Treaty System
<ul style="list-style-type: none"> • No trees destroyed to build the resort – buildings built to fit between trees. • Timber from afforestation project in Costa Rica. • Only employs local people. 			There are very few plants in polar areas – some lichens, mosses and grasses along the coastal areas.		Background
Disadvantages			Fauna (Animals)		Signed by 46 nations in 1961, the Treaty sets aside Antarctica as a scientific preserve, establishes freedom of scientific investigation and bans military activity.
<ul style="list-style-type: none"> • Still large amounts of air pollution to get there from planes etc. 			Relatively few species of animals. Polar Bears, Penguins and marine mammals like whales, seals and walrus are examples.		
			Sustainable Management		Basic Principles of the Antarctic Treaty
			<ul style="list-style-type: none"> • 2 deep offshore troughs of zooplankton to feed migrating Bowhead whales • Supports the ecosystem and other animals including narwhals and polar bears. • Allows small scale sustainable hunting of whales by local Inuit people, therefore supporting their community but also providing a sustainable management strategy for whale populations. 		<ul style="list-style-type: none"> • Bans mining and resource extraction. • Prevents territorial disputes of the continent. • Promotes scientific research and co-operation. • Protects the fragile environments and its wildlife by preventing and managing waste/pollution.
					Successful?
					Stayed in place for 50 years with more countries signing up to enforce strict controls and improve its stability.

GCSE EXAMINATIONS



HISTORY



Medieval beliefs about the causes of illness:

- **Punishment from God:** Most common belief that was that illness was sent as a punishment from God for sin.
- **Bad air:** People believed that miasma caused illness. Some people could link bad air to filth on the streets but could not explain what the link was.
- **Astrology:** Illness was sometimes linked to the movement of the planets and astrology.
- **Unbalanced humours:** British physicians had been trained using Hippocrates and Galen's books, so believed that people became ill when their humours were unbalanced.

Preventing, diagnosing and treating illness:

- **Urine chart:** Testing urine for colour, smell, thickness and taste.
- **Bleeding:** Letting blood flow from the arm, sometimes using illnesses. Some monks were bled 7-12 times a year to prevent illness.
- **Cleaning the streets:** 1349 – Edward III ordered the Mayor of London to clean the filth from the streets.
- **Zodiac man:** Chart showed doctors when to treat certain parts of the body.
- **Herbal remedies:** Made from herbs and minerals, from books called 'herbals'.

Medieval doctors:

Physicians	Surgeons	Wise Women	Apothecaries
University trained for 7 years on the work of Galen. Controlled by the Church who supported old ideas. No hands-on training. Very few physicians and expensive.	Trained as apprentices. Basic surgery (amputations and bleeding) and haircuts. Less respected than physicians. Some trained on the battlefield.	Natural and herbal remedies. Knowledge passed down through generations. Also acted as midwives. Reasonably priced treatment.	Dispensed medicines and herbs from a shop. Sold medicines to doctors. Apprentice for 7 years. Sold 'simples (one ingredient) and 'compounds'.

Key individuals:

Name	Description
Hippocrates of Kos	Taught that people got ill because of the Four Humours (blood, phlegm, yellow bile, and black bile). Said that these humours needed to be balanced to stay healthy. Also taught doctors to examine patients carefully.
Claudius Galen	Built on the work of Hippocrates. Developed the Theory of Opposites (that you had to balance the humours by doing the opposite). Wrote over 350 books on all areas of medicine, proved the brain controlled speech, and said that people should dissect humans to find out about the body, and if this was not possible, use apes. Supported by the Church as he claimed the human body was so perfect it must have been made by one god.
Rhazes	Wrote over 50 books on the ideas of Hippocrates and Galen. Emphasised the importance of carefully diagnosing illnesses and described smallpox and measles accurately.
Ibn Sina	Encouraged scientific observation and the importance of cleanliness. Wrote a range of books e.g. the Canon of Medicine which described over 700 drugs and their uses. Main medical textbook until the 17 th Century.
Al-Zahrawi	Expert in surgery. Produced books showing complex abdominal operations and 200 surgical instruments.
Ibn-al-Nafis	Argued against Galen's belief that blood was produced by the liver and burnt up by the body as a nutrient.
John Bradmore	Developed a new forcep to remove an arrow lodged in Prince Henry's cheek. Dressed the wound with barley and honey and it healed, free of infection.
Henri de Mondeville	Taught that wounds should be bathed and cleaned, then closed quickly, contrary to Galen who said that pus should be allowed to form to carry away poisoned blood.

Christianity and medicine:

- **Preserving knowledge:** Copied ancient Greek and Roman books to prevent knowledge being lost. Monks made these copies by hand.
- **Education and training:** Controlled universities and supported Galen. Roger Bacon was imprisoned for saying doctors should do their own research.
- **Cause and treatment:** God sent illness, so the only way to prevent it was to pray and commit less sin. To look for other explanations was to challenge the Church.
- **Hospitals:** Hospitals were in monasteries – 500 by 1400. Cared for sick and old people with prayer, herbal remedies and rest. No infectious diseases.

Islam and medicine:

- **Hospitals:** Islam encouraged a good diet, exercise and hygiene. As such, there were many advanced hospitals with different wards and nursing care for patients. By 1100, every large town in the Islamic world had a hospital. Physicians trained in hospitals. Hospitals were open to all.
- **Preserving knowledge:** Greek medical textbooks were translated into Arabic. Islamic physicians built on the ideas of the Greeks and Roman, composing multi-volume medical encyclopaedias which organised medical knowledge. These books were later translated into Latin and used in Europe.

Public health in monasteries

- **Health in monasteries was better. For example:**
 - ✓ Water was used to flush the latrines which drained into ditches
 - ✓ Reservoirs stored incoming water for when it was needed
 - ✓ Pipes brought water into the washrooms, bakery, kitchen etc.
 - ✓ Drains took rainwater and waste away from the abbey
- **This was because:**
 - ✓ Monasteries were wealthy, so they could afford water supplies and sanitation
 - ✓ They were built close to rivers in isolated places, so could draw fresh water
 - ✓ Monks were expected to keep clean

Surgery in medieval times:

Treatments	Problems	Training
Most surgery was performed by barber surgeons, who offered blood-letting, tooth extraction and amputations as well as haircuts. They could also remove small tumours on the skin's surface. They could not do complex operations inside the body.	<ul style="list-style-type: none"> • Pain: Surgeons used herbs such as opium or hemlock to make patients drowsy but performed amputations and other surgery without pain relief. • Infection: Wine, vinegar or honey could be used to clean wounds, but infection could not be prevented. • Bleeding: Large cuts were sewn up or cauterised. Surgeons could not stop heavy bleeding. 	Surgeons did not go to university but trained through observing others. They improved their skills through practise and reading books on surgery.

The Black Death (1348):

Explanations: <ul style="list-style-type: none"> • God's punishment – plague was punishment for sin • Miasma – bad air was spreading disease • Astrology – the planet had moved into a new constellation of stars • Theory of the Four Humours – people were 'stuffed with evil humours' 	
Prevention: <ul style="list-style-type: none"> • Stopped strangers entering • Daily services to pray for forgiveness • Cleaned the streets • Lit candles for God • Fasted to repent sins • Doors and windows sealed • Pilgrimages to show remorse • Sweet smelling herbs • Kept air moving using birds/bells • Ban on God-insulting activities • Flagellants whipped themselves • Butchers punished for mess 	
Treatments: <ul style="list-style-type: none"> • Prayed for people to recover • Holy charms around neck • Cut open buboes to let out pus • Leeches to bleed patient • Used Theory of Opposites – Black Death was a fever so they used cold baths and avoid hot (strong food) such as garlic and onions 	

Public health in towns

Problems	Improvements
<ul style="list-style-type: none"> ✗ Water was collected from a river or pit ✗ Cesspits for human waste were sometimes near water supplies ✗ People threw rubbish into streets and rivers ✗ Animals roamed the streets and left excrement ✗ Diseases were common ✗ Open sewers ran through streets 	<ul style="list-style-type: none"> ✓ Carts collected human waste from cesspits ✓ In Exeter, aqueducts were built ✓ In Newcastle, streets were paved to be easier to clean ✓ Cesspits were lined with brick or stone, so they didn't leak ✓ Laws were passed to punish people for throwing human or butchers' waste into streets

Short-term impact:	Long-term impact:
Killed over 1/3 of the population of medieval England in a year. Whole villages were wiped out, and the loss of many workers led to food shortages. The price of food increased.	Survivors became better off. There was a shortage of workers, so employers had to pay higher wages to attract them. People had more money, and some spent this on education. More people learned to read and write, which helped to spread new ideas more quickly.

Health and the People c1000 to Present Day

Part 2: The beginnings of change c1500-1800

Significance of Vesalius:

Vesalius challenged the work of Galen on anatomy. His work spread due to a printing revolution, the use of artists to produce detailed anatomical drawings, and the growing acceptance that Galen loved enquiry and that doctors should too.

Short-term significance	Long-term significance
<ul style="list-style-type: none"> Improved knowledge of anatomy Changed attitudes – doctors realised there was more to learn Some doctors now carried out human dissection to learn more More anatomic research – e.g. book on human skull and ear 	<ul style="list-style-type: none"> Gradually, people challenged traditional ideas Paved the way for Pare and Harvey Insistence on enquiry – by the late 1600s most students were encouraged to find things out for themselves

Significance of Pare:

Pare developed new types of artificial limbs, a new lotion for gunshot wounds, and ligatures to tie off arteries instead of cauterising wounds. His ligatures caused infection though, and so they were not routinely used for 300 years.

Short-term significance	Long-term significance
<ul style="list-style-type: none"> Lotion instead of oil was widely accepted. Wrote books Showed that new methods could be more successful than old ideas 	<ul style="list-style-type: none"> Encouraged surgeons to think for themselves and try new ideas William Clowes wrote a book detailing battlefield treatments Raised the status of surgeons – Henry VIII set up the Company of Barber Surgeons

Significance of Harvey:

Harvey proved that blood circulated, disproving Galen's theory that blood was produced in the liver and burnt by the body as energy. He was very thorough and used a scientific method and observation before publishing his results.

Short-term significance	Long-term significance
<ul style="list-style-type: none"> Initially many ignored him Almost 50 years until his ideas were taught at University Fewer patients went to Harvey for treatment 	<ul style="list-style-type: none"> Accepted over time. Many future surgical advancements depended on circulation Left gaps in his work – e.g. the work of the liver Malphigi later discovered capillaries Fuelled a scientific revolution – 1660 the Royal Society was established to discuss ideas

Key individuals:

Name	Description
Andreas Vesalius	Fabric of the Human Body , published in 1543. Identified 300 mistakes in Galen's work, such as the lower jaw was in 1 part not two, and the human breastbone was in 3 parts, not 7. Carried out dissections on executed criminals.
William Harvey	De Moto Cordis , published in 1628. He discovered that blood circulates around the body, with the heart acting as a pump. He identified valves in veins to show it was a one-way system.
Ambroise Pare	Battlefield surgeon, who created over 50 types of artificial limb, developed a lotion of egg yolk, oil of roses and turpentine to deal with gunshot wounds (instead of boiling oil), and ligatures (silk threads) to tie off arteries instead of cauterisation.
John Hunter	Trained hundreds of surgeons, including Edward Jenner. Tested new surgical techniques such as tying off an aneurysm instead of amputating the limb. Opened a teaching museum to promote surgery.
Edward Jenner	Discovered that a small dose of cowpox would prevent against smallpox. Became known as vaccination and challenged the traditional practice of inoculation.
James Morrison	A famous Quack, who made his fortune selling 'Vegetable Pills', which he claimed could cure everything. Contained purgatives and many died from excessive bowel movements.

Treating illness in the Renaissance:

- Bleeding:** Still one of the most common treatments
- Herbal remedies:** Printing meant more people could buy 'herbals' such as The Complete Herbal by Nicholas Culpepper
- New treatments from abroad:** Rhubarb to purge the bowels, quinine to treat fevers, opium as an anaesthetic and tobacco was a 'cure-all'
- Quackery:** Travelling salesmen who sold pills and medicine with no training. This boomed in the Renaissance, with men like Joshua Ward (selling pills he claimed could cure any illness, which just made people sweat a lot) and James Morrison making a fortune.
- Superstitious treatments:** Still very popular, such as the touch of a King (92,000 people visited Charles II between 1660-2) to cure scrofula (a skin disease), and the Bezoar Stone from the stomach of a goat to cure all poisons. This was disproven by Pare.

The Great Plague (1665)

Explanations: <ul style="list-style-type: none"> God's punishment – plague was punishment for sin Miasma – bad air was spreading disease Astrology – the planet had moved into a new constellation of stars 	
Prevention: <ul style="list-style-type: none"> People shut in their homes Dead were inspected to check for the plague Bedding hung in smoke Sweep the street outside front door Pigs, dogs and cats banned in cities Large assemblies banned Measures didn't work because: <ul style="list-style-type: none"> They were orders not laws King and council left London Symptoms were not recorded Too few watchmen to enforce 	
Treatments: <ul style="list-style-type: none"> Prayed for people to recover Holy charms around neck Cut open buboes to let out pus Leeches to bleed patient Quacks sold 'Great Medicines' – e.g. London Treacle containing wine, herbs, spices, honey and opium Many herbal remedies were used 	
Short-term impact: <p>Some of the methods introduced in London worked a little, but over 1/4 of the population of London died of the Plague in 1665. A combination of cold weather and the Great Fire of London ended the plague.</p>	Long-term impact: <p>Following the Great Fire, central London was rebuilt, with stone and brick buildings and wider paved streets. For a time, London was healthier. But as the city became more and more crowded in the Industrial Revolution, the benefits disappeared.</p>

Renaissance hospitals:

- Organisation:** Charities and some local councils set up and ran hospitals. More hospitals were established, including specialist ones like maternity hospitals.
- Staffing:** Nursing sisters treated patients with herbal remedies, but nursing helpers did the heavy manual work and had no medical training.
- Patients:** Treated minor complaints like leg ulcers. Infectious diseases were still not admitted. Anyone with money preferred to be treated at home by a physician.
- Treatments:** Herbal remedies, food, rest, and bathing. Provided with warmth and prayer. Treatments were also still based on the Four Humours.
- Scale:** By 1700, London had a population of over half a million, but only had 2 large hospitals. By the 1660s, St Bartholomew's Hospital in London had 2 wards for 300 patients, with 3 physicians and 3 surgeons.

Training and status of surgeons and physicians:

- Throughout the 1500s and 1600s, most physicians still accepted Hippocrates' Theory of the Four Humours. Training was still based on the work of Galen and Arab doctors such as Ibn Sina. But, by the late 1600s, things began to change:
 - In some hospitals, training took place on the ward. More dissections
 - Training emphasised the importance of a scientific approach
 - Better microscopes and the first thermometers helped improve treatment
- Many people still could not afford treatment from a physician. Many preferred the cheaper remedies from surgeons and apothecaries.
- In 1645, The Society was formed to discuss new scientific ideas and publish books and articles. It became The Royal Society in 1662, and Charles II paid for a laboratory and had an observatory built on one of his palaces

Significance of Hunter:

Hunter trained hundreds of new surgeons, developed new surgical methods and opened an anatomical museum in London.

Short-term significance	Long-term significance
<ul style="list-style-type: none"> Encouraged a scientific approach Wrote books on many topics Surgeon to the King and Army and so influenced surgery Set up a teaching museum 	<ul style="list-style-type: none"> Trained hundreds of surgeons Inspired Edward Jenner Company of Surgeons formed in 1745, became Royal College of Surgeons in 1800

Significance of Jenner:

Jenner developed a new vaccine for smallpox, replacing the traditional inoculation. He published his work in 1798.

Short-term significance	Long-term significance
<ul style="list-style-type: none"> 23 experiments before publishing Govt. gave him £30,000 Vaccination became widely used Deaths fell Vaccination compulsory in 1852 	<ul style="list-style-type: none"> Smallpox eradicated as killer disease Enforcement of vaccine in 1872 Wiped out smallpox by 1970s Other vaccines developed One off discovery

Opposition to vaccination:

People didn't like treatment linked to animals, thought disease was God's punishment, Jenner wasn't a famous doctor, he couldn't explain it and inoculators were worried about losing their income.

Health and the People c1000 to Present Day

Part 3: A revolution in medicine c1800-1900

Significance of Pasteur:

In 1861 Pasteur published his Germ Theory which proved that bacteria caused matter to decay and that these bacteria led to disease. Once he proved this, it meant that **miasma** and **spontaneous generation** were no longer believed.

Short-term significance	Long-term significance
<ul style="list-style-type: none"> Robert Koch was the first person to link an individual bacterium to an individual disease (anthrax) Once specific bacteria had been linked to diseases, vaccines were developed to prevent them Joseph Lister used carbolic spray to perform the first antiseptic surgery 	<ul style="list-style-type: none"> In the late 1800s, scientists developed the first chemical drugs (e.g. sulphonamides) and, in the 1930s, the first antibiotic (e.g. penicillin) that killed bacteria in the body was discovered Aseptic surgery developed in the late 19th Century, which aimed to make sure operating theatres were germ-free Pasteur's discovery encouraged councils and governments to build sewers, to keep streets clean, and provide clean water

Factors that enabled Germ Theory

- Individuals:** Pasteur's determination and experiments
- Chance:** Pasteur was able to develop his ideas
- Science and Technology:** Pasteur benefitted from improved microscopes
- Government:** The French government funded Pasteur's laboratories/research team

Significance of Koch:

Koch, a German, was interested in Pasteur's work and a rivalry developed. Koch built on Pasteur's ideas and was able to link a specific bacteria to a specific disease.

Short-term significance

- Investigated anthrax, an animal disease, and discovered the specific bacterium that caused it. This was the first time this had been done and proved Pasteur's Germ Theory
- Developed a method of staining bacteria to make them easier to see. They were then photographed with high-quality lenses
- Pasteur used Koch's findings to develop a vaccine against Anthrax, so Koch got ahead by finding the germs that caused a human disease: tuberculosis (TB). He stained the bacteria so that it could be seen and followed up by doing the same thing for cholera. Other scientists were again influenced and by 1900 other teams had found the bacteria causing typhoid, pneumonia, plague, meningitis, and dysentery

Key individuals:

Name	Description
Louis Pasteur	Published his Germ Theory in 1861 which said that bacteria caused disease. Developed a vaccine for chicken cholera and rabies as well as an anthrax vaccine
Robert Koch	Rival of Pasteur; first to link specific bacteria to specific diseases and stained bacteria to photograph them. Found the specific germ for tuberculosis (TB)
Paul Ehrlich	Developed first magic bullet, Salvarsan 606 (1909)
James Simpson	Identified and popularised the use of chloroform as an effective anaesthetic for surgery and childbirth (1847)
Joseph Lister	Used carbolic spray to reduce infection in surgery (1864)
Edwin Chadwick	Produced a 'Report on the Sanitary Conditions of the Labouring Population' (1842) which argued for better public health
John Snow	Identified the link between cholera and dirty water in 1854
Octavia Hill	Influenced Artisans' and Labourers' Dwellings Improvements Act
Joseph Bazalgette	Organised and designed the sewer system for London which was mostly complete by 1865

Factors that helped Robert Koch

- War:** Franco-Prussian war drove Koch and Pasteur to want national glory – government provided funding to help
- Individuals:** Took forward Pasteur's theory and used similar methods to him
- Science and Technology:** Benefitted from better microscopes & high-quality lenses
- Communication:** Other scientists read about Koch and Pasteur's work and joined the hunt for microbes

Magic Bullets
In 1909, Ehrlich developed the first chemical cure for disease. Salvarsan 606 targeted **only** syphilis bacteria. Scientists then made more sulphonamide drugs

Home Remedies
Until 1900 the most common form of treatment was still home remedies. There was still a lot in common with medieval treatments – e.g. inhaling the breath of cows to treat TB

Patent Medicines
Also known as 'cure-alls', e.g. Holloway's ointment. There was no control over manufacturing standards and the ingredients often killed people instead

Significance of Simpson:

Discovered the possible use of chloroform as an anaesthetic in 1847, which was faster, better, and safer than ether. There was opposition as it was new and untested, some believed that pain was natural and came from God, and it increased infection as surgeons got more confident and carried infection deeper into the body. This opposition was overcome when Queen Victoria used it in 1853.

Short-term significance	Long-term significance
<ul style="list-style-type: none"> Allowed more complex operations Surgeons could work more slowly and carefully However, it increased the risk of infection 	<ul style="list-style-type: none"> Encouraged others to search for even better anaesthetics Other chemicals were used to relax muscles Local anaesthetics were developed to numb pain in a certain area of the body In the 1930s, a method of injecting anaesthetics was developed, which made it easier to control dosage

Significance of Lister:

Lister had read Pasteur's work and wanted to reduce germs in surgery. In 1864 he noticed that carbolic acid was used to reduce the smell of sewage and applied it to bandages wrapped around wounds: they healed and did not get infected. There was some opposition as carbolic acid soaked the operating theatres, hurt the surgeons' skin and slowed down operations, but Lister demonstrated his techniques to over 1500 medical students that he was training and by the end of the century his ideas had become widely accepted.

Short-term significance	Long-term significance
<ul style="list-style-type: none"> The death rate fell by 30% in Lister's operations, and he published his results He worked to improve his method so bacteria was killed at every stage – washing hands with carbolic acid, using carbolic spray to kill germs around the operating table, and using antiseptic ligatures to tie up blood vessels 	<ul style="list-style-type: none"> Lister's methods were called antiseptic surgery. By the late 1890s, this had developed into aseptic surgery – which meant removing all possible germs from the operating theatre. This meant operating theatres and hospitals were cleaned, instruments were steam-sterilised, surgeons wore surgical gowns and face masks and sterilised rubber gloves were introduced Surgery became more ambitious. The first successful operation to remove an infected appendix came in the 1880s. Surgery on the small intestine, to stop the spread of cancer, also started at this time. The first heart operation was carried out in 1896, when surgeons repaired a heart damaged by a stab wound

Public health in Industrial Britain

- **Conditions were generally poor**
 - ✓ Badly ventilated houses with families crammed together and sharing toilets
 - ✓ 12-hour working days in hot, dirty, dangerous workshops
 - ✓ Fresh food was expensive and hard to get
 - ✓ Doctors charged fees, so most people could not afford them
 - ✓ It was difficult to get fresh, clean drinking water
 - ✓ Low life expectancy for working class people
 - ✓ Cholera was a huge problem: due to dirty water, there were frequent outbreaks between 1831 and 1865 and killed over 54,000 people
 - ✓ Dumping rubbish, dead animals, chemicals, and human waste in the rivers led to the Great Stink of 1858 in London, when a thick layer of sewage sat on top of the Thames in a hot summer. It made the smell unbearable for MPs and encouraged them to hire Bazalgette to design London's sewers

Significance of Chadwick:

In 1842, Chadwick compiled a report into the working conditions of the working population and identified that overcrowding and poor conditions led to illness: he said that taxes needed to be raised to help the poor. His solution was for the government to reform public health

- Chadwick's work led to the Public Health Act of 1848: it wasn't compulsory but it set up the National Board of Health and encouraged local councils to make improvements by collecting taxes if they had the support to do so
- Many people were opposed to Chadwick's findings as they did not want to pay more taxes to fund the improvements and did not want government interference in local matters (as per the government's laissez-faire attitude)

Significance of Snow:

In 1854, Snow used the Broad Street pump and the deaths around it to suggest a link between dirty water and disease – however, he could not prove the link as Germ Theory would not be published until 1861

- Snow removed the handle from the Broad Street water pumps and deaths in the area from cholera stopped. He had proved that clean water was essential for preventing the spread of cholera but as there was no scientific proof (i.e. Germ Theory) and people still believed in miasma, the government did not act. This was due to wealthy people not wanting to pay more tax and a belief in laissez-faire government – that the government should not interfere in people's lives
- By 1875 pressure on the government had built and the second Public Health Act forced councils to make improvements in sewerage and proper drainage as well as appointing a Medical Officer of Health in every area

Alexander Fleming: Penicillin

Background
During the First World War, Alexander Fleming was sent to France to study soldiers' wounds. He found that wounds infected with bacteria were not healed by chemical antiseptics. Many soldiers were dying from their infected wounds.

<p>Breakthrough In 1929, Fleming was working at St Mary's Hospital in London. While he went on holiday, he left a pile of petri dishes containing bacteria on his laboratory bench. On his return, he sorted out the dishes and noticed mould on one of them. Around the mould, the bacteria had disappeared. He looked through his microscope and could see that the areas where the bacteria had died were covered with a mould called penicillin.</p>	<p>Limitations In 1929, he published his research in a medical journal, but nobody thought his article was important. Fleming discussed penicillin's potential as an antiseptic, but he made no great claims for its role as a general antibiotic. Fleming had not used penicillin to heal major illnesses, nor done systematic tests on animals. It went largely unnoticed... for now.</p>
---	--

<p>Short Term Impact:</p> <ul style="list-style-type: none"> • Development of penicillin – the first effective antibiotic • In the 1930s, Howard Florey and Ernst Chain develop Fleming's idea into a medical treatment • Penicillin becomes the first antibiotic • Penicillin is used in the Second World War to treat Allied soldiers 	<p>Long Term Impact:</p> <ul style="list-style-type: none"> • Penicillin and other antibiotics are mass produced by the pharmaceutical industry • In Britain, after the Second World War, the government provides antibiotics free to anyone who needs them through the National Health Service (NHS) • The impact of antibiotics in modern medicine has been far reaching. It is no exaggeration to say that they have saved millions of lives
--	---

Developments in the Pharmaceutical Industry and other Treatments

<p>Positives</p> <ul style="list-style-type: none"> • Development of aspirin in 1970s - thins the blood and can help reduce risk of heart attacks • In 1953, Francis Crick and James Watson discovered the structure of human DNA and how it passes from parents to their children. In the 1990s, the Human Genome Project began working out exactly how each part of human DNA affects the body. This information has allowed scientists to find ways of treating specific genetic illnesses. • A range of 'alternative' treatments 	<p>Negatives</p> <ul style="list-style-type: none"> • Thalidomide- in the 1950s, thalidomide was introduced as a 'safe' sleeping tablet. It was later given to women to reduce morning sickness in pregnancy. However, the drug had not been fully tested and led to children being born with severely deformed limbs. • Antibiotic resistance- some bacteria began developing immunity to antibiotics. These 'superbugs', such as MRSA, can resist science's efforts to kill it, either with antiseptics or antibiotics.. Overuse of antibiotics has made them less effective.
--	--

Key individuals:

Alexander Fleming	Discovered the first antibiotic penicillin in 1929. At the time he discussed penicillin as an antiseptic but made no claim of it being an antibiotic.
Florey and Chain	In the 1930s, Howard Florey and Ernst Chain develop Fleming's idea into a medical treatment. Penicillin becomes the first antibiotic. Penicillin is used in the Second World War to treat Allied soldiers when they mass produce it using funds from the American government.
William Rontgen	A German scientist, in 1895 he found that X-Rays could pass through paper, wood, and flesh – but not bone. Within months, the first X-Ray machines were being used in hospitals to identify diseases and broken bones. X rays were first heavily used in the First World War.
Karl Landsteiner	Discovered blood groups in 1901 – that blood of one group cannot be mixed with blood of another group. After this, blood transfusions became possible, as long as the patient and the donor were of the same blood group and in the same place.
Harold Gillies	Plastic surgery developed quickly during WWI. Harold Gillies pioneered major improvements in the use of skin grafts, taking skin from another part of the body and grafting it on to the area of the wound. He persuaded the army's chief surgeon that a specialist facial injury care unit was needed in England for the wounded, and the Queens Hospital was opened in Kent in 1917.
Archibald McIndoe	In WWII, advancements in weaponry meant that burns were common. Archibald McIndoe carried out 4000 operations on burns. He used grafts to reconstruct airmen's faces and hands. Her also helped patients psychologically deal with changes in appearance.
David Lloyd George	He was Chancellor of the Exchequer (responsible for government money) in the Liberal government of 1906. He increased the taxes paid by the rich to pay for the reforms such as the National Insurance Act and Old Age Pensions.
William Beveridge	In 1941, the national coalition government asked William Beveridge to write a report on what should be done to improve people's lives after the WWII. In his report, he set out measures to slay the five giants of 'squalor (poor housing), ignorance (bad education), want (poverty), idleness (unemployment) and disease (ill-health)'. He suggested a 'cradle to the grave' welfare state.
Aneurin Bevan	In 1946, Bevan (Labour Health Minister) introduced his plans for a National Health Service to Parliament. In July 1948, the NHS was introduced, providing free medical services for everyone.

The **biggest problem facing the people in Britain** is not infectious or genetic diseases but **lifestyle choices**: mental health problems caused by stress and lack of sleep, breathing difficulties caused by breathing polluted air, obesity caused by high fat and high sugar diet with little exercise

Health and the People c1000 to Present Day

Part 4: The twentieth century c1900-today

Problem	How WWI and WWII Helped SURGERY
Foreign Bodies- difficult to locate shrapnel	X-Rays: In 1895, German scientist, Wilhelm Rontgen, found that X-Rays could pass through paper, wood, and flesh – but not bone. Within months, the first X-Ray machines were being used in hospitals to identify diseases and broken bones. However, it was the First World War that saw this technology being widely used. Many casualties had bullets or shrapnel embedded deep in their body. X-Rays helped surgeons find these objects quickly and remove them more easily and completely.
Deep infections-	Improved antiseptic techniques: Surgeons experimented with new ways to prevent infection in wounds. For example, two doctors devised a system of tubes (called the Carrel-Dakin method) which kept a chemical solution continually flowing through the wound to fight infection. Continuous use was more effective than a one-off treatment. As a result, fewer amputations led to infection.
Blood loss – many men died from blood loss	Blood transfusions and blood banks: 1901, Karl Landsteiner discovered blood groups – that blood of one group cannot be mixed with blood of another group. After this, blood transfusions became possible, as long as the patient and the donor were of the same blood group and in the same place. When doctors tried to store or transport blood, it clotted and could not be used. In WWI sodium citrate was added to prevent the blood from clotting. Later in the war, scientists discovered how to separate and store the blood cells from the plasma and keep them in a 'blood bank' for future use.
Disfiguring injuries could be caused by bullets or shell damage	Plastic surgery: First World War: Surgeons carried out over 11,000 plastic surgery operations, increasing their experience and learning from one another. By Nov1915, 7 hospitals in France had specialist plastic surgery departments. Surgeons developed new techniques using jaw splints, wiring, and metal plates as 'replacement' cheeks. Another major improvement was the use of skin grafts, taking skin from another part of the body and grafting it on to the area of the wound. Harold Gillies started a specialist facial injury care unit- the Queens Hospital was opened in Kent in 1917 Second World War: Advancements in weaponry meant that burns were common, and plastic surgeons became expert in repairing burn damage. Archibald McIndoe carried out 4000 operations on burns. He used grafts to reconstruct faces and hands.

The Liberal Reforms- 1906-1914- WHO influenced them and what were they?		
Seebohm Rowntree- 1901 -published a study in York, showing more than a quarter of people were living in poverty, seriously affecting their health.	Charles Booth paid for research into poverty in London between 1889 and 1903. Discovered 35% of people lived in poverty. Argued that the gov should take responsibility- suggested an old-age pension.	David Lloyd-George Persuasive speaker, determined to improve lives of ordinary people. A friend of Rowntree. He was Chancellor of the Exchequer in the Liberal gov. He increased the taxes to pay for Lib Reforms

- 1906** Free school meals for children
- 1907** All births had to be recorded. A health visitor then made checks to make sure the mother knew how to look after the baby. Free medical checks for school children
- 1908** Old-age pensions introduced for over-70s
- 1909** New laws enforce higher standards of house building
- 1911** National Insurance Act gave workers medical help and sick pay if they could not work due to illness.
- 1912** Clinics set up to provide free medical treatment for children in school

Impact of both World Wars on Public Health, housing and poverty		
'Homes fit for heroes' Immediately after WWI, the gov introduced the 1919 Housing Act. This forced local councils to provide good homes for working people to rent. 250,000 new homes were built in the early 1920s.	The 'Hungry Thirties' 1930s, Britain suffered an economic depression. Unemployment rose to more than 3 million, causing huge poverty. Only about half of the population was covered by National Insurance. The NI Scheme did not help the unemployed.	Impact of WWII Evacuation opened people's eyes to poverty. The Beveridge Report (see Beveridge) called for an NHS and universal national insurance. The Labour Party promised to establish a NHS. They won a landslide victory.

Modern Improvements in Surgery						
Injected anaesthetics 1930s Helmuth Wesse injected them into bloodstream - more accurate dosage	Radiation and chemotherapy Radium discovered by Marie Curie. 1970s chemo used chemicals to attack cancer	Open Heart Surgery Heart/lung machine bypassed heart and maintain blood circulation while surgery is carried out.	Transplant Surgery The first heart transplant was carried out in South Africa in 1967.	Keyhole Surgery allowed surgeons to work through a tiny hole to carry out complex operations.	Robotic Surgery Nanobots (tiny specialised robots less than a mm long) can perform tasks such as clearing arteries.	Scanning Machines CT, MRI and Ultrasound

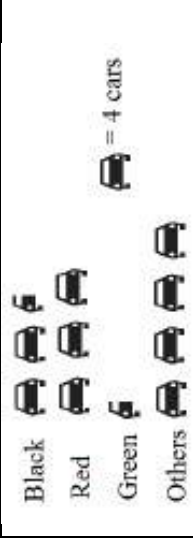
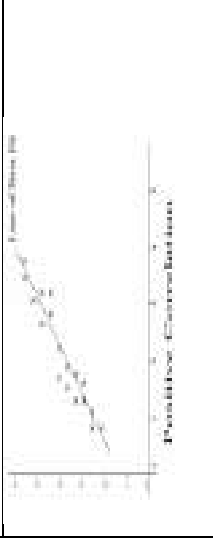
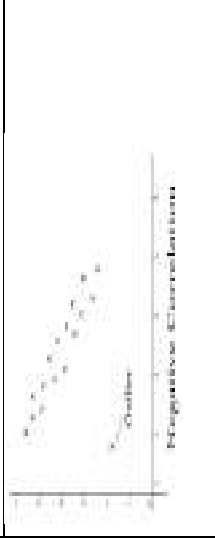

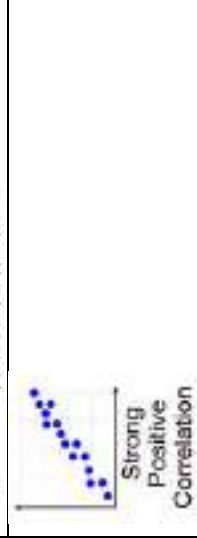
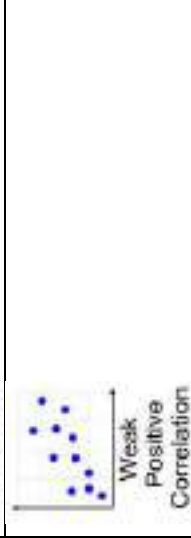
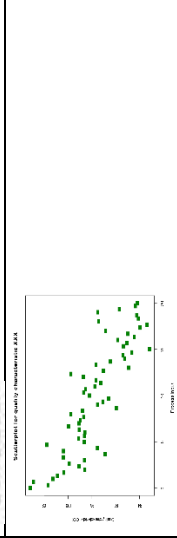

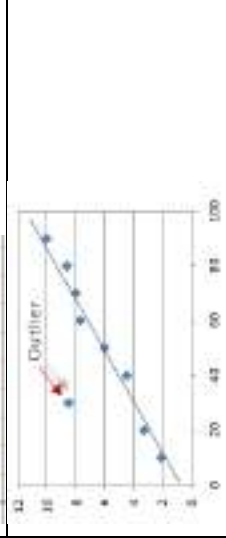
The NHS- In July 1948, it was introduced by Labour, providing free medical services for everyone.		
- Many hospitals were rebuilt and facilities were improved. - Health centres set up -NHS hospitals provided maternity care, child welfare and ambulances - GPs, provided care and advice for people in the community. -Free dentistry, spectacles and medicines - Vaccination programme	Opposition: • Doctors feared they would lose their freedom to treat private patients who paid fees. Bevan agreed doctors could continue to treat patients privately as well as working for the NHS • Some people believed that the poor should not be helped. They thought that the poor would grow lazy • Some local councils and charities did not want the gov taking over control of their hospitals	Long Term Impact: 1. Babies are less likely to die – Infant mortality has improved dramatically. 2. Immunisation campaigns have eradicated some illnesses 3. People live longer – People now live 13 years longer than they did in 1948. Better access to healthcare has played significant role. 4. However, the NHS is now struggling to cope.



Topic/Skill	Definition/Tips	Example																					
1. Frequency Table	A record of how often each value in a set of data occurs .	<table border="1"> <thead> <tr> <th>Number of marks</th> <th>Tally marks</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td>1</td> <td> </td> <td>7</td> </tr> <tr> <td>2</td> <td> </td> <td>5</td> </tr> <tr> <td>3</td> <td> </td> <td>6</td> </tr> <tr> <td>4</td> <td> </td> <td>5</td> </tr> <tr> <td>5</td> <td> </td> <td>3</td> </tr> <tr> <td>Total</td> <td></td> <td>26</td> </tr> </tbody> </table>	Number of marks	Tally marks	Frequency	1		7	2		5	3		6	4		5	5		3	Total		26
Number of marks	Tally marks	Frequency																					
1		7																					
2		5																					
3		6																					
4		5																					
5		3																					
Total		26																					
2. Bar Chart	Represents data as vertical blocks. x – axis shows the type of data y – axis shows the frequency for each type of data Each bar should be the same width There should be gaps between each bar Remember to label each axis.																						
3. Types of Bar Chart	Compound/Composite Bar Charts show data stacked on top of each other. Comparative/Dual Bar Charts show data side by side.																						
4. Pie Chart	Used for showing how data breaks down into its constituent parts. When drawing a pie chart, divide 360° by the total frequency . This will tell you how many degrees to use for the frequency of each category. Remember to label the category that each sector in the pie chart represents.	<p>If there are 40 people in a survey, then each person will be worth $360 \div 40 = 9^\circ$ of the pie chart.</p>																					



Block G

5. Pictogram	<p>Uses pictures or symbols to show the value of the data.</p> <p>A pictogram must have a key.</p>	
6. Correlation	Correlation between two sets of data means they are connected in some way.	There is correlation between temperature and the number of ice creams sold.
7. Positive Correlation	As one value increases the other value increases .	
8. Negative Correlation	As one value increases the other value decreases .	
9. No Correlation	There is no linear relationship between the two.	
10. Strong Correlation	When two sets of data are closely linked .	
11. Weak Correlation	When two sets of data have correlation, but are not closely linked .	
12. Scatter Graph	A graph in which values of two variables are plotted along two axes to compare them and see if there is any connection between them.	
13. Line of Best Fit	A straight line that best represents the data on a scatter graph.	
14. Outlier	A value that 'lies outside' most of the other values in a set of data. An outlier is much smaller or much larger than the other values in a set of data.	

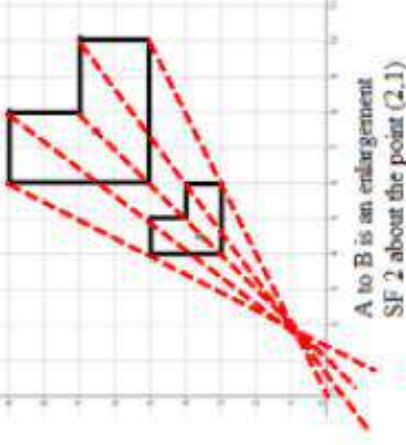


Block G

<p>15. Translation</p>	<p>Translate means to move a shape. The shape does not change size or orientation.</p>	
<p>16. Column Vector</p>	<p>In a column vector, the top number moves left (-) or right (+) and the bottom number moves up (+) or down (-)</p>	<p>$\begin{pmatrix} 2 \\ 3 \end{pmatrix}$ means '2 right, 3 up' $\begin{pmatrix} -1 \\ -5 \end{pmatrix}$ means '1 left, 5 down'</p>
<p>17. Rotation</p>	<p>The size does not change, but the shape is turned around a point. Use tracing paper.</p>	<p>Rotate Shape A 90° anti-clockwise about (0,1)</p>
<p>18. Reflection</p>	<p>The size does not change, but the shape is 'flipped' like in a mirror. Line $x = ?$ is a vertical line. Line $y = ?$ is a horizontal line. Line $y = x$ is a diagonal line.</p>	<p>Reflect shape C in the line $y = x$</p>
<p>18. Enlargement</p>	<p>The shape will get bigger or smaller. Multiply each side by the scale factor.</p>	<p>Scale Factor = 3 means '3 times larger = multiply by 3' Scale Factor = $\frac{1}{2}$ means 'half the size = divide by 2'</p>

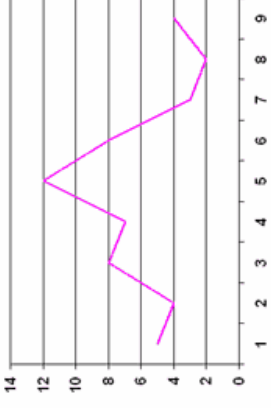
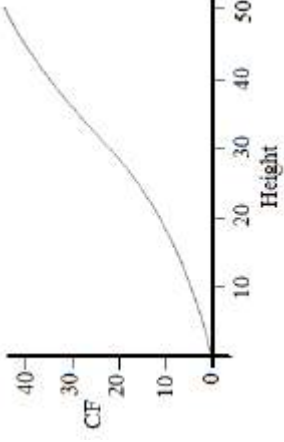
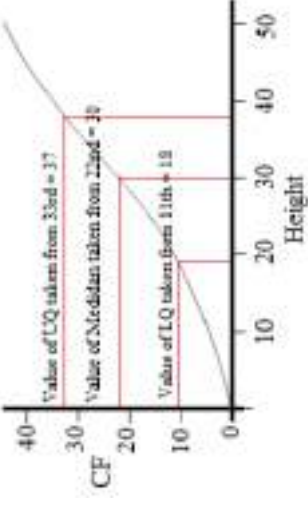



Block G

<p>20. Finding the Centre of Enlargement</p>	<p>Draw straight lines through corresponding corners of the two shapes. The centre of enlargement is the point where all the lines cross over.</p> <p>Be careful with negative enlargements as the corresponding corners will be the other way around.</p>	 <p>A to B is an enlargement SF 2 about the point (2,1)</p>
<p>21. Describing Transformations</p>	<p>Give the following information when describing each transformation:</p> <p>Look at the number of marks in the question for a hint of how many pieces of information are needed.</p> <p>If you are asked to describe a 'transformation', you need to say the name of the type of transformation as well as the other details.</p>	<ul style="list-style-type: none"> - Translation, Vector - Rotation, Direction, Angle, Centre - Reflection, Equation of mirror line - Enlargement, Scale factor, Centre of enlargement



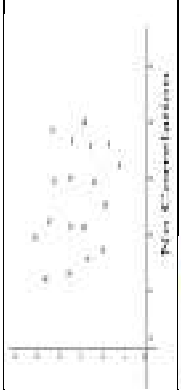
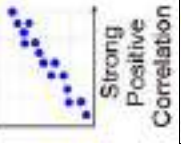
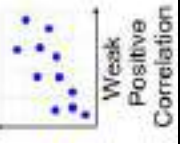
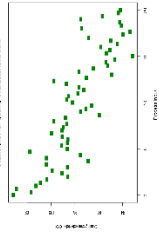
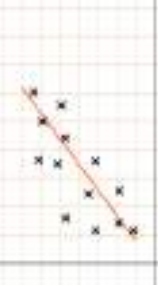


Block G

Topic/Skill	Definition/Tips	Example												
1. Line Graph	<p>A graph that uses points connected by straight lines to show how data changes in values.</p> <p>This can be used for time series data, which is a series of data points spaced over uniform time intervals in time order.</p>													
2. Cumulative Frequency	<p>Cumulative Frequency is a running total.</p> <table border="1"> <thead> <tr> <th>Age</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td>$0 < a \leq 10$</td> <td>15</td> </tr> <tr> <td>$10 < a \leq 40$</td> <td>35</td> </tr> <tr> <td>$40 < a \leq 50$</td> <td>10</td> </tr> </tbody> </table>	Age	Frequency	$0 < a \leq 10$	15	$10 < a \leq 40$	35	$40 < a \leq 50$	10	<table border="1"> <thead> <tr> <th>Cumulative Frequency</th> </tr> </thead> <tbody> <tr> <td>15</td> </tr> <tr> <td>$15 + 35 = 50$</td> </tr> <tr> <td>$50 + 10 = 60$</td> </tr> </tbody> </table>	Cumulative Frequency	15	$15 + 35 = 50$	$50 + 10 = 60$
Age	Frequency													
$0 < a \leq 10$	15													
$10 < a \leq 40$	35													
$40 < a \leq 50$	10													
Cumulative Frequency														
15														
$15 + 35 = 50$														
$50 + 10 = 60$														
3. Cumulative Frequency Diagram	<p>A cumulative frequency diagram is a curve that goes up. It looks a little like a stretched-out S shape.</p> <p>Plot the cumulative frequencies at the end-point of each interval.</p>													
4. Quartiles from Cumulative Frequency Diagram	<p>Lower Quartile (Q1): 25% of the data is less than the lower quartile. Median (Q2): 50% of the data is less than the median. Upper Quartile (Q3): 75% of the data is less than the upper quartile. Interquartile Range (IQR): represents the middle 50% of the data.</p>	 <p style="text-align: center;">$IQR = 37 - 18 = 19$</p>												
5. Box Plots	<p>The minimum, lower quartile, median, upper quartile and maximum are shown on a box plot.</p> <p>A box plot can be drawn independently or from a cumulative frequency diagram.</p>	<p>Students sit a maths test. The highest score is 19, the lowest score is 8, the median is 14, the lower quartile is 10 and the upper quartile is 17. Draw a box plot to represent this information.</p> 												
6. Comparing Box Plots	<p>Write two sentences.</p> <ol style="list-style-type: none"> Compare the averages using the medians for two sets of data. Compare the spread of the data using the range or IQR for two sets of data. 	<p>‘On average, students in class A were more successful on the test than class B because their median score was higher.’</p>												

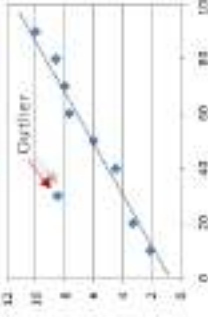
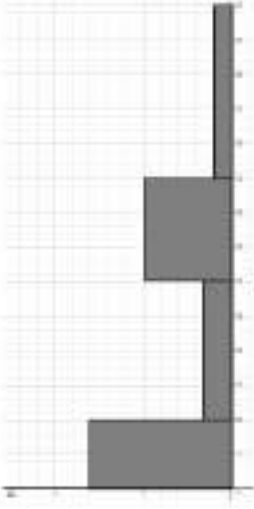



Block G

	<p>The <u>smaller</u> the range/IQR, the <u>more consistent</u> the data.</p> <p>You must compare box plots in the context of the problem.</p>	<p>‘Students in class B were more consistent than class A in their test scores as their IQR was smaller.’</p>
7. Correlation	Correlation between two sets of data means they are connected in some way.	There is correlation between temperature and the number of ice creams sold.
8. Causality	When one variable influences another variable.	The more hours you work at a particular job (paid hourly), the higher your income <u>from that job</u> will be.
9. Positive Correlation	As one value increases the other value increases .	
10. Negative Correlation	As one value increases the other value decreases .	
11. No Correlation	There is no linear relationship between the two.	
12. Strong Correlation	When two sets of data are closely linked .	
13. Weak Correlation	When two sets of data have correlation, but are not closely linked .	
14. Scatter Graph	A graph in which values of two variables are plotted along two axes to compare them and see if there is any connection between them.	
15. Line of Best Fit	A straight line that best represents the data on a scatter graph.	

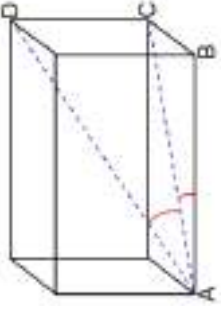

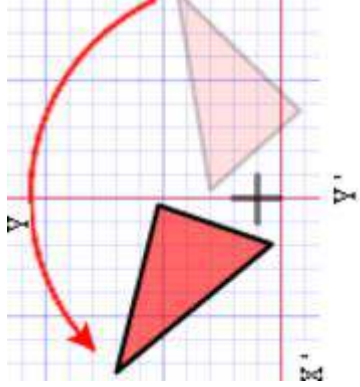
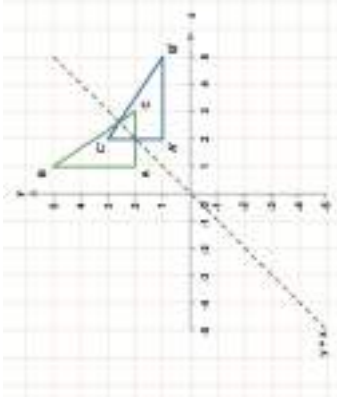


Block G

16. Outlier	<p>A value that 'lies outside' most of the other values in a set of data. An outlier is much smaller or much larger than the other values in a set of data.</p>																
17. Histograms	<p>A visual way to display frequency data using bars.</p> <p>Bars can be unequal in width.</p> <p>Histograms show frequency density on the y-axis, not frequency.</p> $\text{Frequency Density} = \frac{\text{Frequency}}{\text{Class Width}}$ <table border="1"> <thead> <tr> <th>Height(cm)</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td>$0 < h \leq 10$</td> <td>8</td> </tr> <tr> <td>$10 < h \leq 30$</td> <td>6</td> </tr> <tr> <td>$30 < h \leq 45$</td> <td>15</td> </tr> <tr> <td>$45 < h \leq 70$</td> <td>5</td> </tr> </tbody> </table>	Height(cm)	Frequency	$0 < h \leq 10$	8	$10 < h \leq 30$	6	$30 < h \leq 45$	15	$45 < h \leq 70$	5	<table border="1"> <thead> <tr> <th>Frequency Density (FD)</th> </tr> </thead> <tbody> <tr> <td>$8 \div 5 = 1.6$</td> </tr> <tr> <td>$6 \div 20 = 0.3$</td> </tr> <tr> <td>$15 \div 15 = 1$</td> </tr> <tr> <td>$5 \div 25 = 0.2$</td> </tr> </tbody> </table> 	Frequency Density (FD)	$8 \div 5 = 1.6$	$6 \div 20 = 0.3$	$15 \div 15 = 1$	$5 \div 25 = 0.2$
Height(cm)	Frequency																
$0 < h \leq 10$	8																
$10 < h \leq 30$	6																
$30 < h \leq 45$	15																
$45 < h \leq 70$	5																
Frequency Density (FD)																	
$8 \div 5 = 1.6$																	
$6 \div 20 = 0.3$																	
$15 \div 15 = 1$																	
$5 \div 25 = 0.2$																	
18. Interpreting Histograms	<p>The area of the bar is proportional to the frequency of that class interval.</p> $\text{Frequency} = \text{Freq Density} \times \text{Class Width}$	<p>A histogram shows information about the heights of a number of plants. 4 plants were less than 5cm tall. Find the number of plants more than 5cm tall.</p>  <p>Above 5cm: $1.2 \times 10 + 2.4 \times 15 = 12 + 36 = 48$</p>															
19. 3D Pythagoras' Theorem	<p>Find missing lengths by identifying right angled triangles.</p> <p>You will often have to find a missing length you are not asked for before finding the missing length you are asked for.</p>	<p>Can a pencil that is 20cm long fit in a pencil tin with dimensions 12cm, 13cm and 9cm? The pencil tin is in the shape of a cuboid.</p> <p>Hypotenuse of the base = $\sqrt{12^2 + 13^2} = 17.7$</p> <p>Diagonal of cuboid = $\sqrt{17.7^2 + 9^2} = 19.8\text{cm}$</p> <p>No, the pencil cannot fit.</p>															

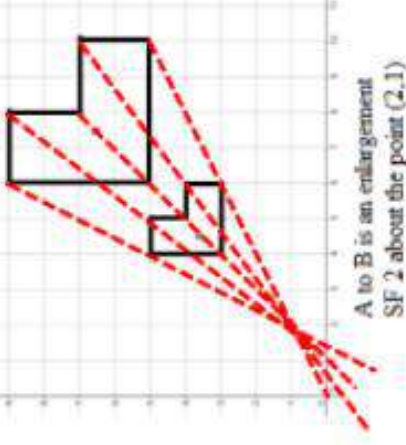
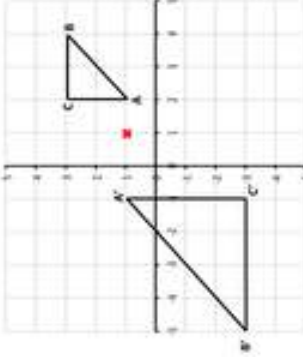
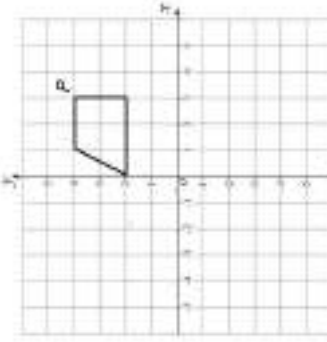


Block G

20. 3D Trigonometry	Find missing lengths by identifying right angled triangles . You will often have to find a missing length you are not asked for before finding the missing length you are asked for.	
21. Translation	Translate means to move a shape . The shape does not change size or orientation .	
22. Column Vector	In a column vector, the top number moves left (-) or right (+) and the bottom number moves up (+) or down (-)	$\begin{pmatrix} 2 \\ 3 \end{pmatrix}$ means '2 right, 3 up' $\begin{pmatrix} -1 \\ -5 \end{pmatrix}$ means '1 left, 5 down'
23. Rotation	The size does not change, but the shape is turned around a point . Use tracing paper.	Rotate Shape A 90° anti-clockwise about (0,1) 
24. Reflection	The size does not change, but the shape is 'flipped' like in a mirror . Line $x = ?$ is a vertical line . Line $y = ?$ is a horizontal line . Line $y = x$ is a diagonal line .	Reflect shape C in the line $y = x$ 
25. Enlargement	The shape will get bigger or smaller . Multiply each side by the scale factor .	Scale Factor = 3 means '3 times larger = multiply by 3' Scale Factor = $\frac{1}{2}$ means 'half the size = divide by 2'



Block G

<p>26. Finding the Centre of Enlargement</p>	<p>Draw straight lines through corresponding corners of the two shapes. The centre of enlargement is the point where all the lines cross over.</p> <p>Be careful with negative enlargements as the corresponding corners will be the other way around.</p>	
<p>27. Describing Transformations</p>	<p>Give the following information when describing each transformation:</p> <p>Look at the number of marks in the question for a hint of how many pieces of information are needed.</p> <p>If you are asked to describe a ‘transformation’, you need to say the name of the type of transformation as well as the other details.</p> <p>Negative enlargements will look like they have been rotated.</p> <p>$SF = -2$ will be rotated, and also twice as big.</p>	<ul style="list-style-type: none"> - Translation, Vector - Rotation, Direction, Angle, Centre - Reflection, Equation of mirror line - Enlargement, Scale factor, Centre of enlargement
<p>28. Negative Scale Factor Enlargements</p>	<p>Negative enlargements will look like they have been rotated.</p> <p>$SF = -2$ will be rotated, and also twice as big.</p>	<p>Enlarge ABC by scale factor -2, centre $(1,1)$</p> 
<p>29. Invariance</p>	<p>A point, line or shape is invariant if it does not change/move when a transformation is performed.</p> <p>An invariant point ‘does not vary’.</p>	<p>If shape P is reflected in the $y - axis$, then exactly one vertex is invariant.</p> 
<p>30. Vector Notation</p>	<p>A vector can be written in 3 ways:</p> <p style="text-align: center;">a or \overrightarrow{AB} or $\begin{pmatrix} 1 \\ 3 \end{pmatrix}$</p>	



Block G


31. Vector	A vector is a quantity represented by an arrow with both direction and magnitude . $\vec{AB} = -\vec{BA}$	
32. Magnitude	Magnitude is defined as the length of a vector.	
33. Equal Vectors	If two vectors have the same magnitude and direction , they are equal.	
34. Parallel Vectors	Parallel vectors are multiples of each other.	<p>$2\mathbf{a} + \mathbf{b}$ and $4\mathbf{a} + 2\mathbf{b}$ are parallel as they are multiple of each other.</p>
35. Collinear Vectors	Collinear vectors are vectors that are on the same line . To show that two vectors are collinear , show that one vector is a multiple of the other (parallel) AND that both vectors share a point .	
36. Resultant Vector	The resultant vector is the vector that results from adding two or more vectors together. The resultant can also be shown by lining up the head of one vector with the tail of the other.	<p>if $\underline{\mathbf{a}} = \begin{pmatrix} 4 \\ 4 \end{pmatrix}$ and $\underline{\mathbf{b}} = \begin{pmatrix} 2 \\ -2 \end{pmatrix}$ then $\underline{\mathbf{a}} + \underline{\mathbf{b}} = \begin{pmatrix} 4 \\ 4 \end{pmatrix} + \begin{pmatrix} 2 \\ -2 \end{pmatrix} = \begin{pmatrix} 6 \\ 2 \end{pmatrix}$</p>



Block G

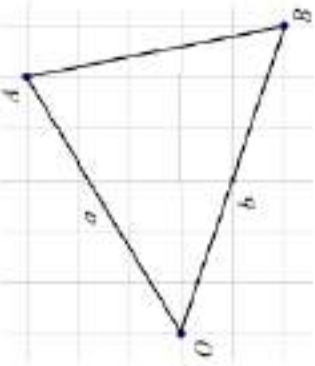
37. Scalar of a Vector

A scalar is the number we multiply a vector by.



Example:
 $3a + 2b =$
 $= 3\begin{pmatrix} 2 \\ 1 \end{pmatrix} + 2\begin{pmatrix} 4 \\ -1 \end{pmatrix}$
 $= \begin{pmatrix} 6 \\ 3 \end{pmatrix} + \begin{pmatrix} 8 \\ -2 \end{pmatrix}$
 $= \begin{pmatrix} 14 \\ 1 \end{pmatrix}$

38. Vector Geometry



$$\begin{aligned} \vec{OA} &= a & \vec{AO} &= -a \\ \vec{OB} &= b & \vec{BO} &= -b \end{aligned}$$

$$\begin{aligned} \vec{AB} &= \vec{AO} + \vec{OB} = -a + b = b - a \\ \vec{BA} &= \vec{BO} + \vec{OA} = -b + a = a - b \end{aligned}$$

Example 1: X is the midpoint of AB . Find \vec{OX}
 Answer: Draw X on the original diagram

Now build up a journey:
 $\vec{OX} = \vec{OA} + \frac{1}{2}\vec{AB}$
 This will give: $\vec{OX} = a + \frac{1}{2}(b - a)$
 This will simplify to $\frac{1}{2}a + \frac{1}{2}b$ or $\frac{1}{2}(a + b)$



Block H

Topic/Skill	Definition/Tips	Example
1. Rounding	<p>To make a number simpler but keep its value close to what it was.</p> <p>If the digit to the right of the rounding digit is less than 5, round down. If the digit to the right of the rounding digit is 5 or more, round up.</p>	<p>74 rounded to the nearest ten is 70, because 74 is closer to 70 than 80.</p> <p>152,879 rounded to the nearest thousand is 153,000.</p>
2. Decimal Place	<p>The position of a digit to the right of a decimal point.</p>	<p>In the number 0.372, the 7 is in the second decimal place.</p> <p>0.372 rounded to two decimal places is 0.37, because the 2 tells us to round down.</p> <p>Careful with money - don't write £27.4, instead write £27.40</p>
3. Significant Figure	<p>The significant figures of a number are the digits which carry meaning (ie. are significant) to the size of the number.</p> <p>The first significant figure of a number cannot be zero.</p> <p>In a number with a decimal, trailing zeros are not significant.</p>	<p>In the number 0.00821, the first significant figure is the 8.</p> <p>In the number 2.740, the 0 is not a significant figure.</p> <p>0.00821 rounded to 2 significant figures is 0.0082.</p> <p>19357 rounded to 3 significant figures is 19400. We need to include the two zeros at the end to keep the digits in the same place value columns.</p>
4. Error Interval	<p>A range of values that a number could have taken before being rounded or truncated.</p> <p>An error interval is written using inequalities, with a lower bound and an upper bound.</p> <p>Note that the lower bound inequality can be 'equal to', but the upper bound cannot be 'equal to'.</p>	<p>0.6 has been rounded to 1 decimal place.</p> <p>The error interval is:</p> $0.55 \leq x < 0.65$ <p>The lower bound is 0.55 The upper bound is 0.65</p>
5. Estimate	<p>To find something close to the correct answer.</p>	<p>An estimate for the height of a man is 1.8 metres.</p>
6. Approximation	<p>When using approximations to estimate the solution to a calculation, round each number in the calculation to 1 significant figure.</p> <p>\approx means 'approximately equal to'</p>	$\frac{348 + 692}{0.526} \approx \frac{300 + 700}{0.5} = 2000$ <p>'Note that dividing by 0.5 is the same as multiplying by 2'</p>



Block H

7. Quadratic Graph	<p>A 'U-shaped' curve called a parabola. The equation is of the form $y = ax^2 + bx + c$, where a, b and c are numbers, $a \neq 0$. If $a < 0$, the parabola is upside down.</p>	
8. Cubic Graph	<p>The equation is of the form $y = ax^3 + k$, where k is an number. If $a > 0$, the curve is increasing. If $a < 0$, the curve is decreasing.</p>	<p>$a > 0$</p> <p>$a < 0$</p>
9. Reciprocal Graph	<p>The equation is of the form $y = \frac{A}{x}$, where A is a number and $x \neq 0$. The graph has asymptotes on the x-axis and y-axis.</p>	
10. Asymptote	<p>A straight line that a graph approaches but never touches.</p>	
11. Roots of a Quadratic	<p>A root is a solution. The roots of a quadratic are the x-intercepts of the quadratic graph.</p>	
12. Turning Point of a Quadratic	<p>A turning point is the point where a quadratic turns. On a positive parabola, the turning point is called a minimum. On a negative parabola, the turning point is called a maximum.</p>	



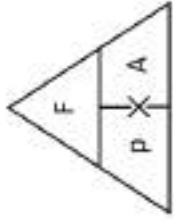
Block H

13. Prism	A prism is a 3D shape whose cross section is the same throughout.	
14. Cross Section	The cross section is the shape that continues all the way through the prism.	
15. Volume of a Prism	$V = \text{Area of Cross Section} \times \text{Length}$ $V = A \times L$	
16. Volume of a Cylinder	$V = \pi r^2 h$	
17. Volume of a Cone	$V = \frac{1}{3} \pi r^2 h$	
18. Volume of a Pyramid	$\text{Volume} = \frac{1}{3} Bh$ where B = area of the base	
19. Volume of a Sphere	$V = \frac{4}{3} \pi r^3$ Look out for hemispheres – just halve the volume of a sphere.	<p>Find the volume of a sphere with diameter 10cm.</p> $V = \frac{4}{3} \pi (5)^3 = \frac{500\pi}{3} \text{ cm}^3$
20. Pressure, Force, Area	Pressure = Force ÷ Area Force = Pressure x Area Area = Force ÷ Pressure	<p>Pressure = 10 Pascals Area = 6cm² Find the Force</p>



Block H

104

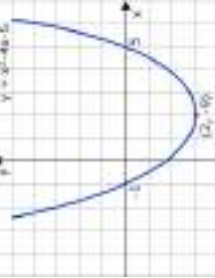


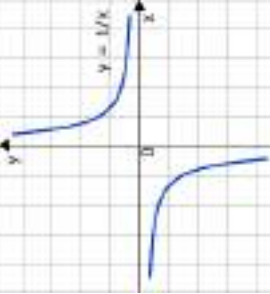
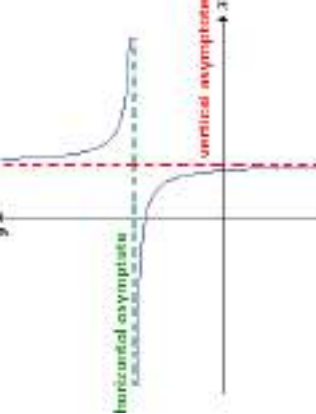



$$F = P \times A = 10 \times 6 = 60 \text{ N}$$

Remember the correct units.

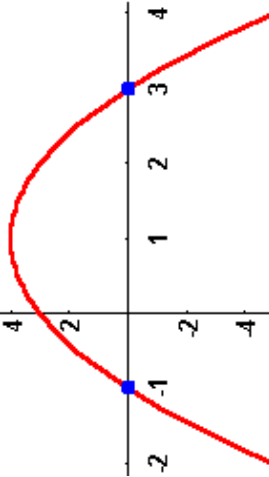



Block H

Topic/Skill	Definition/Tips	Example
1. Quadratic Graph	<p>A 'U-shaped' curve called a parabola. The equation is of the form $y = ax^2 + bx + c$, where a, b and c are numbers, $a \neq 0$. If $a < 0$, the parabola is upside down.</p>	
2. Cubic Graph	<p>The equation is of the form $y = ax^3 + k$, where k is an number. If $a > 0$, the curve is increasing. If $a < 0$, the curve is decreasing.</p>	<p>$a > 0$</p>  <p>$a < 0$</p> 
3. Reciprocal Graph	<p>The equation is of the form $y = \frac{A}{x}$, where A is a number and $x \neq 0$. The graph has asymptotes on the x-axis and y-axis.</p>	
4. Asymptote	<p>A straight line that a graph approaches but never touches.</p>	
5. Exponential Graph	<p>The equation is of the form $y = a^x$, where a is a number called the base. If $a > 1$ the graph increases. If $0 < a < 1$, the graph decreases. The graph has an asymptote which is the x-axis.</p>	
6. Quadratic	<p>A quadratic expression is of the form $ax^2 + bx + c$ where a, b and c are numbers, $a \neq 0$</p>	<p>Examples of quadratic expressions:</p> x^2 $8x^2 - 3x + 7$ <p>Examples of non-quadratic expressions:</p> $2x^3 - 5x^2$ $9x - 1$
7. Solving Quadratics ($ax^2 = b$)	<p>Isolate the x^2 term and square root both sides. Remember there will be a positive and a negative solution.</p>	$2x^2 = 98$ $x^2 = 49$ $x = \pm 7$

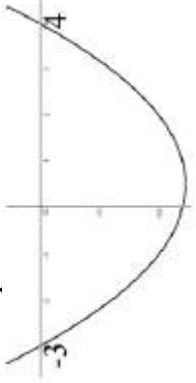


Block H

<p>8. Solving Quadratics by Factorising ($ax^2 + bx = 0$)</p>	<p>Factorise and then solve = 0.</p>	$x^2 - 3x = 0$ $x(x - 3) = 0$ $x = 0 \text{ or } x = 3$
<p>9. Solving Quadratics by Factorising ($a = 1$)</p>	<p>Factorise the quadratic in the usual way. Solve = 0 Make sure the equation = 0 before factorising.</p>	<p>Solve $x^2 + 3x - 10 = 0$</p> <p>Factorise: $(x + 5)(x - 2) = 0$ $x = -5$ or $x = 2$</p>
<p>10. Factorising Quadratics when $a \neq 1$</p>	<p>When a quadratic is in the form $ax^2 + bx + c$</p> <ol style="list-style-type: none"> 1. Multiply a by c = ac 2. Find two numbers that add to give b and multiply to give ac. 3. Re-write the quadratic, replacing bx with the two numbers you found. 4. Factorise in pairs – you should get the same bracket twice 5. Write your two brackets – one will be the repeated bracket, the other will be made of the factors outside each of the two brackets. 	<p>Factorise $6x^2 + 5x - 4$</p> <ol style="list-style-type: none"> 1. $6 \times -4 = -24$ 2. Two numbers that add to give +5 and multiply to give -24 are +8 and -3 3. $6x^2 + 8x - 3x - 4$ 4. Factorise in pairs: $2x(3x + 4) - 1(3x + 4)$ 5. Answer = $(3x + 4)(2x - 1)$
<p>11. Solving Quadratics by Factorising ($a \neq 1$)</p>	<p>Factorise the quadratic in the usual way. Solve = 0 Make sure the equation = 0 before factorising.</p>	<p>Solve $2x^2 + 7x - 4 = 0$</p> <p>Factorise: $(2x - 1)(x + 4) = 0$ $x = \frac{1}{2}$ or $x = -4$</p>
<p>12. Roots of a Quadratic</p>	<p>A root is a solution. The roots of a quadratic are the x-intercepts of the quadratic graph.</p>	
<p>13. Turning Point of a Quadratic</p>	<p>A turning point is the point where a quadratic turns. On a positive parabola, the turning point is called a minimum. On a negative parabola, the turning point is called a maximum.</p>	
<p>14. Completing the Square (when $a = 1$)</p>	<p>A quadratic in the form $x^2 + bx + c$ can be written in the form $(x + p)^2 + q$</p> <ol style="list-style-type: none"> 1. Write a set of brackets with x in and half the value of b. 2. Square the bracket. 3. Subtract $(\frac{b}{2})^2$ and add c. 4. Simplify the expression. 	<p>Complete the square of $y = x^2 - 6x + 2$</p> <p>Answer: $(x - 3)^2 - 3^2 + 2$ $= (x - 3)^2 - 7$</p>

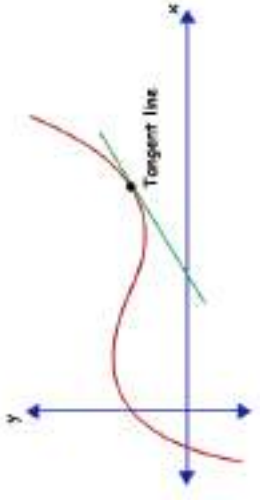
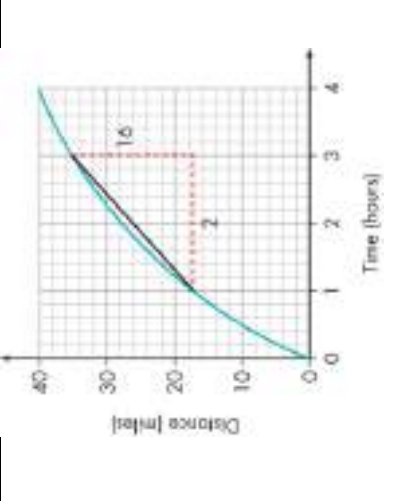


Block H

	<p>You can use the completing the square form to help find the maximum or minimum of quadratic graph.</p>	<p>The minimum value of this expression occurs when $(x - 3)^2 = 0$, which occurs when $x = 3$ When $x = 3$, $y = 0 - 7 = -7$ Minimum point = $(3, -7)$</p>
<p>15. Completing the Square (when $a \neq 1$)</p>	<p>A quadratic in the form $ax^2 + bx + c$ can be written in the form $\mathbf{p(x + q)^2 + r}$ Use the same method as above, but factorise out a at the start.</p>	<p>Complete the square of $4x^2 + 8x - 3$ Answer: $4[x^2 + 2x] - 3$ $= 4[(x + 1)^2 - 1^2] - 3$ $= 4(x + 1)^2 - 4 - 3$ $= 4(x + 1)^2 - 7$</p>
<p>16. Solving Quadratics by Completing the Square</p>	<p>Complete the square in the usual way and use inverse operations to solve.</p>	<p>Solve $x^2 + 8x + 1 = 0$ Answer: $(x + 4)^2 - 4^2 + 1 = 0$ $(x + 4)^2 - 15 = 0$ $(x + 4)^2 = 15$ $(x + 4) = \pm\sqrt{15}$ $x = -4 \pm \sqrt{15}$</p>
<p>17. Solving Quadratics using the Quadratic Formula</p>	<p>A quadratic in the form $ax^2 + bx + c = 0$ can be solved using the formula: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ Use the formula if the quadratic does not factorise easily.</p>	<p>Solve $3x^2 + x - 5 = 0$ Answer: $a = 3, b = 1, c = -5$ $x = \frac{-1 \pm \sqrt{1^2 - 4 \times 3 \times -5}}{2 \times 3}$ $x = \frac{-1 \pm \sqrt{61}}{6}$ $x = 1.14 \text{ or } -1.47 \text{ (2 d.p.)}$</p>
<p>18. Quadratic Inequalities</p>	<p>Sketch the quadratic graph of the inequality. If the expression is $> \text{or } \geq$ then the answer will be above the x-axis. If the expression is $< \text{or } \leq$ then the answer will be below the x-axis. Look carefully at the inequality symbol in the question. Look carefully if the quadratic is a positive or negative parabola.</p>	<p>Solve the inequality $x^2 - x - 12 < 0$ Sketch the quadratic:  The required region is below the x-axis, so the final answer is: $-3 < x < 4$ If the question had been > 0, the answer would have been:</p>



Block H

		$x < -3$ or $x > 4$
<p>19. Solving Linear and Quadratic Simultaneous Equations</p>	<p>Method 1: If both equations are in the same form (eg. Both $y = \dots$):</p> <ol style="list-style-type: none"> 1. Set the equations equal to each other. 2. Rearrange to make the equation equal to zero. 3. Solve the quadratic equation. 4. Substitute the values back in to one of the equations. <p>Method 2: If the equations are not in the same form:</p> <ol style="list-style-type: none"> 1. Rearrange the linear equation into the form $y = \dots$ or $x = \dots$ 2. Substitute in to the quadratic equation. 3. Rearrange to make the equation equal to zero. 4. Solve the quadratic equation. 5. Substitute the values back in to one of the equations. <p>You should get two pairs of solutions (two values for x, two values for y.)</p> <p>Graphically, you should have two points of intersection.</p>	<p><u>Example 1</u> Solve $y = x^2 - 2x - 5$ and $y = x - 1$</p> $x^2 - 2x - 5 = x - 1$ $x^2 - 3x - 4 = 0$ $(x - 4)(x + 1) = 0$ <p>$x = 4$ and $x = -1$</p> <p>$y = 4 - 1 = 3$ and $y = -1 - 1 = -2$</p> <p>Answers: (4,3) and (-1,-2)</p> <p><u>Example 2</u> Solve $x^2 + y^2 = 5$ and $x + y = 3$</p> $x = 3 - y$ $(3 - y)^2 + y^2 = 5$ $9 - 6y + y^2 + y^2 = 5$ $2y^2 - 6y + 4 = 0$ $y^2 - 3y + 2 = 0$ $(y - 1)(y - 2) = 0$ <p>$y = 1$ and $y = 2$</p> <p>$x = 3 - 1 = 2$ and $x = 3 - 2 = 1$</p> <p>Answers: (2,1) and (1,2)</p>
<p>20. Tangent to a Curve</p>	<p>A straight line that touches a curve at exactly one point.</p>	
<p>21. Gradient of a Curve</p>	<p>The gradient of a curve at a point is the same as the gradient of the tangent at that point.</p> <ol style="list-style-type: none"> 1. Draw a tangent carefully at the point. 2. Make a right-angled triangle. 3. Use the measurements on the axes to calculate the rise and run (change in y and change in x) 4. Calculate the gradient. 	

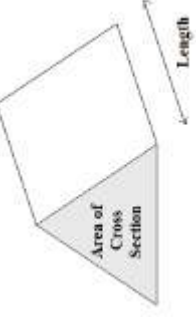
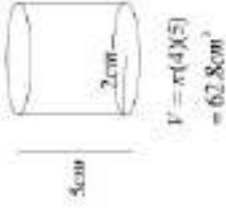
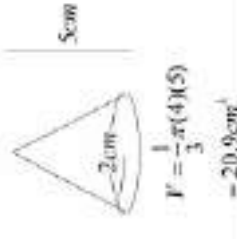
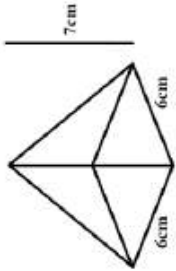
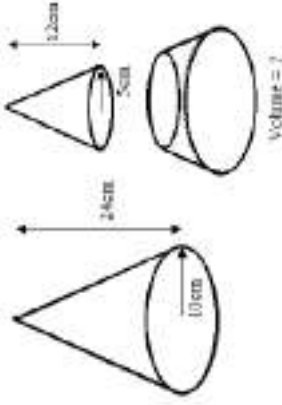


Block H

		$\text{Gradient} = \frac{\text{Change in } y}{\text{Change in } x}$ $= \frac{16}{2} = 8$
22. Area Under a Curve	To find the area under a curve, split it up into simpler shapes – such as rectangles, triangles and trapeziums – that approximate the area.	
23. Estimate	To find something close to the correct answer .	An estimate for the height of a man is 1.8 metres.
24. Approximation	When using approximations to estimate the solution to a calculation, round each number in the calculation to 1 significant figure . \approx means 'approximately equal to'	$\frac{348 + 692}{0.526} \approx \frac{300 + 700}{0.5} = 2000$ <p>'Note that dividing by 0.5 is the same as multiplying by 2'</p>
25. Error Interval	A range of values that a number could have taken before being rounded or truncated. An error interval is written using inequalities, with a lower bound and an upper bound . Note that the lower bound inequality can be 'equal to', but the upper bound cannot be 'equal to'.	0.6 has been rounded to 1 decimal place. The error interval is: $0.55 \leq x < 0.65$ The lower bound is 0.55 The upper bound is 0.65
26. Prism	A prism is a 3D shape whose cross section is the same throughout.	
27. Cross Section	The cross section is the shape that continues all the way through the prism .	



Block H

28. Volume of a Prism	$V = \text{Area of Cross Section} \times \text{Length}$ $V = A \times L$	
29. Volume of a Cylinder	$V = \pi r^2 h$	
30. Volume of a Cone	$V = \frac{1}{3} \pi r^2 h$	
31. Volume of a Pyramid	$\text{Volume} = \frac{1}{3} Bh$ where B = area of the base	
32. Volume of a Sphere	$V = \frac{4}{3} \pi r^3$ Look out for hemispheres – just halve the volume of a sphere.	Find the volume of a sphere with diameter 10cm. $V = \frac{4}{3} \pi (5)^3 = \frac{500\pi}{3} \text{ cm}^3$
33. Frustums	A frustum is a solid (usually a cone or pyramid) with the top removed . Find the volume of the whole shape, then take away the volume of the small cone/pyramid removed at the top.	



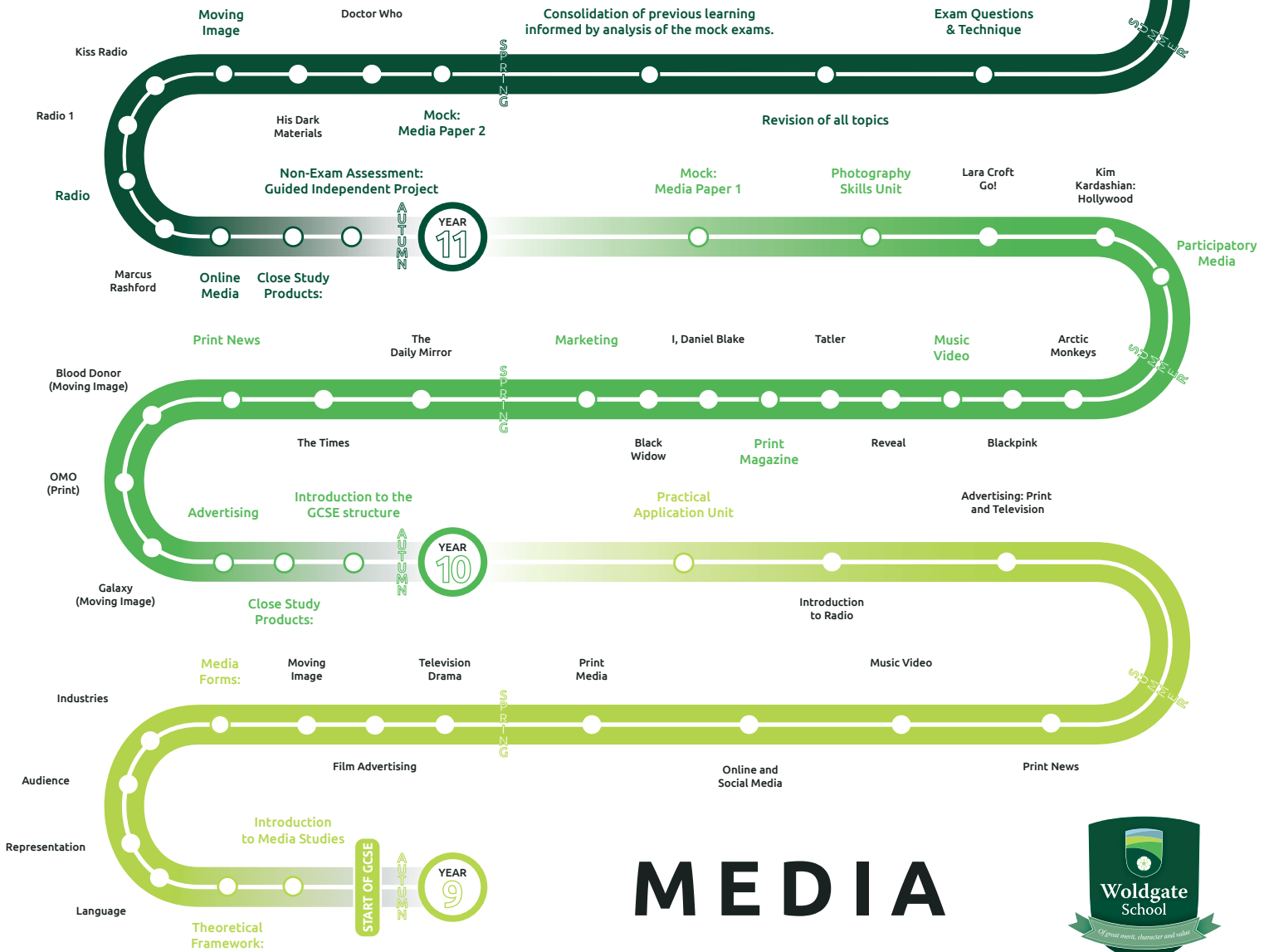
Non-Exam Assessment Marks sent off to exam board



GCSE EXAMINATIONS

Paper 1 – Section A: Representation and Language
Section B: Audience and Industries

Paper 2 – Section A: Television
Section B: Online Social and Participatory Media



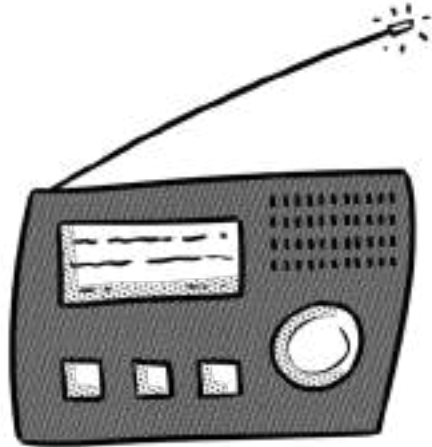
MEDIA



GCSE Media Industries



PIXL Media Studies



Industries and Technologies

- There is no doubt that **technological growth** and **developments** have changed the media landscape and the way audiences consume media products. Referring to the work of contemporary media theorists such as **Henry Jenkins** and **Clay Shirky**, produce a magazine article (for a publication such as the **Media Magazine**) that explores the ways in which new technologies have changed the way producers **produce**, **distribute** and **market** media products. You should include key facts and quotes in your article, alongside examples across the nine different media forms in your double page article.

Industries and Funding

- In order to understand how **funding** works you are going to produce three different pitches to secure funding for a new **media product** (for example a new film or TV series). Each pitch will aim to secure funding from a different source. The three sources are:
 - Government funded.**
 - Not-for-profit.**
 - Commercially funded.**
- Think about how you would tailor your pitch to suit the needs of each **funding source**. You should then write and deliver your pitch, addressing how your product would meet the needs of the **target audience** alongside the funding source.

Industries and Regulation

- In order to understand **regulation** you need to be able to explain how regulation has played a role in shaping the media products audiences consume. Create a GCSE lesson explaining and exploring the function of regulation within the media on a **national** and **global scale**. Within this, you should explore the different types of regulation that function on a national and global scale.

MEDIA INDUSTRIES

noun:

A collection of businesses that produce and distribute media content

Industries and Media Production

- Explore the pros and cons of the **concentration of media ownership**. In your opinion, is it a good thing for **audiences** and **producers**?
- How has the concentration of media ownership affected the ways in which **audiences access** and **consume** media texts?
- In your opinion, how do media products reflect the **social, cultural, historical** and **political** contexts in which they are made?

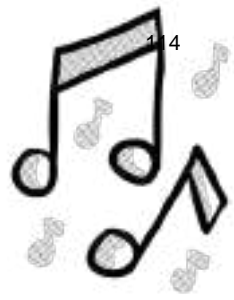
Industries and Ownership

- Two key terms within the area of media ownership are:
 - Globalisation.**
 - Cultural imperialism.**
- In order to fully understand these, you should carry out research into these two terms and find examples of how these have affected different **cultures**, focusing on examples across the nine different media forms. Can you find examples of newspaper and magazine articles (from publications such as **The Guardian** and **Media Magazine**) that explore the impact of these two terms within the modern media landscape?

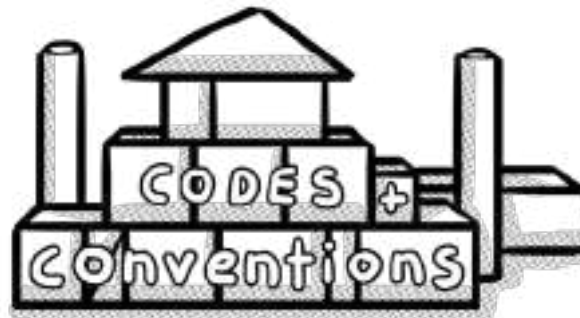
Industries and Convergence

- In order to understand **convergence** fully you need to have a clear understanding of the impact of convergence within media industries across **different platforms**. Choose an industry to explore, assessing how convergence has played a role in **shaping** that specific industry. Refer to specific examples/evidence.
- You also need to have a secure understanding of **cross media ownership**. Can you find examples of convergence between **content** providers, **network** providers and **platform** providers?

GCSE Key Concept: Genre



PIXL
Media Studies



GraspIT

Genre and Pleasures

- Choose three different **genres** to research how they have **changed** and **developed** over time; you should explore how their changes reflect the **historical context** at the time and how the popularity of the genre was linked with society and any issues that were prevalent at the time.
- Steve Neale** argued that genres are 'instances of repetition and difference', explore which elements within a genre tend to **stay the same** (repetition) and which elements tend to change and introduce **innovation** into a genre (differences). You should refer to specific examples in your response.

Genre and Codes & Convention

- Discuss the role **actors** and **star personas** play in shaping genres. Can you think of any specific actors that are associated with genres? Why do you think audiences enjoy watching certain actors play similar roles in genre-driven films?
- What methods do producers use to ensure genres **survive** and **maintain their popularity**?

Genre and Audiences

- Explore why audiences enjoy watching genre-driven films. Why do you think they don't get bored watching **repeated narratives** and **character roles**?
- Referring to the **Uses and Gratifications theory**, explain why audiences enjoy different genres. Look at the listings for your local large cinema and note which genres are most popular in contemporary society. What **uses** and **gratifications** would audiences gain from these genres?
- What role does genre play in **engaging an audience** across the nine different media forms? Which form uses genre the most when it comes to engaging an audience?

GENRE

noun: a type, or category, of media text

Genre and Iconography

- Iconography refers to **visual signs** that are associated with a specific genre, to gain a broader understanding of this you should produce a collage of **genre signifiers** linked with three different genres (that you are studying within your GCSE course), you can produce this as a physical visual collage or a digital poster.
- Iconography is often a key **communicator** for producers. Explain how iconography and the inclusion of signifiers can speak to an audience.

Genre and Industries

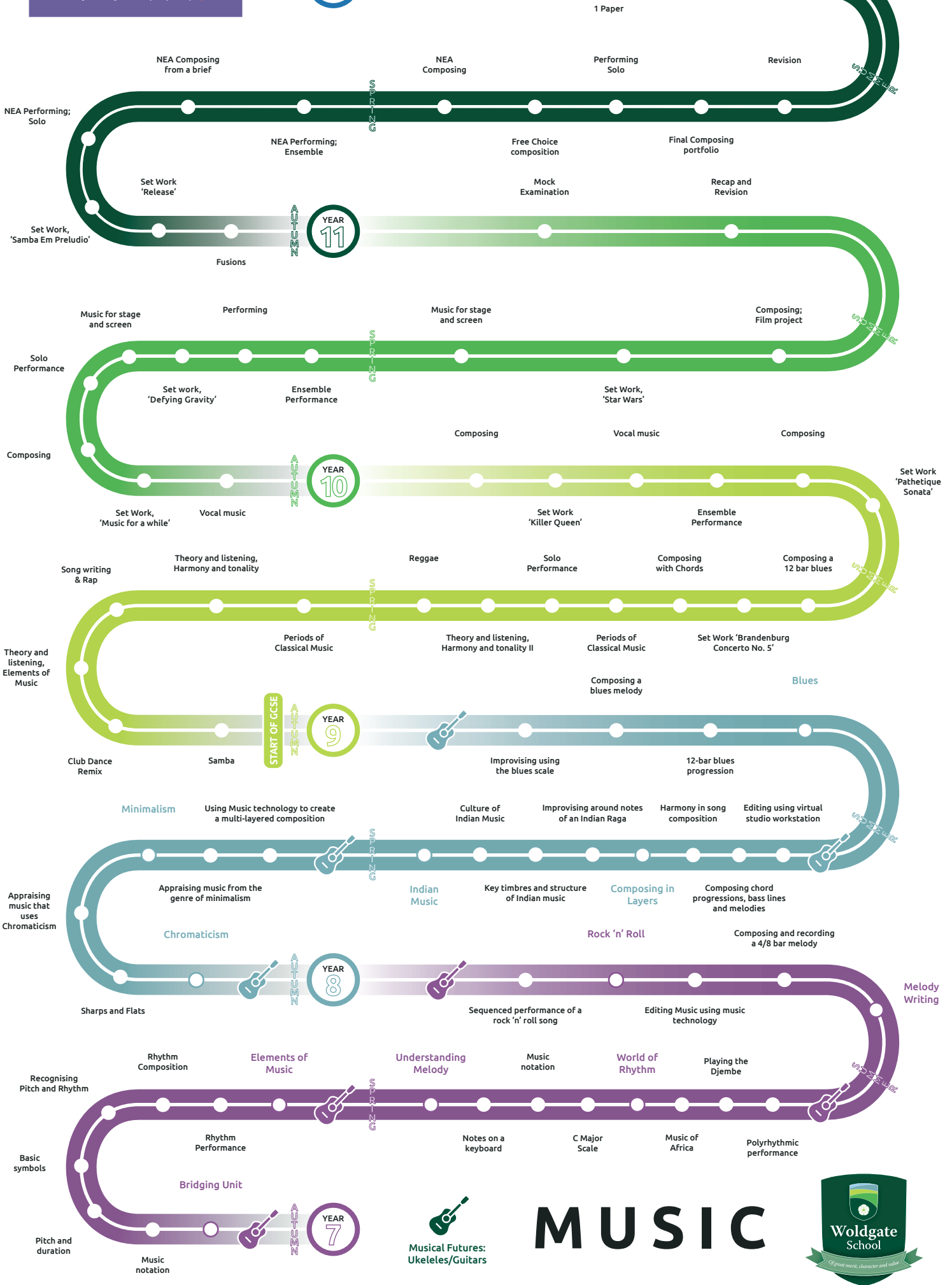
- Film production is a big business with potentially large amounts of **profits** to be made, however funding needs to be secured before any film can reach the **production phase**. Explain how genre is key in securing funding for films.
- Film producers and distributors use genre as a key tool in **marketing** their films to potential audiences, explain the role genre plays in marketing new media texts. Choose a case study of a new media product to illustrate this.

Genre and Themes

- David Buckingham** argues that genres constantly change to **reflect the social period** in which they are produced. Choose a **film genre** to research how it has changed over time: you should choose media texts within the genre that illustrate the **key changes**.



GCSE EXAMINATIONS



GCSE Listening Log

You will use this log in lessons when discussing the set works for the course, but you can also use them for homework when you are asked to listen to a particular piece of Music. Keep it neat, because you will need these for revision! This is your KNOWLEDGE ORGANISER for this set work

<p>Structure</p> <ul style="list-style-type: none"> • Structure is largely determined by the visuals – opening titles allow for themes and melodic music as opposed to underscore. • <i>See separate handout for detail but the structure can be broken down into smaller sections.</i> <ul style="list-style-type: none"> • Introductory fanfare • Ternary form (ABA) – Main theme and contrasting theme • Second part of music contains underscore which introduces a leitmotif for the ‘Rebel Alliance’ 	<p>Tonality/Harmony</p> <p>First half (up to bar 29) is <u>Bb major</u> reinforced by an <u>inverted tonic pedal (bars 1-6)</u> and <u>dominant pedal (bars 11-14)</u>, and phrases that end with a dominant chord of F, creating imperfect cadences. Tonality becomes <u>Atonal</u> in the second half, with <u>clusters</u> and <u>dissonant chords</u> and a sense of <u>bitonality</u> in the last 10 bars, where Ab minor chord clashes with a pedal on C. Use of <u>Quartal Harmony</u> (chords built on 4ths) – see the first 7 bars, also evident in the fanfare. Chords in root position often with added notes. Some <u>chromatic writing</u> and use of unrelated chords create little sense of key (e.g. bars 33-35). Use of <u>augmented 5th</u> adds mystery.</p>	<p>Dynamics</p> <ul style="list-style-type: none"> • Generally <u>quite loud (forte)</u> as a fanfare should be. Very heroic and bold. • Is softer (<u>piano</u>) as the camera pans into space and the titles disappear. • <u>Forte</u> returns when the spaceship comes into view. 	<p>Rhythm/Metre</p> <ul style="list-style-type: none"> • <u>4/4</u> is the main metre adding to the military style. • <u>Triplet figures</u> also used to add to the military style but are also typical of fanfares. • <u>Syncopated accompaniment</u> (e.g. bars 4-6, 21-24) adds excitement and interest. • Pulse is less obvious from bar 33 when the main theme ends. • There is a change to <u>3/4 (triple metre)</u> at bar 44.
<p>Texture</p> <ul style="list-style-type: none"> • Mainly <u>homophonic</u> • Melody often <u>doubled in octaves</u> • Some <u>imitative points</u> e.g. trumpets and trombones in the opening fanfare • A <u>homorhythmic texture</u> of block chords is used at bars 44-50 • <u>Pedal notes</u> used throughout including rhythmic ostinato on pedal C bars 51-end. 	<p>Tempo</p> <ul style="list-style-type: none"> • <u>Brisk Tempo</u> starting with <u>100bpm (Andante)</u>. • Adds to the <u>march/military mood</u>. • Use of <u>rall. & rit.</u> for dramatic effect. • Tempo slows gradually at bars 47-50 then the last 10 bars are much faster (160pm – Molto Allegro). 	<p>Timbre/Sonority/Instruments</p> <ul style="list-style-type: none"> • <u>Full Symphony Orchestra</u> (approx. 90 players). Orchestrated by Herbert W. Spencer. • 10 woodwinds, 11 brass, 6 percussion, harp, 60 strings. • Anthology is a short score with instruments abbreviated. • <u>Tutti</u> – indicates when all instruments are playing. • Use of <u>Tremolo</u> on the violins and other articulation used throughout. • Much use of <u>doubling</u> of parts with few solo lines. 	<p>Melody</p> <ul style="list-style-type: none"> • Bold clearly defined melodies • Use of <u>leitmotifs</u> • Intervals of <u>leaping 4ths and 7ths</u>, and <u>triplet pattern</u> all prominent in the opening fanfare but also in the first melody (motif) along with the <u>first interval of a leaping 5th</u>. • Lots of use of <u>tonic (Bb)</u> and <u>dominant (F)</u> notes. • Main melody dominated by brass instruments. • The B melody of the main theme ternary form section (bars 11-19) contrasts being scored for strings and has more stepwise (conjunct) movement and softer dynamics, but there is still some use of 4ths and 7ths.

Star Wars: Main Title/Rebel Blockade Runner by John Williams

Listening Log

GCSE Music

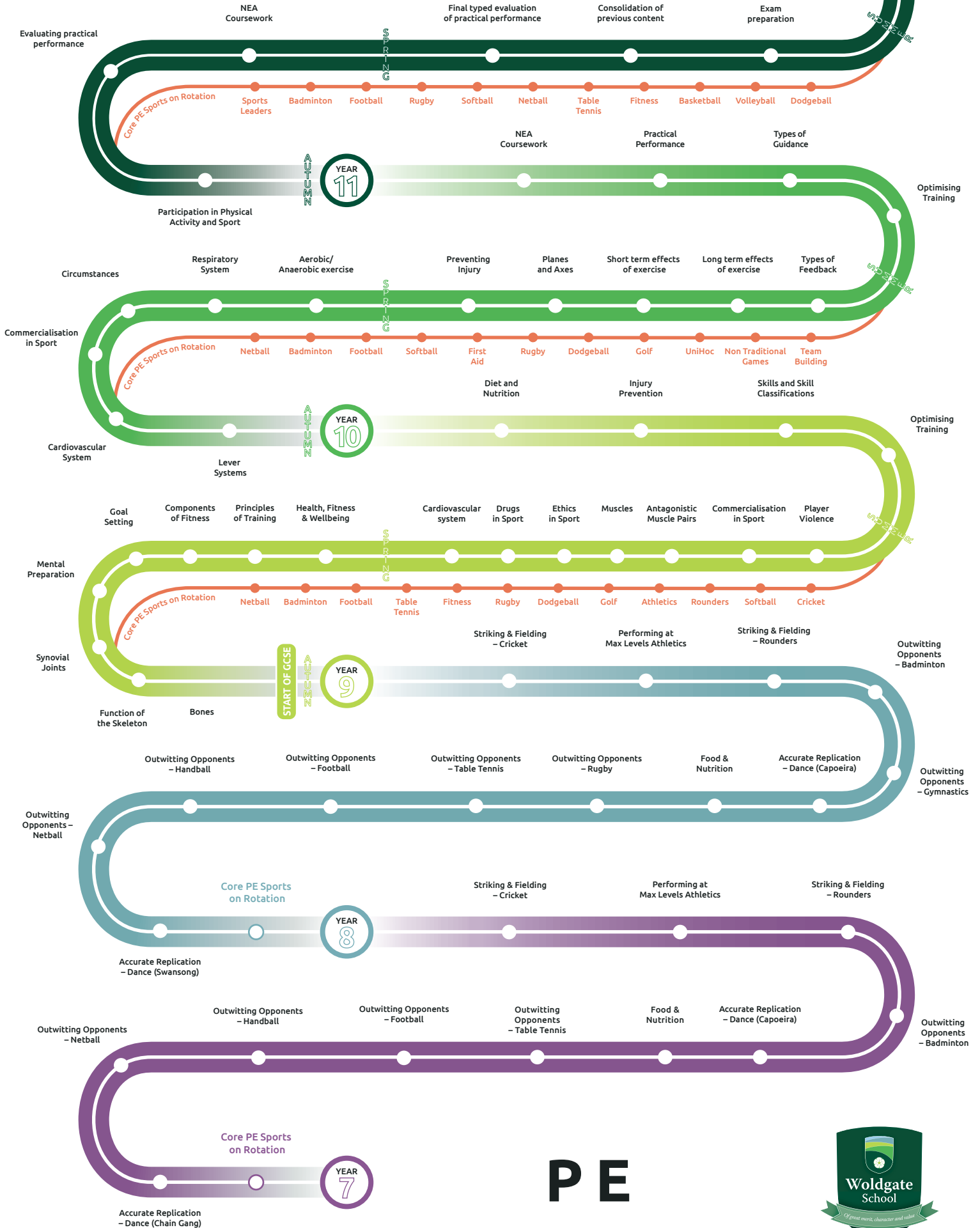
Listening Log

<p>Techniques/Key words: Leitmotifs – musical ideas associated with characters, objects or events that can be adapted to suit different moods. This device was pioneered by Richard Wagner in 19th century operas.</p> <p>Triplets – three notes played in the time taken by two of the same value</p> <p>Marcato – ‘marked’ – ‘accented’</p> <p>Bitonality – music where two distinctly different keys occur at the same time</p> <p>Quartal Harmony – chords based on intervals built up of 4ths rather than the more usual 3rds.</p> <p>Cue: each piece of music from the film score</p>	<p>Other information (e.g. Guitar effects, lyrics information, playing styles of instruments/technology)</p>
<p>Context, affect and background to the piece and composer</p> <ul style="list-style-type: none"> • Composed by John Williams • Music commissioned specially for ‘<i>Star Wars: Episode IV – A new Hope</i>’ by George Lucas (Director) • Released in 1977 – first of a movie franchise – set in a distant galaxy concerning an epic struggle between the evil Galactic Empire and the resistance of the Rebel Alliance. • After a rise in popular film scores in the 50s and 60s (which included the use of jazz, rock and experimental electronics John Williams reinvigorated the large symphonic sound. • The symphonic sound is influenced by the late romantic style. • John Williams is well known for using Leitmotifs and he does so here (on a large scale) • Star Wars is often referred to as a space opera • The opening motif is used to portray heroism and adventure and becomes associated with Luke Skywalker. • The leitmotif returns in many different forms throughout the movie. • The heroic music is important because it is used for the main title music in <u>all</u> of the Star Wars films and unifies them. • The final 10 bars introduces a second leitmotif known as ‘Rebel Blockade Runner’ or ‘Rebel Fanfare’ 	



GCSE EXAMINATIONS

2 Written Papers



PE



Diet and Nutrition

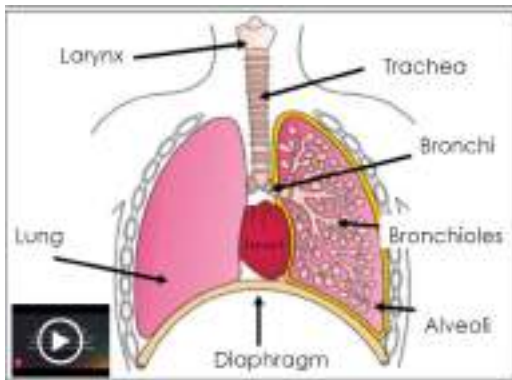
<u>Component of a balanced diet</u>	<u>Function</u>
Carbohydrates	These are the main source of energy
Protein	To build, repair and grow muscle tissue
Fat	Can be broken down to provide energy for Aerobic exercise
Water	Avoids dehydration and allows the brain and muscles to function properly
Fibre	Aids digestion and reduces cholesterol
Vitamins	These help maintain healthy body function, E.g Vitamin D keeps bones strong
Minerals	These help maintain healthy body function, E.g Calcium keeps bones strong

AO1	Knowledge
AO2	Application
AO3	Evaluation/Analysis

GCSE PE KNOWLEDGE ORGANI



The Structure and Function of the Respiratory System



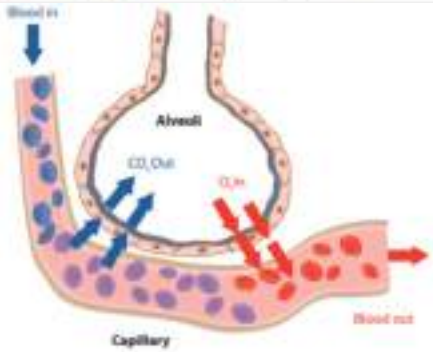
As it warms, moistens and filtered as it travels through the **mouth** and **and nasal passages**, it reaches the **larynx** (it which is also known as the voice box) before it passes through the **trachea** and one of the two **bronchi** into one of the lungs.

After passing into the many **bronchioles**, it finally enters into some of the millions of tiny sacs called **alveoli**.

This is where gas exchange takes place - **oxygen** passes out of the air into the **blood**, and **carbon dioxide** passes out of the **blood** into the air in the **alveoli**.

THE MECHANICS OF BREATHING

INSPIRATION	EXPIRATION
<ul style="list-style-type: none"> • Intercostal muscles contract • Diaphragm contracts • Rib cage moves up and out 	<ul style="list-style-type: none"> • Intercostal muscles relax • Diaphragm relaxes • Rib cage moves down and in



So What Does This Mean?

AIR → **AEROBIC RESPIRATION**

FUEL + OXYGEN makes ENERGY

Glucose + Oxygen → Water + CO2 + Energy

GLUCOSE

AEROBIC EXERCISE is any sport that requires oxygen to be completed (over 45 seconds long)

ANAEROBIC RESPIRATION

Glucose → Energy + Lactic Acid

ANAEROBIC EXERCISE is any sport that does not need to be completed in the presence of oxygen (less than 45 seconds)

AO1	Knowledge
AO2	Application
AO3	Evaluation/Analysis



Skilful Movement and Classification of skills

Skilful Movement

Experts say that you can classify skilful movement through key features and factors.

Efficiency

Pre-Determined

Coordinated

Fluent

Aesthetic

The trampolinist knows her routine before she starts

The volleyball player can jump and spike at the same time successfully

The rugby player picks up the ball and passes in one flowing movement

No energy is wasted when hitting a ball in cricket

The basketball player shoots the ball using the correct technique and it looks good

Netball chest pass	This is an open skill because it can be affected by a number of factors such as the opposition and the location of your team mates, and lots of perceptual decisions need to be made
Dart Throw	This is a closed skill because it is not affected by the environment and is self-paced
Running	This is a simple skill because it does not require many decisions to be made
Somersault	This is a complex skill as it involves multiple elements and decisions

An open skill is a skill that is affected by the environment or other people/performers

For example: a pass in football is dependent on the position of the opposition and your team members

A closed skill is one that is **not affected** by the environment or other people. In other words the conditions stay the same

For example: throwing a dart, the conditions for this are constant.

A simple skill has few decisions to be made. They tend to be taught when the performer is a beginner and they are learnt fairly quickly

A complex skill involves lots of decision making. They can take a lot of time to master. A complex skill often involves multiple elements such as high jump



AO1	Knowledge
AO2	Application
AO3	Evaluation/Analysis



Commercialisation of physical activity and sport

120

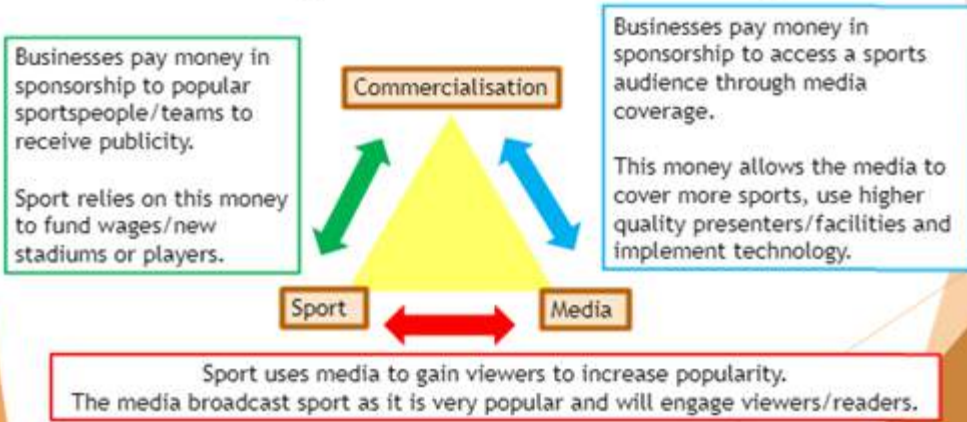
COMMERCIALISATION

Commercialisation is all about introducing a new product to be bought or sold on a large scale

Sports AND sports performers are products that can be bought or sold

Teams	Sports	Media	Businesses
Sports teams can buy and sell players (generally during transfer windows) for an amount of money 	Sports can sell and auction competitions themselves to the highest bidder, such as the Premier League or the Super Bowl	The media can buy and sell sports for different channels, websites, magazines and newspapers 	Businesses can then buy and sell competitions if they are the highest bidder. They can also purchase stadiums, players and teams

Each side of the triangle benefits from the other sides in some way.

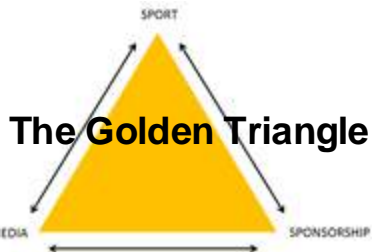


Sponsorship is where a company offers financial support to a team, individual or event

What are the different TYPES of sponsorship?

			
<u>Clothing</u>	<u>Facilities</u>	<u>Finance</u>	<u>Equipment</u>

Types of media: TV, internet, newspapers/magazines, social media



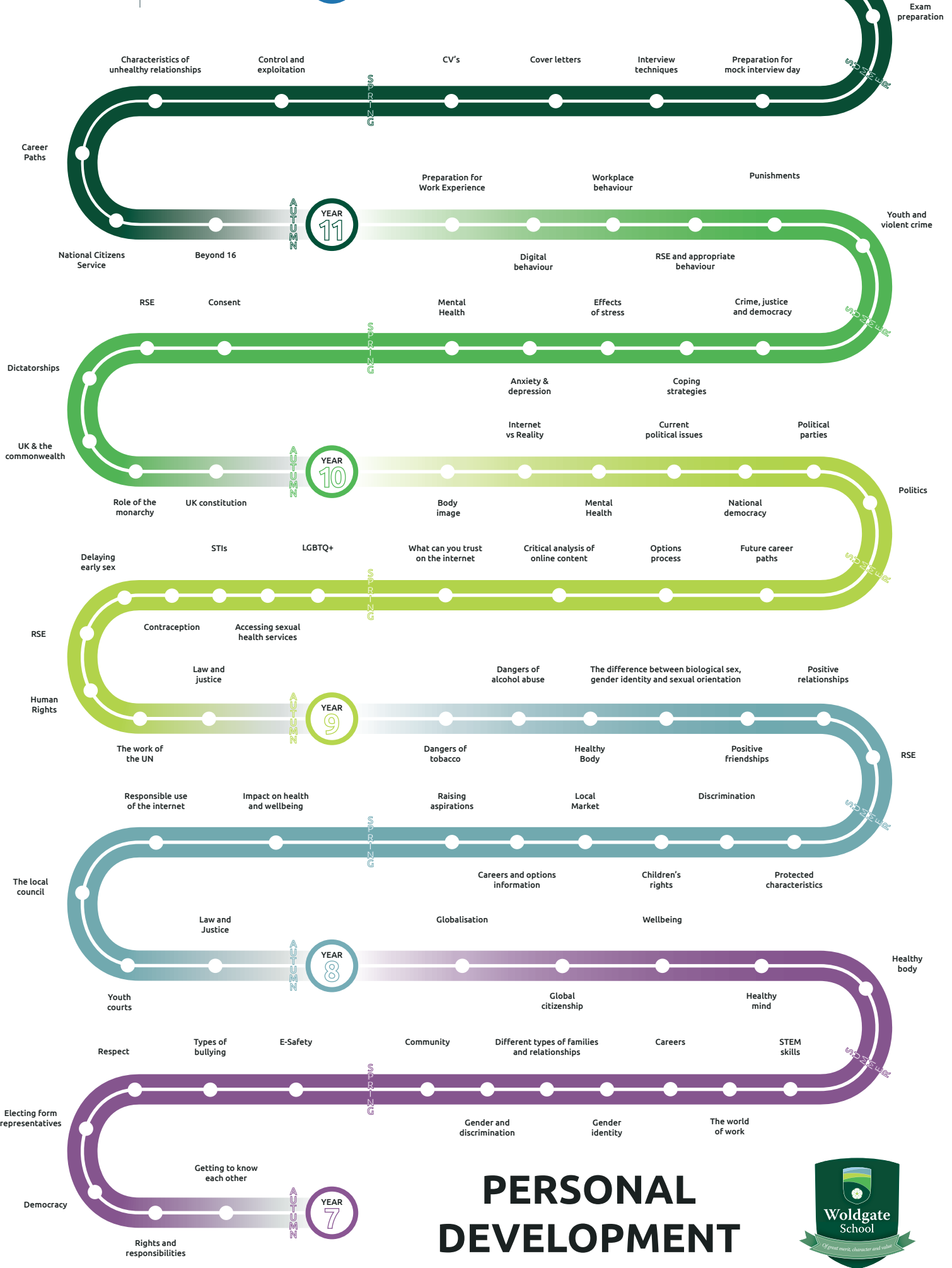
AO1	Knowledge
AO2	Application
AO3	Evaluation/Analysis

GCSE PE KNOWLEDGE ORGANISER

Woldgate School



GCSE EXAMINATIONS



PERSONAL DEVELOPMENT



Violent crime and extremism

Key terms

Key word	What does it mean?
Violent crime	Violent crime covers a variety of offences – ranging from common assault to murder
Knife crime	Knife crime is a crime involving an object with a blade or sharp instrument
Capital punishment	Capital punishment refers to the process of sentencing convicted offenders to death for the most serious crimes (capital crimes) and carrying out that sentence
Extremism	Extremism is the promotion or advancement of an ideology based on violence, hatred or intolerance, that aims to: negate or destroy the fundamental rights and freedoms of others
Radicalisation	If someone is becoming radicalised it means they are displaying extreme views in support of extreme ideologies or beliefs, terrorist groups and activities.
Legitimate protest	Types of protest that are allowed within the law

British Values themes

- Individual liberty
 - Rule of law
- Respect and Tolerance



Arguments for Human rights argument

- Murderers forfeit their human rights when they take other peoples lives.
- The punishment should fit the crime. If the punishment is too light it cheapens our rights to life.

Arguments for Deterrence argument

- It is common sense to say that killing murderers will deter others. It is hard to prove the effect because you are measuring something not happening.
 - A killer who has been executed can never do it again.

Arguments for Execution of the innocent argument

- There are no definite cases of innocent people having been executed since executions started again in the USA in 1977.
- The very small chance of a executing the wrong person is balanced by the benefits to society of deterring murderers.

Arguments against Human rights argument

- Capital punishment goes against our most basic human right - the right to life.
- Lethal injection and electrocution are not always smooth and painless. They can cause painful deaths and are actually a form of torture.

Arguments against Deterrence argument

- No one has ever been able to demonstrate statistically that killing murderers deters others.
- When countries (eg Canada) get rid of the death penalty there is no instant increase in crime.

Arguments against Execution of the innocent argument

- Legal systems always make some mistakes. Executing the wrong person makes people think the law is unfair.

If you have any concerns or are worried someone you know is showing signs, speak to:

Member of the school staff (especially Mrs Handley or Mrs Wright), the Police, Childline

Report inappropriate content at:

<https://www.gov.uk/report-terrorism>

What are the signs to look out for?

The following could describe general teenage behaviour but together with other signs may mean the young person is being radicalised:

- Owning mobile phones or devices you haven't given them
 - Showing sympathy for extremist causes
 - Advocating extremist messages
 - Glorifying violence
 - Accessing extremist literature and imagery
 - Showing a mistrust of mainstream media reports and belief in conspiracy theories
 - Appearing angry about government policies, especially foreign policy.
- Out of character changes in dress, behaviour and changes in their friendship group
 - Losing interest in previous activities and friendships
 - Secretive behaviour and switching screens when you come near.

The following signs are more specific to radicalisation:

Risk factors to radicalisation

Experiencing racism, bullying or discrimination

Need for identity, meaning and belonging

Anger, trauma or sudden loss

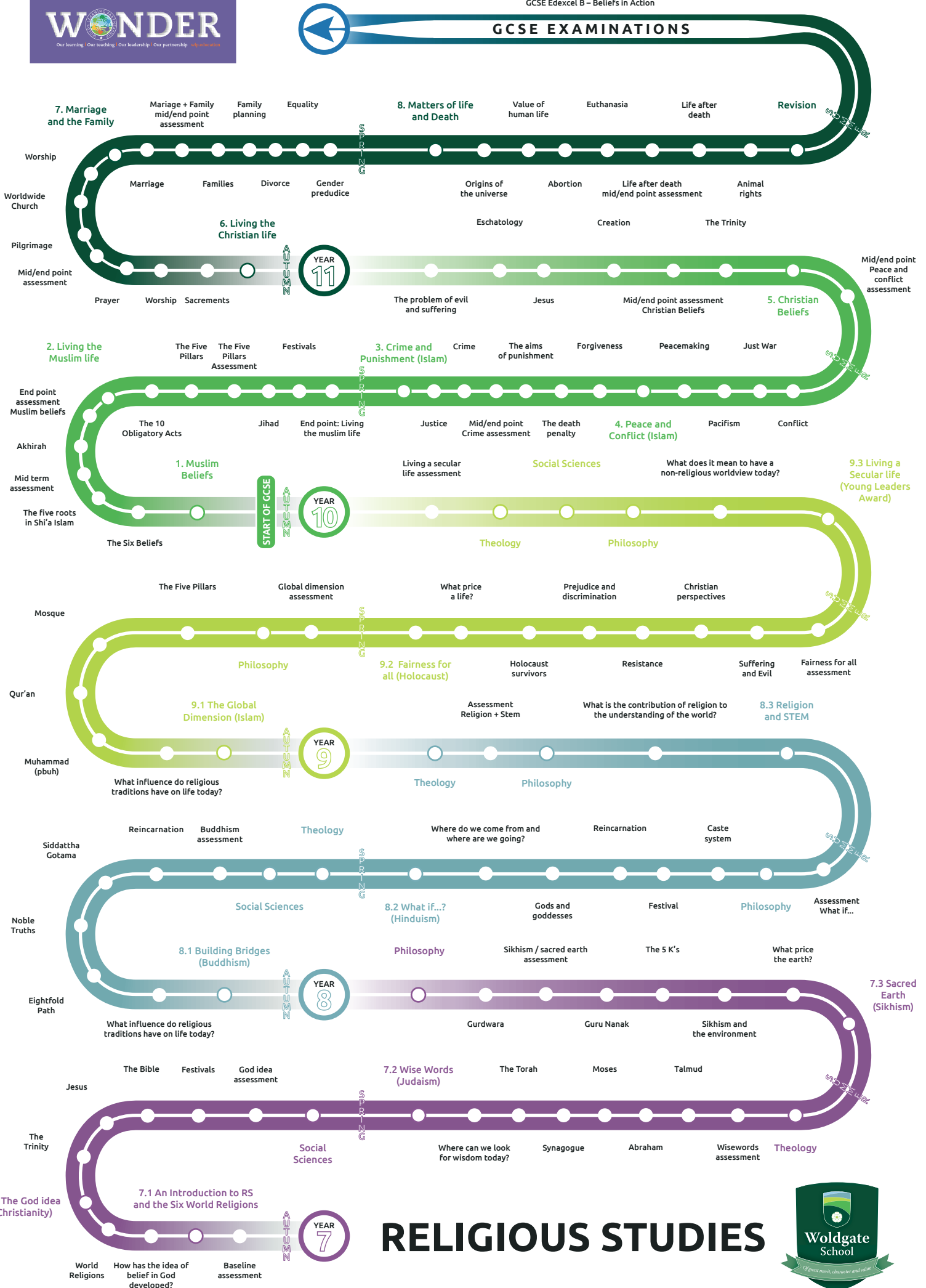
Curiosity or boredom

Mental health issues

Connections to someone expressing extremist views

Accidental or intentional exposure to extremist content





RELIGIOUS STUDIES



Muslim Beliefs

Allah	The Muslim name for God
Tawhid	The belief in Allah's oneness. Allah's oneness means that he has no partners, no helpers and especially no equals.
Beneficence	This means that Allah is good, kind and loving to his creation
Immanence	Allah is close to humans and can be contacted by humans:
Transcendence	Allah is not bound by the restrictions of time and space.
Risalah	The belief in the Prophets of Allah.
Prophet	A messenger of Allah.
Kutub	The belief in the Holy Books sent by Allah (5 in total)
Malaikah	The belief in Angels.
Qadr	The belief in predestination.
Predestination	The belief that Allah knows what choices we will make in any given situation even before we make them.
Akhirah	The belief in afterlife.
Judgment	The belief that humans will be judged by God for the good and bad they have done.
Jannah	The Belief in Paradise.
Jahannam	The belief in Hell.

THE 6 BELIEFS OF SUNNI ISLAM

EXPLANATION

TAWHID - Belief in Allah



Belief in Allah's oneness means that Allah must be the creator of everything since he is the only God. It also means that Allah must be all-powerful and in **control of everything** and that Allah must be present in the universe He has created.

Many Muslims understand this to be THE MOST important belief in Islam as it is this belief that motivates Muslims to follow his commandments,

"Allah has promised **those who believe** (in him) and do good deeds that for them is forgiveness and great reward. QURAN(5:9)

RISALAH - Beliefs in Prophets



Basics for both Sunni and Shi'a Islam:

- The Qur'an mentions 25 Prophets, but Islamic traditional says there have been 124,000!
- According to the Qur'an each prophet was given Allah's word for their generation, but their words were either ignored, forgotten or distorted.
- Prophets are human (have free will), but are often regarded as the perfect humans (obey Allah fully)

Sunni

Sunni's believe that prophets are 'sinless' once called to be a prophet.

Shi'a

Believe that prophets are born sinless, and are prophets from birth.

KUTUB - Belief in Books



The Qur'an names 4 other Holy books, known in Arabic as kutub.

These are from the Jewish and Christian traditions and, according to Islam, in their original form, they were true revelations from God. However, because they were not written down properly they are believed to be corrupted and changed, and so cannot be trusted as the true word of God.

Muslims believe that the Quran is the UNCHANGED Holy Book.

MALAIKAH - Belief in Angels



In Arabic, angels are called Mala'ikah, which means "to assist and help." The Quran describes that angels have been created to worship Allah and carry out His commands.

Angels have no free choice, so it is simply not in their nature to disobey. Angels are genderless and do not require sleep, food, or drink. They are completely without sin, and so are therefore able to enter into Allah's divine presence.

AL-QADR - Belief in predestination

Predestination is the belief that nothing happens by chance. God knows, and wills, all future events (destiny).

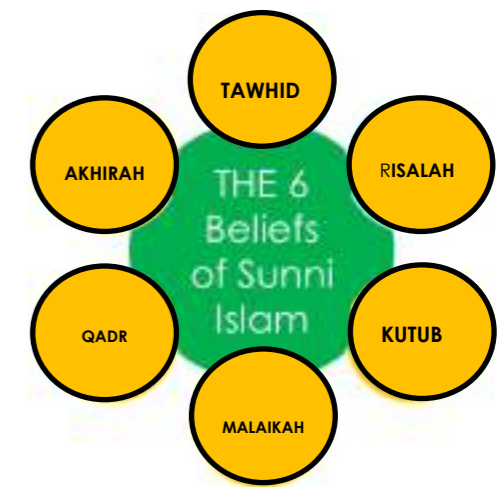
As Allah is Al-Alim (all-knowing), he has intimate knowledge of every single thing in existence because he is the one who has created it all! You can think of this as how a Rolls Royce engineer knows the detailed nature of a jet engine, its capacity, its functions and much more!

AKHIRAH - Belief in afterlife

Akhirah includes Muslim beliefs about life after death, judgement day, Heaven and Hell. This is an important belief because:

Life is a test. There must be some reward or punishment after it.

Sunnis and Shias both believe you cannot be a Muslim without this belief.



<p>Scrolls (Sahifah) of Ibrahim</p> <ul style="list-style-type: none"> • written in the Hebrew language • the oldest of the books • but is now completely lost. 	<p>Torah (Tawrat) of Musa</p> <ul style="list-style-type: none"> • Musa was given this by God in Hebrew • He gave it to the Jews. • Unfortunately because the language was translated and changed it is no longer the word of God
<p>Psalms (Zabur) of Dawud</p> <ul style="list-style-type: none"> • Zabur means song • It was written by Dawud who was given the gift to write songs to praise Allah. • A version of them is in the Christian Bible, but the words have been changed and translated. 	<p>Gospel (Injil) of Isa</p> <ul style="list-style-type: none"> • Injil means good news. • It was written in Aramaic • given to Isa for the Jews/Christians. • A lot of it has been lost, but some of it is written down in the Bible, but the words have been changed.

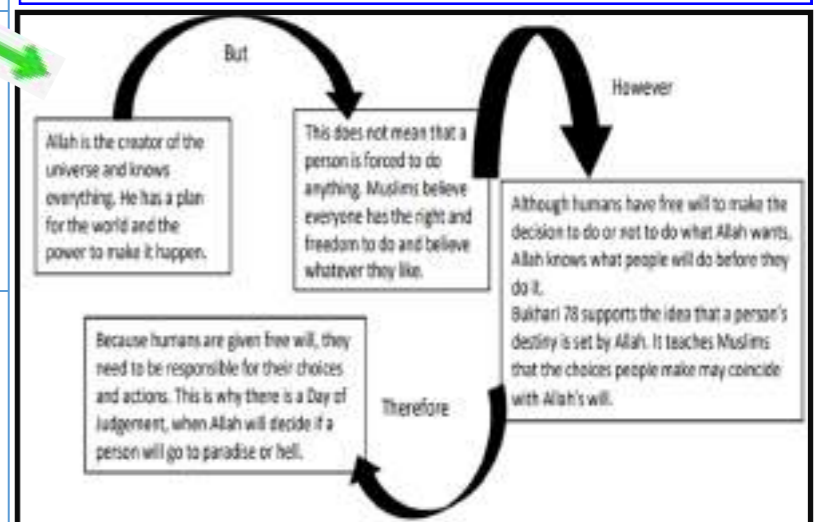
Angels Mentioned by Name

Several angels are mentioned by name in the Quran, with a description of their responsibilities:

Jibril (Gabriel) –The angel of revelation. In charge of communicating Allah's words to His prophets. Revealed the Qur'an to Muhammad.

Mika'il (Michael) – Responsible for keeping the devil out of heaven and protecting worshippers. Also in charge of weather, natural forces and provision for human needs

Izra'il-(Angel of Death) - in charge of taking souls after death

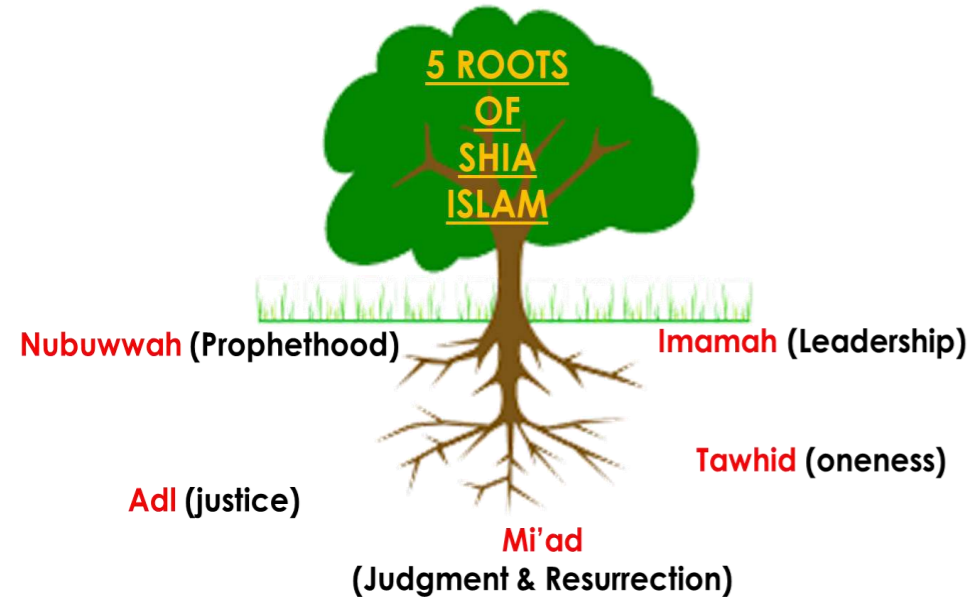



Section 125 Muslim Beliefs

Students should have an understanding of:

1.1	The six Beliefs of Islam: their nature, history and purpose including Kitab al-iman 1: 4; how they are understood and expressed in Sunni and Shi'a Muslim communities today; the importance of these principles for Muslims.
1.2	The five roots of 'Usul ad-Din in Shi'a Islam (Tawhid (oneness of Allah); 'Adl (Divine Justice); Nubuwwah (Prophethood); Imamah (Successors to Muhammad) and Mi'ad (The Day of Judgment and the Resurrection): the nature, history and purpose of the five roots with reference to their Qur'anic basis, including Surah 112 (the oneness of Allah); the importance of these principles for different Shi'a communities today, including Sevener and Twelver.
1.3	The nature of Allah: how the characteristics of Allah are shown in the Qur'an and why they are important: Tawhid (oneness), including Surah 16: 35-36, immanence, transcendence, omnipotence, beneficence, mercy, fairness and justice, Adalat in Shi'a Islam.
1.4	RiSalah: the nature and importance of prophethood for Muslims, including Surah 2: 136; what the roles of prophets teach Muslims, exemplified in the lives Adam, Ibrahim, Isma'il, Musa, Dawud, Isa, Muhammad.
1.5	Muslim holy books (kutub): the nature, history, significance and purpose of Muslim holy books with reference to the Qur'an including Surah 53:4-18, Tawrat (Torah) including Surah 5: 43-48; Surah, Zabur (Psalms), including Surah 4: 163-171; Injil (Gospel), including Surah 53: 36, Sahifah (Scrolls); divergent Muslim views about the importance of the holy books in their lives today.
1.6	Malaikah: the nature and importance of angels for Muslims; how angels Jibril, Izra'il and Mika'il are shown in the Quran, including Surah 19, 32: 11 and 2: 97-98, and their significance for Muslims today.
1.7	al-Qadr: the nature and importance of Predestination for Muslims; how al-Qadr and human freedom relates to the Day of Judgement, including reference to Sahih Al-Bukhari 78: 685; divergent understandings of predestination in Sunni and Shi'a Islam; the implications of belief in al-Qadr for Muslims today.
1.8*	Akhirah: Muslim teachings about life after death; the nature of judgement, paradise and hell; how they are shown in the Qur'an, including Surah 17: 49-72; divergent ways in which Muslims teachings about life after death affect the life of a Muslim today.

TAWHID	The belief in Allah's oneness . Allah's oneness means that he has no partners, no helpers and especially no equals.	
	Allah witnesses that there is no deity except Him, and [so do] the angels and those of knowledge - [that He is] maintaining the creation in justice. There is no deity except Him, the Exalted, in Might, the Wise. Quran 3:18	
NUBUWWAH	The prophets provide guidance from God and should be respected . This is especially so for Prophet Muhammad, as he was God's final prophet and communicated the Qur'an to human beings.	
	Although some prophets were given Holy Books and not others, ALL messengers taught Tawhid to their people .	
IMAMAH	'So [you believers], say " We believe in God and in what was sent down to us and what was sent down to Ibrahim, Isma'il, Isaac, Jacob and the Tribes, and what was given to Musa, Isa, and all the prophets by their Lord. We make no distinction between any of them..." (Surah 2: 136)	
	Shi'a Muslims believe that that leaders such as the imams are necessary to protect the religion and give people guidance on how to live correctly.	
ADL	The largest group in Shi'a Islam, sometimes known as Twelvers, believe that there were twelve imams after the death of Muhammad. Twelvers believe that the twelfth imam is still alive somewhere on Earth, and will one day make himself known and bring equality to all. Due to their close relationship with God, the twelve imams are highly respected.	
	Ismai'ili Shi'a Muslims, sometimes known as Seveners , believe that the seventh imam was Isma'il. Isma'il was the son of one of the Twelve Imams. Seveners believe that each imam can choose his successor, as they believe the last hereditary imam was Isma'il.	
MI'AD	Shi'a Muslims believe that Allah is always right and just . Sometimes Allah may act in ways that are beyond our understanding, but ultimately the world has been created to be fair and just. All Muslims believe there will be a Day of Judgement, when they will have to account for their faith and deeds.	
	Shia Muslims believe that there is intrinsic good or evil in things, and that God commands them to do good actions. They believe that God acts according to a purpose or design, and human reason cannot comprehend this design or purpose in its entirety (though man must always strive to understand as much as he can).	
MI'AD	Mi'ad is another name for the day of judgement . It refers to the belief that all humans will be resurrected after death, judged by God and then either rewarded by Jannah (Paradise) or punished in Jahannam (Hell).	
	Belief in an afterlife encourages Muslims to take responsibility for their actions. They know God will hold them accountable and reward or punish them accordingly. Mi'ad explains humans' existence on Earth, saying that life is a test from Allah. Importantly, though, Muslims believe that Allah will not test them beyond their limits.	



Source of authority	Explanation	Link to topics
Say, 'O Prophet,' "He is Allah—One and Indivisible"; Allah—the Sustainer (needed by all). He has never had offspring (children), nor was He born. And there is none comparable to Him . Surah 112	This surah explain a key Muslim belief about Allah and how he is 'indivisible'. This means he is One being in One form.	Tawhid 
We raised a Messenger in every community (to tell them): "Serve Allah and shun the Evil One. Thereafter Allah guided some of them while others were overtaken by error. Go about the earth, then, and observe what was the end of those who rejected the Messengers, calling them liars." Surah 2:136	This verse explains how Allah is fair and does not punish people without giving them an opportunity to change. Every prophet brought the same message of Tawhid.	Allah Angels Prophets
Say, "Whoever is an enemy to Jibril (Gabriel) - it is [none but] he who has brought the Qur'an down upon your heart." Surah 2:97	This verse explains the Muslim belief in angels. It displays how Jibril is responsible for sending messages to the Prophets.	Allah, Holy Books Angels, Prophets
They say: "When we are turned to bones and particles (of dust), shall we truly be raised up as a new creation?" Tell them: "(You will be raised afresh even if) you turn to stone or iron," Surah 17:49	This verse explains the Muslim belief in afterlife. It addresses the question that how will people be resurrected if they have decomposed over 1000s of years.	Judgement Mi'ad

Marriage:

Marriage is an important rite of passage in Christianity, For Christians, marriage is traditionally accepted as being between a man and women, and is seen as the correct context in which to have a sexual relationship and children.

The Christian purpose of marriage:

1. To provide companionship, friendship and support between a husband and wife
2. To enjoy a sexual relationship within marriage and to have children and raise a family
3. To make a life long commitment to create a stable environment to raise a family.

Christian beliefs about marriage:

- o Most Christians believe marriage is a sacrament – a ceremony where God is involved (this shows that marriage is sacred and binding)
 - o Marriage is believed to be a gift from God
- o Provides security and a stable environment for children
- o Although it is important, God does not want everyone to be married. Jesus himself wasn't married and some priests will not marry as they have a vocation from God.

Sexual relationships:

Christians believe sex is a gift from God and intended for procreation, therefore they believe that sex should take place only within marriage.

Teachings on sexual relationships in the Bible:

- o Causal relationships are wrong – marriage intended for sexual relationships.
 - o Adultery is forbidden in the Ten Commandments
- o Married couples should be faithful to each other as promised in the marriage vows.
- o St Paul in the Bible condemns homosexual acts

Alternative Christian views:

- In a modern society, some of the ideas in the Bible about sexual relationships are outdated. A sexual relationship between a cohabiting couple who are in a stable relationship can be allowed.

Families

Family life has changed over the past 50 years as society has modernised.

Types of families:

1. Nuclear family- two parents (man and women) and their children living together
2. Blended family – Stepfamilies that have joined together through remarriage
3. Extended family – parents, children, grandparents, aunts, uncles and cousins.
4. Single parent family – One parent and children
5. Family with same sex parents – Two same-sex parents and children.

Purpose of the family:

Christians believe that family was God's intention for humans when he created them. Christians believe the purpose for a family is:

Provide the right place for a marriage couple to have children, to teach morals, to raise children into the Christian faith.

Gender prejudice and discrimination:

Role of men and women in the family:

- ❑ Men and women were both made in the image of God
- ❑ Some parts of the Bible suggest that God made women as a 'helpmate' for man. A literal interpretation could be men are the head of the household with women looking after the home and children/
- ❑ Catholics accept men and women were created in the image of God but given different roles.

Gender discrimination in the Church:

Catholic Christians only accept men to hold the position of bishops, priests or deacon and pope. They believe the roles represent Jesus. Who as male.

Promoting gender equality:

Many Christian organisations promote gender equality, including gender equality, including Christian Aid and Tearfund, which believe that gender inequality goes against human rights.

Y11 Religious Studies: Marriage & the Family



Paper 1: Section 2

Roles within the family

Family is important to Christians. Each member within the family is seen to have a special role that they believe God expects them to fulfil.

Christian teachings about the importance of family and role within the family:

Parents:

- Responsibility to get married and have children as that is what God intended
- Parent have a responsibility to love and support their children and keep them safe
- Christian parents have a responsibility to raise their children as Christians – getting them baptised or Christened and introducing them to the Christian community.

Children:

- The Bible teaches that children should honour; obey and respect their parents
- Children are expected to care for their parents in old age.

The family in the local parish

127 How can the parish help families?

- ✓ Supporting couples who are expecting children e.g. organising classes and social events
- ✓ Organising family events and family worship services
 - ✓ Running parental support classes
- ✓ Being involved in rights of passage, e.g. christenings or marriage within the family
- ✓ Encouraging children to attend Sunday School and special services e.g. crib services
 - ✓ Providing counselling support

Worship:

- Local churches will hold family services to allow families to worship together
- In Sunday School children learn more about the Christian faith

Rights of passage:

Rites of passage celebrate key points in a person's life. They include occasions such as birth and marriage. The Church recognises the importance of these key events as a family. Relatives and friends may attend a baptism or marriage ceremony as well as members of the wider Church community.

Divorce:

Divorce is the legal termination of a marriage and different Christians hold different views about it. Attitudes to divorce have significantly changed in recent years.

What Catholic Christians believe:

- o Divorce is not recognised because marriage is for life
 - o Jesus said divorce is wrong
- o Marriage is a sacrament and divorce would break the promises made by God.

What liberal Protestants believe:

- o Divorce is not encouraged, but may sometimes be necessary
 - o Divorce must be acceptable as the UK law allows it
- o People can make mistakes and God is ready to forgive sins

Humanists and atheist views:

Humanists believe that the breakdown of a marriage can cause problems within the family

Family Planning:

Contraception is the intentional prevention of pregnancy.

Types of contraception:

Natural methods of contraception include the rhythm method, which is when a couple have sex when the woman is not ovulating.

Artificial methods are human-made – made objects designed to prevent pregnancy. They include the condom and the birth control pill.

Catholic beliefs about contraception:

- Every sexual act should be open to the possibility of children.
- Contraception prevents the main purpose of sex – having children (procreation).
- Contraception could encourage promiscuity.

Liberal Protestant beliefs about contraception:

- The main purpose of sex is procreation, but sex is also for pleasure as an expression of love between a husband and wife
- Contraception is a sensible method of family planning
- Using artificial methods of contraception does not go against God's teachings and is not a sin.

Important key words:



Monogamy: marriage is only to one person at a time

Cohabitation: Living together in a sexual relationship without being married

Sacraments – an outward ceremony through which God's grace is given

Diocese – a Church area under direction of the bishop

Gender prejudice- believing one sex is superior to another

Gender discrimination- putting the prejudice into action and treating one sex differently because of their sex

Sources of wisdom and authority:

- 'A man will leave his father and mother and be united to his wife, and the two will become one flesh' (Mark 10:6-9)
- 'You shall not commit adultery' (Exodus 20:14)
- 'Do you not know that your bodies are temples of the Holy Spirit' (1 Corinthians 6:18-20)
- 'Children are a heritage from the Lord, offspring are a reward from him' (Psalms 127:3)
- 'Therefore what God has joined together, let no one separate.' (Mark 10:9)



Relationships and Families

Christian Attitudes to Homosexuality

1. **Evangelical Protestants** believe it is sinful because they believe it is unnatural and goes against God's will. The Bible says *"no man shall lie with another man"*.

2. **Roman Catholics believe homosexuality is not a sin but a homosexual sexual relationship is a sin.**

- The Church asks homosexuals to be celibate (no sex)
- Sex should be for procreation (*"be fruitful and multiply"*)
- The Church teaches people cannot help being homosexual therefore they should not be discriminated against.

3. **Church of England Christians** believe that it is acceptable for a homosexual couples to be in a relationship but not get married.

- They believe this because the Bible defines marriage as between man and woman.
- Same-sex marriage is now legal in the UK but churches can opt out of the new law - Church of England and Roman Catholics have opted out; Quakers haven't.

4. **Quakers fully welcome homosexuals** as God created everyone equally and in the bible it states *'All one in Christ'*.

- Christians belief in love & acceptance for all people.
- Same-sex friendships were admired in the Bible e.g. Jonathan & David.
- We have been given freewill.

Christian Attitudes to Sex Outside Marriage

Against—sex before marriage

- God gave sex for the procreation of children, who should be brought up in a Christian family. So sex should only be in marriage.
- St Paul taught *"God wants you to be holy and free from sexual immorality"*.

For sex—before marriage

- Liberal Christians** may believe cohabitation is ok in long-term committed relationships when marriage is intended.
- Sex can be an expression of love.
 - The Archbishop of York supported Prince William and Kate's decision to cohabit.

All Christians are against adultery because:

- Adultery against the 10 Commandments.
- Adultery breaks the wedding vows, which are a promise to God.
- Jesus taught that adultery was wrong.

Christian attitudes towards contraception

All Christians agree that having children is God's greatest gift.

In the bible it states *'be fruitful and multiply'*.

Against the use of contraception because:

- It teaches that artificial contraception goes against natural law.
- Every sexual act should have the potential of conceiving a child, contraception goes against God's plan.
- They believe the use of artificial contraception is a sin and believe it can encourage promiscuity.
- There are not against family planning as they believe in the **rhythm method** to space the births of their children.

RCC do not accept contraception

Allow contraception the use of contraception because:

- Not every sexual act should potentially lead to conceiving a child.
- Sex can be an expression of love not just for procreation.
- Using contraception can allow the parents to choose the right family size for them to allow for the best quality of life.
- It can help protect the mother's health.
- Free-will
- The Church of England do accept contraception.

Muslim Attitudes to Homosexuality

A homosexual relationships are forbidden in Islam. In most Muslim countries it is against the Law.

- In Islam sexual orientation is considered a choice.
- Islam considers same-sex relationships to be against the natural law of God.
- The aim of sex is to create children which homosexual couples cannot do.

Most schools of Shari'ah law view homosexual sex as deserving the same punishment as adultery, i.e. death, although it is rarely, if ever, enforced. To be convicted a person must confess or there must be four eyewitnesses to the act.

"Must you, unlike (other) people, lust after males and abandon the wives that God had created for you? You are exceeding all bounds."

Muslims in support of homosexuality

Some Muslims feel homosexuality is acceptable as Islam is a religion of tolerance and Allah created everyone equally. In Britain there are some organisations such as the **Inclusive Mosque Initiative** that believe homosexuality should be accepted in Islam.

Muslim- Sexual relationships outside of marriage

Muslims are against sex before marriage because:

- Sexual relationships belong in marriage and nowhere else. All Muslims are encouraged to marry and enjoy sex, which is given by Allah, for procreation.

Muslims are against adultery because:

- Shari'ah law says it is wrong and can be punished by death by stoning.

- However just as for homosexuals relationships all convictions under law require either a confession or four separate witness accounts of the act.

And do not approach adultery—it is indeed a shameful deed; and a very evil way.

The (unmarried) woman or the (unmarried) man found guilty of sexual intercourse—lash each one of them with a hundred lashes.

Muslim attitudes towards the use of contraception

- Contraception is allowed, only for married couples.
- Most Muslim allow the use of contraception for family planning as long as it is not used to prevent having children altogether.
- Artificial methods are accepted if the wife's health is at risk, to space out pregnancies or to avoid serious financial difficulties.
- **"God wishes to lighten your burden; man was created weak."** Many Muslims believe this means contraception is ok to avoid hardship on people.
- Evidence from the Hadith shows Muhammad knew of birth control and seemed to approve.

Some Muslims think the use of contraception is wrong.

- Interferes with God's plan.
- Children are seen as a gift from God.
- God gives people the strength and means to cope with any children. *"Do not kill your children for fear of poverty, God will provide for them"*

Importance of a Christian marriage

1. Marriage is seen as a gift from God - Jesus taught that a man and woman 'become one' when they marry to provide companionship for each other.
2. It is also a sacrament - a very special ceremony undertaken by Christians where God is present and brings about a change in their life. This is why the vows are binding.
3. It is a sign of commitment and love towards one another. Christians believe marriage should reflect God's love so a popular reading at weddings is Paul's letter to the Corinthians, explaining what love is.

4. It also acknowledges the **beginning of a sexual relationship** where the couple can procreate, as part of God's will—"be fruitful and multiply."

Marriage vows express the following promises.

- Marriage is for life.
- No matter what happens in life your partner will love you.
- I am committed to you until the end of life. God is in this marriage as well. The marriage is sacred.
- There is no-one else but you.
- It is a promise of commitment.
- **'Do not commit adultery' - marriage is sexually exclusive.**

129

Some Christians are against divorce because:

- Marriage is for life. A couple married in a RC Church have become "one flesh", and stay married in the eyes of God until one partner dies. Couples expected to keep vows "**until death us do part.**"
- Marriage is a sacrament, a sacred agreement made before God and should not be broken. "**What therefore God has joined together, let not man separate.**"
- Also Jesus said it was wrong. **'Anyone who divorces his wife....and marries another woman commits adultery against her.'**

RCC Church says marriage can be annulled. This is not divorce.

Annulment is when the RC Church agrees that the marriage was not valid. The Roman Catholic Church encourages couples to work together to repair their relationship and to uphold the vows they made to one another before God.

Church of England

Luke's Gospel. 'I tell you any one who divorces his wife, except for marital unfaithfulness, and marries another commits adultery'. This means that there are exceptions that the Son of God would tolerate. Moses says a very similar thing

Nature of families: Christian

Christian families are often **nuclear families** as it is considered a good environment to raise children. 'Honour your mother and father'

Purpose of families:

1. Educate children about their faith and be good role models.
 2. Nurture their spiritual lives and make daily prayer apart of family routine.
 3. Christian Church teaches both parents and children have responsibilities to one another.
- "Honour your mother and father".**
- Children are a gift from God and should be respected.
- "Children are a heritage from the LORD."**

Nature of families: Muslim

Many Muslim families are **extended** families as it is part of God's plan for human beings. The family shapes the morals and values and character of children.

Purpose of families:

1. Parents are protectors of their children from sin.
2. Children are a blessing from God and parents have a duty to raise them to be good Muslims. Teach to read the Qur'an in Arabic.
3. Children have a duty to be respectful to their parents. **"It is one of the greatest sins that a man should curse his parents."**

Christian attitudes towards gender equality

Evangelical Christians: Men should be the head of the family and women should not speak in church or be priest.

"I do not permit a woman to teach or have authority over a man; she must be silent."

Roman Catholic Church: Men and women should have equal roles because men and women have equal status in the eyes of God. However, only men should become priests. Jesus only chose men to be his successors. Jesus was a man and the priests represent Jesus in Mass.

Church of England: Men and women should have equal roles in life including religion and so allow women priests.

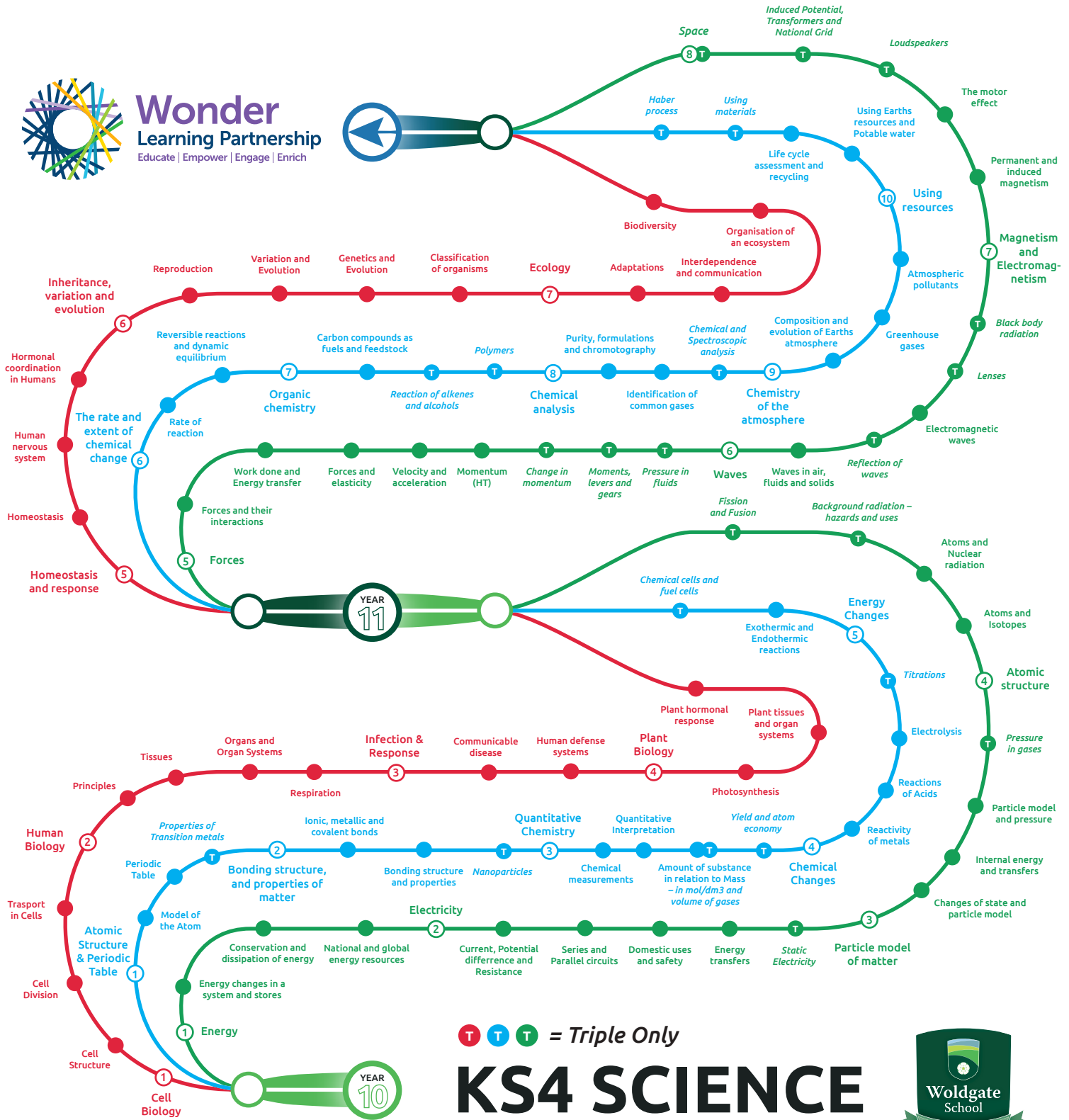
- Jesus always treated everyone equally and Christian's should follow in his footsteps.
- In the bible it states **"all one in Christ Jesus"** and **"made in God's image"** reinforcing there is no difference between men and women.

Muslim attitudes towards gender equality

1. Muslims believe that God created all people equally. Muhammad worked to unite the tribes in Madinah into one community (ummah) under God, with equality and justice for all.
2. Islamic law recognises full property rights for women before and after marriage.
3. In the event of a divorce, her husband must provide child support.
4. Muslim families place a high value on the mother's role to bring up her children in Islam. Men are expected to provide for families and make decisions about their general welfare.



Wonder Learning Partnership
Educate | Empower | Engage | Enrich



T T T = Triple Only

KS4 SCIENCE

■ Biology ■ Chemistry ■ Physics



Biology 3: Infection and Response

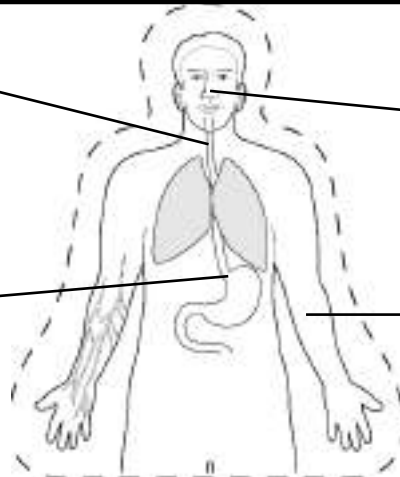
Section 1: Pathogens and Diseases

Disease	Pathogen	How it is spread	Effect	Prevention/ Control
1 Measles	Virus	Droplets from sneezes and coughs	Can be fatal	Vaccination of children
2 HIV	Virus	Sexual contact, needle exchange	Damages some white blood cells	Antiretroviral drugs when infected
3 Tobacco Mosaic Virus	Virus	Direct contact	Mottling of leaves, reduces photosynthesis	
4 Salmonella	Bacteria	Infected food	Fever, abdominal cramps, diarrhoea, vomiting	Vaccination of poultry (chickens).
5 Gonorrhoea	Bacteria	Sexual contact	Discharge from penis/vagina, pain when urinating	Controlled by antibiotics. Spread prevented by condoms.
6 Rose Black Spot	Fungus	Spores carried by water or wind	Leaves turn yellow, fall early. Photosynthesis reduced.	Treated by fungicides or destroying affected leaves.
7 Malaria	Protist	By a vector – mosquito	Fever, can be fatal.	Preventing mosquitos from breeding, using mosquito nets.

Section 2: Non-Specific Defences

8 Trachea and Bronchi
Produces **mucus** to **trap pathogens**.
Contains **cilia** to **move mucus** for swallowing

10 Stomach
Contains **hydrochloric acid** to destroy pathogens.



9 Nose
Contains **hairs** and **mucus** to **trap pathogens**

11 Skin
A **physical barrier** to pathogens.



Section 3: Key terms

12 Pathogen	A microorganism that causes disease .
13 Bacteria	A type of pathogen that produces toxins that damage tissues .
14 Viruses	A type of pathogen that lives and replicates within cells and causes cell damage . It is difficult to kill viruses without damaging cells .
15 Antibodies	Some white blood cells (lymphocytes) produce antibodies. These bind to pathogens and destroy them or stick them together .
16 Antitoxins	Some white blood cells (lymphocytes) produce antitoxins. Antitoxins neutralise toxins .
17 Antibiotics	Antibiotics kill bacteria . Specific antibiotics should be used for specific bacteria . Some bacteria are resistant to antibiotics. Do not kill viruses .
18 Painkillers	Painkillers relieve symptoms but don't kill pathogens .
19 Phagocytosis	Some white blood cells (phagocytes) engulf pathogens .

Section 4: Drugs

22 Aspirin	Originates from the willow tree.
23 Digitalis	A heart drug . Originates from foxglove plants.
24 Penicillin	Discovered by Alexander Fleming from the Penicillium fungus .
25 New drugs	Most new drugs are synthesised by chemists in the pharmaceutical industry . The starting point may be a chemical extracted from a plant .

20 Natural Immunity

Pathogen enters body

The correct white blood cell is found

Antibodies are produced

The white blood cells remain as memory cells

If the pathogen returns, antibodies will be produced quickly

21 Vaccination

Dead or weakened pathogen is injected

The correct white blood cell is found

Antibodies are produced

The white blood cells remain as memory cells

If the pathogen returns, antibodies will be produced quickly

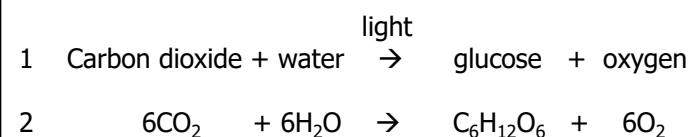
Section 5: Clinical Trials

Trial Stage	Purpose
26 1. Preclinical – cells, animals	Test for toxicity and efficacy before testing humans
27 2. Healthy volunteers	Very low doses to test for toxicity .
28 3. Patients	Larger groups. Test for toxicity, efficacy and dose . Placebos may be used in a double-blind trial .

Clinical Trial Key Terms

29 Placebo	A drug with no active ingredients , designed to test if the effects of a drug on a patient are just psychological .
30 Double-blind trial	The volunteers do not know which group they are in, and neither do the researchers, until the end of the trial
31 Toxicity	How harmful the drug is. May have dangerous side effects .
32 Efficacy	How effective the drug is.
33 Dose	The amount of the drug given to the patient.

Section 1: Photosynthesis Equation



Section 2: Key terms

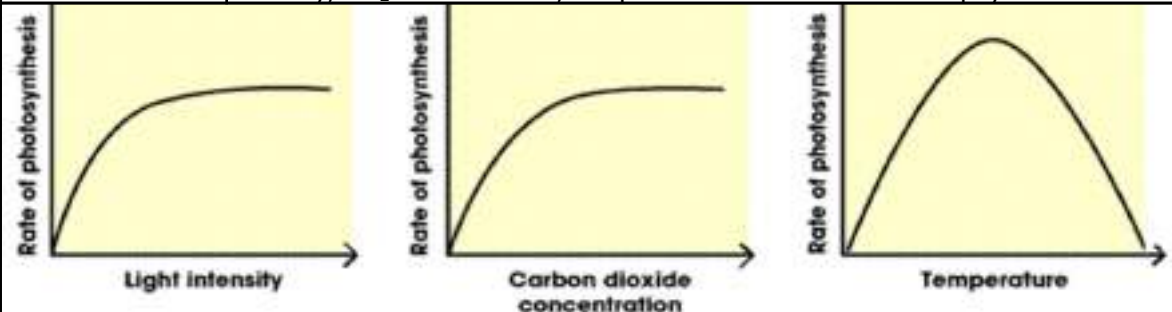
3 Chloroplast	The plant organelle where photosynthesis takes place.
4 Chlorophyll	The green pigment that absorbs energy from light .
5 Endothermic	Photosynthesis takes energy in (in the form of light). It is an endothermic reaction.
6 Diffusion	The spreading out of particles by random motion from where they are in high concentration to a low concentration. Occurs in gases and liquids.

Section 3: Uses of Glucose

- 7 Used in **respiration** to provide **energy**.
- 8 Converted into **starch** for **storage**.
- 9 Converted into **fats** and **oils** for **storage**.
- 10 Produce **cellulose** to **strengthen** the **cell wall**.
- 11 Produce **amino acids** to **make proteins** (also needs nitrate ions from the soil)

Section 4: Limiting Factors

12 Limiting Factor The factor that stops the rate of photosynthesis from increasing; could be light intensity, CO₂ concentration, temperature or amount of chlorophyll.



13 Light Intensity
Initially light is the limiting factor. When the graph plateaus something else (e.g. CO₂ concentration, temperature) is limiting the rate.

14 CO₂ concentration
Initially CO₂ concentration is the limiting factor. When the graph plateaus something else (e.g. light intensity, temperature) is limiting the rate.

15 Temperature
As temperature increases, the rate of photosynthesis increases. Above the optimum there is a decrease in photosynthesis. Enzymes needed for photosynthesis become denatured.

Section 5: Respiration

16 Energy	Energy in organisms is needed for chemical reactions to build larger molecules, movement and keeping warm .
17 Aerobic Respiration	Aerobic respiration provides energy . It requires oxygen . It is an exothermic reaction (produces heat). In mitochondria . Glucose + oxygen → carbon dioxide + water C₆H₁₂O₆ + 6O₂ → 6CO₂ + 6H₂O
18 Anaerobic Respiration (muscles)	No oxygen needed. Provides less energy than aerobic respiration as glucose not fully oxidised . Occurs during intensive exercise . In cytoplasm . Glucose → lactic acid
19 Lactic Acid	Produced in anaerobic respiration in muscles . Build up of lactic acid causes fatigue . Lactic acid must be taken to the liver by the blood so that it can be oxidised back to glucose .
20 Oxygen Debt	The amount of extra oxygen the body needs after exercise to react with the lactic acid and remove it.
21 Anaerobic Respiration (plant and yeast cells)	No oxygen needed. In yeast cells it is called fermentation – economically important for manufacture of bread and alcoholic drinks . In cytoplasm . Glucose → ethanol + carbon dioxide

Section 5: Response to Exercise

22 Increase in breathing rate	Increases rate at which oxygen is taken into the lungs.
23 Increase in heart rate	Oxygenated blood is pumped around the body at a faster rate. Carbon dioxide is removed at a faster rate.
24 Increase in breath volume	A greater volume of oxygen is taken in with each breath.

Section 6a: Metabolism

25 Metabolism The **sum of all the reactions** in a **cell** or **body**. Some of these reactions **require the energy released from respiration**.

Section 6b: Metabolic Reactions

- 26 Conversion of glucose to starch, cellulose or glycogen.
- 27 Formation of lipids from glycerol and fatty acids
- 28 Use of glucose and nitrates to make amino acids (plants only)
- 29 Respiration
- 30 Breakdown of proteins to urea

C4 Chemical Changes

Reactions of acids



- Acid + metal → salt + hydrogen
- Acid + alkali → salt + water
- Acid + insoluble base → salt + water
- Acid + carbonate → salt + water + carbon dioxide

Hydrochloric Acid → Chlorides



Nitric Acid → Nitrates



Sulphuric Acid → Sulphates



HT: OILRIG
e.g. 2HCl + Mg → MgCl₂ + H₂
Magnesium is oxidised
Mg → Mg²⁺ + 2e⁻

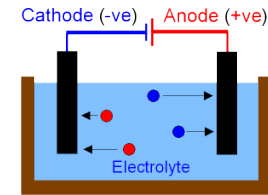
HT: Strong and Weak acids

Concentration of hydrogen ions in mol/dm ³	pH
0.10	1.0
0.010	2.0
0.0010	3.0
0.00010	4.0

Electrolysis

..of molten:

Higher:
At the cathode
Pb²⁺ + 2e⁻ → Pb

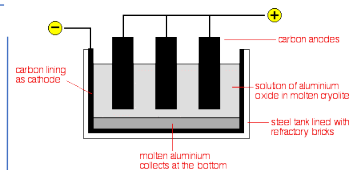


- Negative non-metal ion
- Positive metal ion

Higher:
At the anode
2Br⁻ → Br₂ + 2e⁻
or
2Br⁻ - 2e⁻ → Br₂

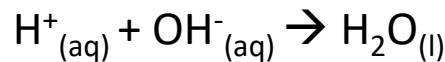
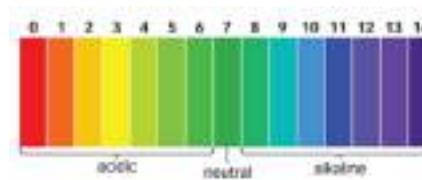
..to extract aluminium:

Oxygen goes to anode → CO₂ (needs replacing)



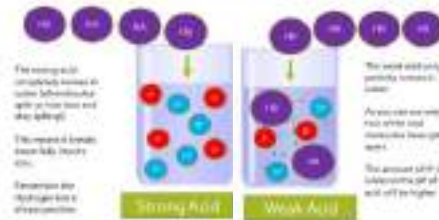
Cryolite reduces the melting point, lower energy cost

Neutralisation

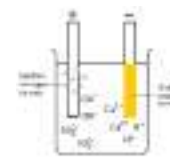


Acids produce H⁺ ions
Alkalis produce OH⁻ ions

Strong and weak acids



..of solutions:



At the cathode:
Least reactive element is made
Reduction happens HT:
Mg²⁺ + 2e⁻ → Mg
2H⁺ + 2e⁻ → H₂

At the anode:
Halide (Gr7) or Oxygen is made
Oxidation happens
HT: 2Cl⁻ → Cl₂ + 2e⁻
4HO⁻ → 2H₂O + O₂ + 2e⁻

Reactivity depends on tendency to form metal ion

Extraction of Metals

The lower the position of a metal in the reactivity series, the easier it is to extract.

- Potassium
 - Sodium
 - Calcium
 - Magnesium
 - Aluminium (Carbon)
 - Zinc
 - Iron
 - Tin
 - Lead
 - Copper
 - Silver
 - Gold
- Extract through Electrolysis: Potassium, Sodium, Calcium, Magnesium, Aluminium (Carbon)
- Extract by burning with carbon: Zinc, Iron, Tin, Lead
- Extract by burning in air: Copper, Silver
- Occur native in the ground: Gold



A and C are Cations (Positive ions)
B and D are Anions (Negative ions)
Double Displacement Reaction

HT: OILRIG

Oxidation Is Loss of electrons
Reduction Is Gain of electrons

Metal + Oxygen → Metal Oxide

Metal + Water → Metal Hydroxide + hydrogen

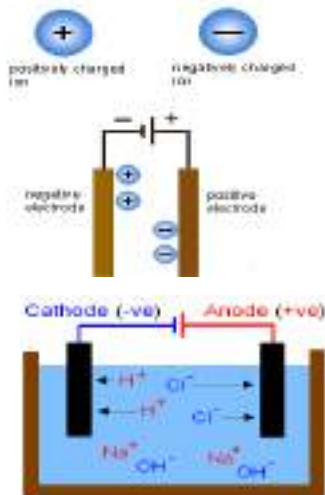
Metal + acid → Metal salt + Hydrogen

Example Apparatus
Molten compounds or less
reactive salt solutions

Positive ions move to negative electrode. Negative ions move to positive electrode.

More reactive metal solutions
e.g. Sodium Chloride solution
(Brine)

- If the metal is more reactive than Hydrogen
- Hydrogen is produced at the Negative electrode (instead of the metal).
- Metal hydroxide is produced in the solution.



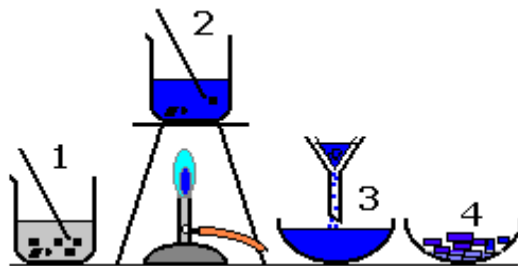
Electrolysis

What may they ask us about?

- How could you test the gas that is produced (*hydrogen = pop, chlorine = bleaches damp litmus paper*).
- What happens when the Ions get to the Electrode? (*positive ions are reduced – gain electrons. Negative ions are oxidised – lose electrons*).
- What would happen if you added universal indicator to the solution? (*turns purple – hydroxide is produced – alkali*).

Acid + Metal Oxide

- Excess of metal oxide added
- Need to heat the solution to ensure as acid fully reacts with available metal oxide particles
- Then filter to remove Excess metal oxide



What may they ask us about?

- How do you get solid crystals from the salt solution (*crystallize, evaporate the water*)
- Why do we heat the solution
- What are the risks and safety precautions
- Why do we filter the solution
- How could we test the pH of the salt solution?
- Name the salt produced.

Preparation
of a dry
sample of a
soluble salt

Required
practicals

Titration required practical (triple Only)

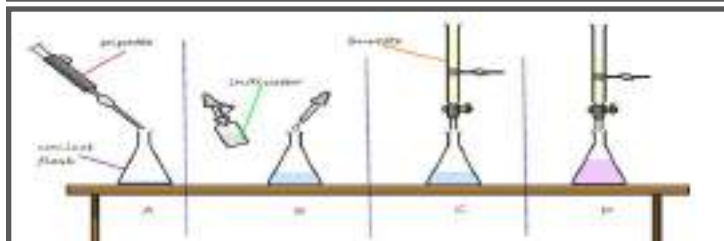
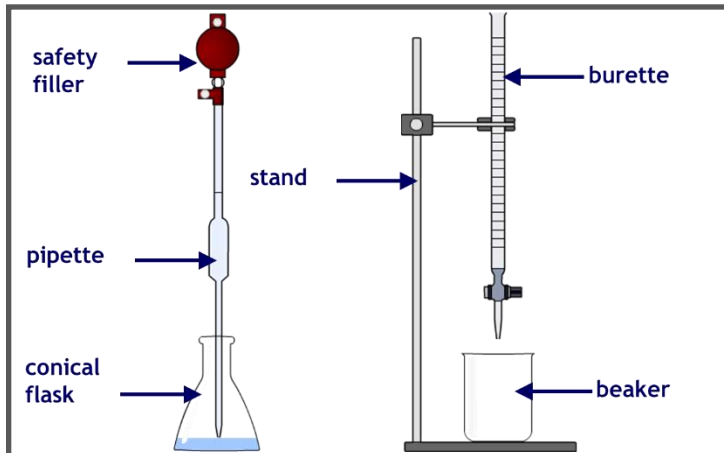
135

Titration

Titration is used to measure accurately what volumes of acid and alkali react together completely

Method for Titration

- Use the pipette and pipette filler to add 25cm³ of **known** (acid or alkali) to a clean conical flask.
- Add a few drops of *Indicator* and put the conical flask on a white tile (so you can see the colour change more easily)
- Fill the burette with **Unknown** (acid or alkali) note the starting volume.
- Slowly add the acid from the burette to the alkali in the conical flask, swirling to mix.
- Stop adding the acid when the end-point is reached (appropriate colour change in the indicator happens). Note the final volume reading.
- Repeat steps 1 to 5 until you get **concordant results**.



Choice of indicator

Depends on what is the unknown. Usually the alkali, but can be the acid. Unknown goes in the conical flask and known goes in the burette.

Titration Calculation (see C3)

Using the results from the titration the concentration of an **Unknown Acid or Alkali**.

Step 1 – Write a balanced equation
(This demonstrates the **mole ratio**)

Step 2 – Create a table for the following Concentration:

Volume (dm³)

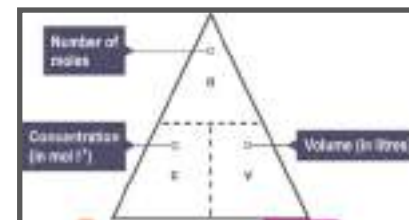
Moles

Ratio

Step 3 – Fill in table with information on knowns and results.

Step 4 – Use $n = c \times V$

Step 5 – Highlight the correct answer at the end of the steps, and use correct units



Indicator	ACID	ALKALI
Phenolphthalein	Colourless	PINK
Litmus	Red	Blue
Methyl Orange	Red	Yellow

End volume (cm ³)	start volume (cm ³)	Titre (cm ³)
26.00	0.00	26.00 (rough)
24.90	0.00	24.90
49.85	24.90	24.95

Must be to two d.p

Final dp can only be 0 (on the line) or 5 (between the lines)

Concordant Result = 0.1cm³ of each other

Exothermic vs Exothermic

Exothermic

In some reactions more energy comes OUT than goes in



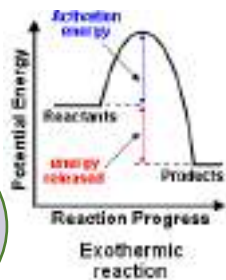
The reactants have more energy than the products.

e.g. combustion, oxidation, neutralisation.

Self heating cans, hand warmers

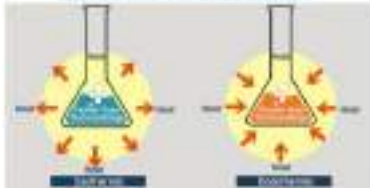


Temperature increases on thermometer as surroundings get warmer



Products at LOWER energy than reactants

Exothermic Vs. Endothermic



Endothermic

C5 Energy Changes

In some reactions more energy goes IN than comes out.

The products have more energy than the reactants.

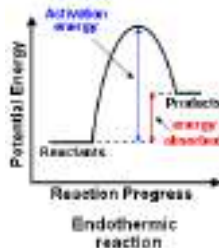


e.g. thermal decomposition

Cool packs for sports injuries



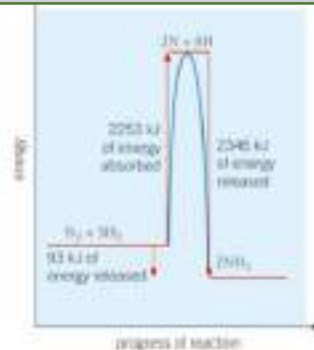
Temperature decreases on thermometer as surroundings get cooler



Products at HIGHER energy than reactants

Bond energy Calculations (HT)

Activation Energy is the energy needed to start a reaction.



BINMIX
Bond Breaking Is eNdothermic
Bond Making Is eXothermic

BENDO – breaking endothermic
MEXO making bonds exothermic

Exothermic

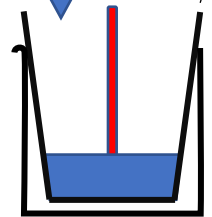
More energy comes OUT making bonds

More energy goes IN breaking bonds

Endothermic

Temperature change required practical

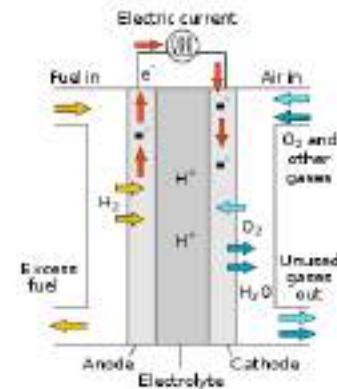
- 30 cm³ acid (measuring cylinder)
- Stir until temperature stops changing – record temperature
- 5cm³ alkali
- Repeat
- Repeat until a total of 40cm³ alkali is added





C5 Energy Changes Triple extra content

Hydrogen fuel cells

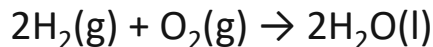


Chemical cells convert **chemical energy** in to **electrical energy**.

The cell voltage depends on the reactivity of the two chemicals connected and the electrolyte used.

The greater the difference in reactivity the greater the voltage.

Hydrogen + Oxygen → water



Electrode half equations - Higher

At the negative electrode: $2\text{H}_2 + 4\text{OH}^- \rightarrow 4\text{H}_2\text{O} + 4\text{e}^-$

At the positive electrode: $\text{O}_2 + 2\text{H}_2\text{O} + 4\text{e}^- \rightarrow 4\text{OH}^-$

Advantages

Continual voltage provided there is continual supply of oxygen and hydrogen

Only waste product is water – no direct pollution

No moving parts and small size

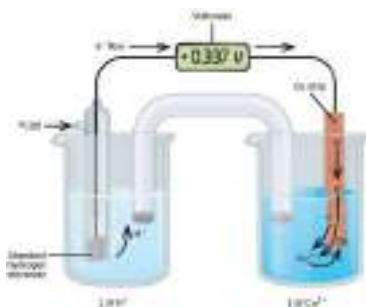
disadvantages

Hydrogen often generated by use of fossil fuels

Expensive to manufacture

Hydrogen is flammable and hard to store

Electrode A	Electrode B	Voltage (V)
Copper	Copper	0.00
Copper	Iron	0.78
Copper	Magnesium	2.71
Copper	Tin	0.48



Cell = 1

Battery = 2 or more cells connected in series e.g. car battery is 6 2V cells

Rechargeable cells - can be used many times as the chemical reaction can be reversed when an external current is supplied. They are made from precious metals (which can be recycled) and can overheat if not used correctly



Non - Rechargeable cells – alkaline cells are cheap to make– the chemical reaction continues in the cell until all the reactants are used up – the cell is then ‘flat’. The metals could be recycled, but this is costly

The Periodic Table of Elements

1		2												3	4	5	6	7	0
		Key relative atomic mass atomic symbol name atomic (proton) number										1 H hydrogen 1							4 He helium 2
7 Li lithium 3	9 Be beryllium 4											11 B boron 5	12 C carbon 6	14 N nitrogen 7	16 O oxygen 8	19 F fluorine 9	20 Ne neon 10		
23 Na sodium 11	24 Mg magnesium 12											27 Al aluminium 13	28 Si silicon 14	31 P phosphorus 15	32 S sulfur 16	35.5 Cl chlorine 17	40 Ar argon 18		
39 K potassium 19	40 Ca calcium 20	45 Sc scandium 21	48 Ti titanium 22	51 V vanadium 23	52 Cr chromium 24	55 Mn manganese 25	56 Fe iron 26	59 Co cobalt 27	59 Ni nickel 28	63.5 Cu copper 29	65 Zn zinc 30	70 Ga gallium 31	73 Ge germanium 32	75 As arsenic 33	79 Se selenium 34	80 Br bromine 35	84 Kr krypton 36		
85 Rb rubidium 37	88 Sr strontium 38	89 Y yttrium 39	91 Zr zirconium 40	93 Nb niobium 41	96 Mo molybdenum 42	[98] Tc technetium 43	101 Ru ruthenium 44	103 Rh rhodium 45	106 Pd palladium 46	108 Ag silver 47	112 Cd cadmium 48	115 In indium 49	119 Sn tin 50	122 Sb antimony 51	128 Te tellurium 52	127 I iodine 53	131 Xe xenon 54		
133 Cs caesium 55	137 Ba barium 56	139 La* lanthanum 57	178 Hf hafnium 72	181 Ta tantalum 73	184 W tungsten 74	186 Re rhenium 75	190 Os osmium 76	192 Ir iridium 77	195 Pt platinum 78	197 Au gold 79	201 Hg mercury 80	204 Tl thallium 81	207 Pb lead 82	209 Bi bismuth 83	[209] Po polonium 84	[210] At astatine 85	[222] Rn radon 86		
[223] Fr francium 87	[226] Ra radium 88	[227] Ac* actinium 89	[261] Rf rutherfordium 104	[262] Db dubnium 105	[266] Sg seaborgium 106	[264] Bh bohrium 107	[277] Hs hassium 108	[268] Mt meitnerium 109	[271] Ds darmstadtium 110	[272] Rg roentgenium 111	[285] Cn copernicium 112	[286] Nh nihonium 113	[289] Fl flerovium 114	[289] Mc moscovium 115	[293] Lv livermorium 116	[294] Ts tennessine 117	[294] Og oganesson 118		

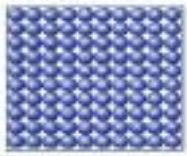
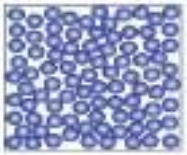
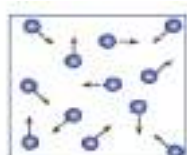
* The Lanthanides (atomic numbers 58 – 71) and the Actinides (atomic numbers 90 – 103) have been omitted.

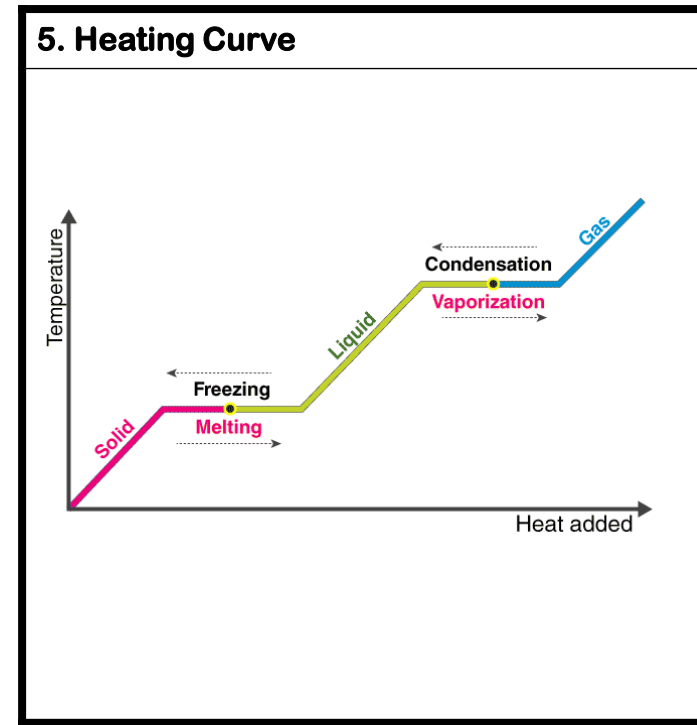
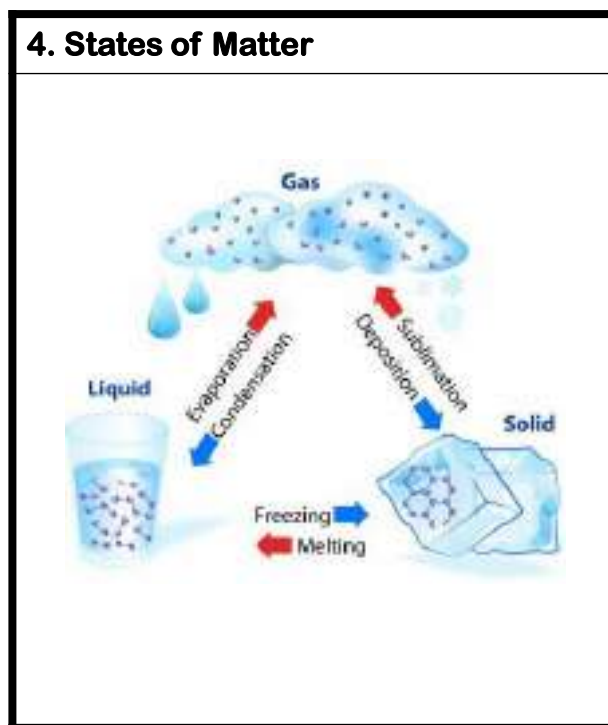
Relative atomic masses for **Cu** and **Cl** have not been rounded to the nearest whole number.

AQA Physics Knowledge Organiser – 3 Particle Model

1. Key Terms	
Anomalous	A result that does not fit the pattern.
Internal energy	Energy stored within a system.
Melting	Turning a solid to a liquid.
Freezing	Turning a liquid to a solid.
Evaporation or boiling	Turning a liquid to a gas.
Condensation	Turning a gas to a liquid.
Sublimation	Turning a solid directly to a gas.
Density	Mass per unit volume.

2. Equations	
Density (To learn)	Density = Mass ÷ Volume $(\text{kg/m}^3) = (\text{kg}) \div (\text{m}^3)$ $\rho = m \div V$
Thermal Energy (Given)	change in thermal energy = mass x specific heat capacity x temperature change $(\text{J}) = (\text{kg}) \times (\text{J/kg } ^\circ\text{C}) \times (^\circ\text{C})$ $\Delta E = mc\Delta\theta$
Change of State (Given)	energy required = mass x specific latent heat $(\text{J}) = (\text{kg}) \times (\text{J/kg})$ $E = mL$
Work Done (To learn)	Work Done = Force applied x Distance moved $(\text{J}) / (\text{N/m}) = (\text{N}) \times (\text{m}).$ $W = F s$

3. Solids, Liquids and Gases			
	Arrangement	Movement	Diagram
Solid	Close Together Regular Pattern Fixed Shape and Volume	Vibrate on the spot	
Liquid	Close Together Random Pattern No fixed shape Fixed Volume	Move around each other	
Gas	Far Apart Random Arrangement No fixed shape or volume	Move quickly in all directions	

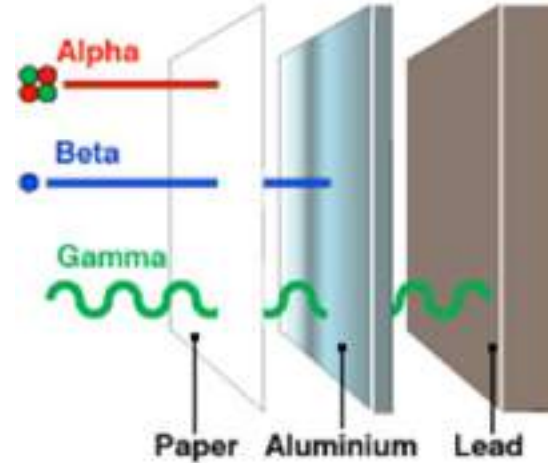


AQA Physics Knowledge Organiser – 4 Atomic Structure and Radiation

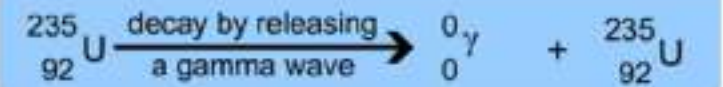
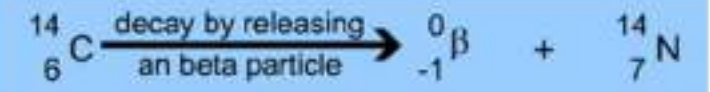
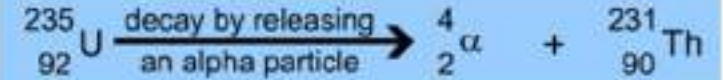
1. Keywords

Proton	A positively charged particle found in the nucleus of an atom.
Neutron	A neutral particle found in the nucleus of an atom
Electron	Negatively charged particles found on energy levels (shells) surrounding the nucleus inside atoms.
Mass number	Number of protons in an atom
Atomic number	Number of protons plus neutrons in an atom.
Isotope	Atoms with the same number of protons but a different number of neutrons.
Alpha particle	A particle formed from two protons and two neutrons.
Beta particle	A fast moving electron.
Gamma ray	An electromagnetic wave.

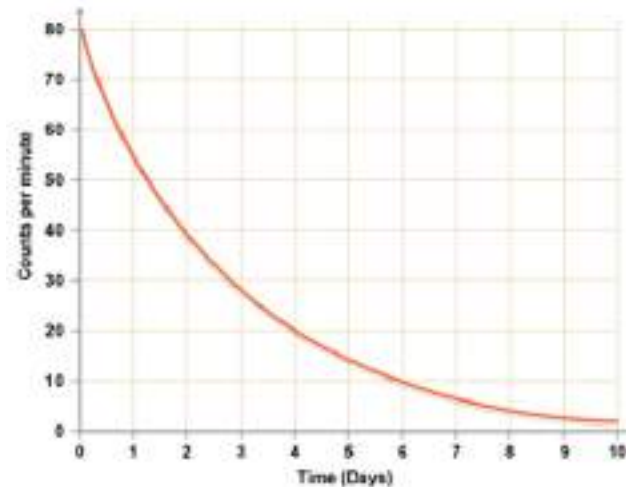
2. Penetrating power



3. Decay equations



4. Half-life



Half-life – the time taken for the count rate to fall to half its original amount.

For the graph shown – original count rate = 80.

Half of 80 = 40

Time taken to fall to 40 = 2 days

Half life of sample = 2 days.

Half life is different for different radioactive isotopes.

¡Qué rico!

Adjectives of nationality do not start with a capital letter in Spanish, unlike countries, which do.

Like all adjectives, they must agree with the noun.

Adjectives of nationality ending in a vowel usually follow the regular pattern:

chileno	chilena	chilenos	chilenas
---------	---------	----------	----------

Those ending in a consonant follow an irregular pattern.

ending in -l	español	español	españoles	españolas
ending in -s	inglés	inglesa	ingleses	inglesas

Adjectives of nationality can be used to form nouns: los españoles – Spanish people

Page 92

- **ch** is pronounced like the 'ch' in 'chat'.
- **r** is a soft 'r' pronounced by lightly touching your tongue against the back of your front teeth.
- **rr** (or **r** at the start of a word) has a stronger, rolled sound – a bit like an engine revving!
- **ce** and **ci** are pronounced like the 'th' in 'think' in most of Spain.
- **ca**, **co** and **cu** are pronounced like a 'k', similar to the English word 'cake'.

¡Qué rico! (pages 80–81):

Para... el desayuno / la comida la merienda / la cena	For... breakfast / lunch afternoon snack / dinner
una comida típica un plato popular	a typical meal a popular dish
¿De qué país es cada plato? El/La... es de... Los/Las... son de... México / España / Perú Chile / Argentina / Cuba	What country is each dish from? – is from... – are from... Mexico / Spain / Peru Chile / Argentina / Cuba
argentino/a / chileno/a colombiano/a / cubano/a español(a) / inglés/inglesa mexicano/a / peruano/a venezolano/a	Argentinian / Chilean Colombian / Cuban Spanish / English Mexican / Peruvian Venezuelan
¿En qué consiste(n)? Está hecho/a con...	What is it / are they made of? It is made with...

Están hechas/las con... Consiste(n) en... verdura/carne/pollo pescado/arroz	They are made with... It consists / They consist of... vegetables/meat/chicken fish/rice
¿Qué comida o bebida te gustaría probar? Me gustaría probar (la paella).	What food or drink would you like to try? I would like to try (paella).
¿Por qué te gustaría probarla/la/los/las? Porque... parece/suena rico/a me gusta(n)... es (muy) sano/a. tiene muchos beneficios para la salud.	Why would you like to try it/them? Because... it looks/sounds tasty I like it is (very) healthy. it has lots of health benefits.
¡A comer! ¡Buen provecho!	Let's eat! Enjoy your meal!

1 ¡Llevas una vida sana!

The verb **tener** (to have) is sometimes used with a noun where English uses the verb 'to be':

Tengo mucha hambre. I am very hungry

Tengo sed. I am thirsty.

Tienes razón. You are right.

Tener cuidado. To be careful.

Use **a + la/las** + time to say what time you do something.

Me levanto **a las** siete menos cuarto de la mañana.

I get up **at** quarter to seven in the morning.

Me acuesto **a las** diez y cuarto de la noche.

I go to bed **at** quarter past ten at night.

Use **tomar el desayuno / el almuerzo / la cena** for 'to have breakfast/lunch/dinner'.

G

The expressions **después de** and **antes de** can be followed by a verb or a noun. When followed by a verb, use the infinitive:

Antes de comer Before eating
Después de terminar After finishing

For reflexive verbs, add the correct **reflexive pronoun** to the infinitive:

Antes de vestirme Before getting (**myself**) dressed
Después de lavarte After washing (**yourself**)

When followed by a masculine singular noun, remember that **de + el = del**.

Después **del** desayuno After breakfast
Antes de la cena Before dinner

Page 92

G

Like all adjectives, **indefinite adjectives** agree in number and gender with the noun they modify, except **cada**, which is invariable. They always come before the noun.

algunos/as (some) **muchos/as** (many/a lot of)
mismos/as (same) **demasiados/as** (too many)
otros/as (other) **todos/as** (all/every)

Todos/as is followed by **los/las**.

Hago ejercicio **todos los días**. I exercise **every day**.

Page 93

Siempre / A veces / Nunca	me levanto	tarde.
Todos los días / Algunos fines de semana	me acuesto	temprano.
Todas las tardes / Algunas noches	como	a las [nueve].
Primero / Luego	tomo el desayuno	a la misma hora.
Durante la semana	tomo la merienda	
Finalmente	tomo la cena	
	hago deporte	
Antes de	tomo	demasiadas bebidas con azúcar.
Después de	como	[mucho] agua.
	bebo	algunos/muchos pasteles.
Si tengo hambre,		algunas/muchas verduras.
Si tengo sed,		chocolate/fruta/pasta.

Always / Sometimes / Never	I get up
Every day / Some weekends	I go to bed
Every afternoon (evening) / Some nights	I eat
	late
	early

First / Then (next)	I have breakfast
During the week	I have (tea-time)snack at 9.00
Finally	I have evening meal at the same time I do sport ⁴³
Before	getting up
After	having breakfast eating / drinking finishing classes returning home
If I am hungry	I have I eat I drink
If I am thirsty	too many sugary drinks a lot of water some / a lot of cakes some / a lot of veg chocolate / fruit / pasta



Remember that:

- some present tense verbs are irregular in the first person:
tener → tengo estar → estoy
- you have to change the **pronoun** and **ending** in reflexive verbs:
se levanta → **me levanto**
- you have to change **possessive adjectives**:
su casa → **mi casa**

¿Llevas una vida sana? (pages 82–83):

¿Cómo es tu *rutina?	What is your routine (like)?
Por la mañana/tarde/noche ...	In the morning/afternoon/night ...
Durante el día/la semana ...	During the day/week ...
El fin de semana ...	At the weekend ...
Los domingos ...	On Sundays ...
todos los días / fines de semana	every day / weekend
algunos días / fines de semana	some days/weekends
Primero / Luego ...	First / Later/Afterwards ...
Finalmente ...	Finally ...
Antes de / Después de ...	Before / After ...
hacer las deberes	doing homework
levantarme / vestirme	getting up / getting dressed
terminar los clases	finishing classes
tomar el desayuno	having breakfast
volver a casa / acostarme	returning home / going to bed
¿Qué costumbres sanas tienes?	What healthy habits do you have?
Duermo (bien) / *entreno	I sleep (well) / I train
Hago diez minutos de ejercicio.	I do ten minutes of exercise.

Llevo una botella de agua.	I carry a bottle of water.
Me levanto / Me acuesto ...	I get up / I go to bed ...
a las ... / a la misma hora	at ... (o'clock) / at the same time
tarde / temprano	late / early
Tomo un descanso / Me relajo	I have a rest / I relax
Suelo comer / hacer	I usually eat / do meditation
*meditación	
Tengo / Tienes / Tiene ...	I am / you are / he/she is ...
sed/hambre	thirsty/hungry
sueño/calor	sleepy/hot
¿Tienes costumbres malas?	Do you have any unhealthy habits?
Si tengo hambre/sed, ...	If I'm hungry/thirsty, ...
tomo / como / bebo ...	I have / eat / drink ...
mucha agua	lots of water.
algunos/muchos *dulces.	some/lots of sweets.
algunas/muchas verduras	some/lots of vegetables.
chocolate/fruta/pasta.	chocolate/fruit/pasta.

2 ¿Somos lo que comemos?

la comida callejera	street food
el puesto de comida	food stall
el asado de carne	roast meat

Direct object pronouns replace the noun that has already been mentioned and avoid repetition. The pronoun agrees with the noun it replaces.

English	Spanish
me	me
you (singular)	te
him/her/it	lo/la
us	nos
you (plural)	os
them	los/las

Direct object pronouns:

- go before a conjugated verb.
Lo comen. They eat **it**.
- go after a negative word.
No la toman. They don't have **it**.
- are attached to the end of an infinitive.
Te **recomiendo probarlos**.
I recommend you **try them**.

Page 94

¿Somos lo que comemos? (pages 84–85):

¿A qué hora tomas... el desayuno/almuerzo? la merienda/cena?	What time do you have... breakfast/lunch? afternoon snack/dinner?
Normalmente/Generalmente lo/la tomo... entre las... y las... A veces como a las...	Normally/Generally I have it... between... and... Sometimes I eat at...
¿Te gustaría probarlos/las?	Would you like to try them?
Te recomiendo... Hay que probar... Es un postre / una bebida... rica/a / típico/a	I recommend... You have to try... it is a... dessert/drink... tasty/typical
Me gustaría probarlo/la/ probarlos/las ... porque parece/suena ... porque parecen/suenan ...	I would like to try it/them... because it looks/sounds... because they look/sound...

3 ¡Los tiempos cambian!

To identify correct statements, look at each one and decide whether:

- it gives information that doesn't quite match what you hear (not correct!)
- it is talking about something which is simply not mentioned (not correct!)

These **impersonal verbs** are followed by the **infinitive**:

hay que you/one must
se necesita you/one needs
hace falta you/one needs to
Hay que **tener una dieta equilibrada**.

One must **have a balanced diet**.

Page 94

¿Cómo es tu dieta? (No) Tengo una dieta sana porque... soy vegano/a / vegetariano/a como café/da sano/malsano como dulces / pastelitos	What is your diet like? I (don't) have a healthy diet because... I am vegan / vegetarian I eat healthy/unhealthy food I eat too many sweets/cakes
---	--

¿Qué hay que hacer para tener una dieta sana?
Hay que / Se necesita...
Hace falta...

comer una dieta equilibrada
tener **cuidado** con la cantidad
de azúcar que tomas

What do you have to do to have a healthy diet?
You have to / need to...
It is necessary to...
eat a balanced diet
be careful with the amount
of sugar you have

Use **ya no + verb** to talk about what you no longer do or what no longer happens.

Ya no como comida malsana. I no longer eat unhealthy food.

You have already seen the **imperfect tense** for describing things in the past. It is also used for saying what you used to do.

Antes **me acostaba** tarde. Before I used to go to bed late.

	jugar (to play)	comer (to eat)	salir (to go out)
(yo)	jugaba	comía	salía
(tú)	jugabas	comías	salías
(él/ella/usted)	jugaba	comía	salía
(nosotros/as)	jugábamos	comíamos	salíamos
(vosotros/as)	jugabais	comíais	salíais
(ellos/ellas/ustedes)	jugaban	comían	salían

-er/ -ir verbs have the same endings.

Reflexive verbs follow the pattern in the table above: **me levantaba**



Only three verbs are irregular in the imperfect tense:

ser (to be) → **era, eras**, etc.

ir (to go) → **iba, ibas**, etc.

ver (to see/watch) → **veía, veías**, etc.

Antes	(no) me levantaba/acostaba	temprano/tarde.	early / late
Before	(no) tenía una dieta	sana/malsana.	healthy / unhealthy
	(no) comía comida	sana/malsana.	healthy / unhealthy
Cuando	(no) hacía	(mucho/suficiente) ejercicio/deporte.	
	(no) tenía	(mucho) energía.	
When	(no) dormía	bien/mal.	well / badly
	(no) jugaba/iba/veía ...	Used to sleep	
Sin embargo, ahora	me levanto/acuesto ...	Used to play / go / see	
	(ya no) tengo una dieta ...	I get up / go to bed	
Por el contrario, ahora	(ya no) como comida ...	I (no longer) have a ...diet	
	(no) haga (mucho/suficiente) ...	eat food	
On the contrary	(no) tengo (mucho) energía.	I (don't) do (much/enough)	
	(ya no) duermo ...	I (don't) have (much) energy	
(quite the opposite) now	(ya no) juego/voy/veo ...	(I no longer) sleep	
		(I no longer) play / go / see	

¡Los tiempos cambian! (pages 86–87):

¿Cómo eras antes? What were you like before?
 Cuando era pequeño/a... When I was little
 Cuando era más joven... When I was younger...
 Antes / Cuando tenía ... años, ... Before / When I was ... years old, ...
 dormía bien/mal I slept well/badly
 me levantaba / me acostaba ... I got up / I went to bed ...
 temprano/pronto / tarde early / late
 (no) era muy activo/a. I was (not) very active.
 (no) tenía ... I had / I didn't have ...
 (mucha) energía (lots of) energy
 una vida sana a healthy life
 (nunca) iba al gimnasio I (never) went to the gym

¿Qué te gustaba comer y beber? What did you like to eat and drink?
 Solía comer / beber ... I usually ate / drank ...
 (No) Comía ... I ate / I didn't eat ...
 Bebía demasiado café. I drank too much coffee.
 Me encantaban las postres. I loved desserts.
 Me gustaba comer *dulces. I liked eating sweets.

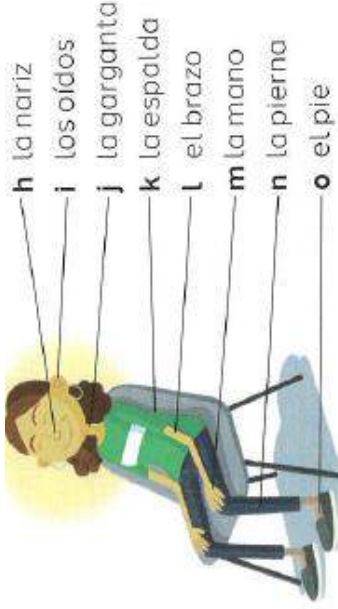
¿Qué hacías en tu tiempo libre cuando eras pequeño/a? What did you do in your free time when you were little?
 (No) Hacía (mucho/suficiente) ejercicio/deporte. I did / didn't do (lots of/enough) exercise/sports.
 (No) Iba a la piscina (tres veces a la semana). I went / didn't go to the pool (three times a week).
 (No) Montaba en *bici (cada día). I rode / didn't ride my bike (every day).
 (No) Jugaba ... I played / didn't play ...

(Siempre) Estaba cansado/a y enfermo/a. I was (always) tired and sick.
 ¿Cómo es tu *rutina ahora? What is your routine like now?
 Cuido más mi dieta. I look after my diet more.
 ¿Cómo eres ahora? What are you like now?
 Me siento mucho mejor. I feel a lot better.
 Soy bastante activo/a. I am quite active.
 No / Ya no ... I don't / no longer ...
 hago (mucho) ejercicio/deporte do (lots of) exercise/sports
 hago nada para mantenerme en forma do anything to stay in shape
 me levanto temprano como antes get up early like before

¿Qué te gusta comer y beber? What do you like to eat and drink?
 (No) Como comida rápida/malsana. I (don't) eat fast/unhealthy food.
 (Ya no) Bebo/Como ... I (no longer) eat/drink ...
 Prefiero las bebidas con azúcar. I prefer sugary drinks.
 Me gusta comer comida sana. I like to eat healthy food.

¿Qué haces en tu tiempo libre? What do you do in your free time?
 (No) Hago ejercicio/deporte. I (don't) do exercise/sports.
 (No) Voy al gimnasio/cine. I (don't) go to the gym/cinema.
 (No) Juego a *los videojuegos. I (don't) play videogames.

4 ¡Qué mal estoy!



G

Doler (to hurt) is a stem-changing verb. It works like **gustar**.
Me duele la espalda. My back hurts.
Te duelen los pies. Your feet hurt.
 A mi hermano **le duelen** los oídos. My brother has earache.
 Use **tengo dolor de** followed by the part of the body that hurts. **Don't** use the definite article.
Tengo dolor de espalda. My back hurts. / I have pain in my back.

G

Use the **preterite tense** to say what happened to you.
 For reflexive verbs such as **romperse**, **quemarse** and **cortarse**, put the correct reflexive pronoun before the verb and use the **definite article**.
 In English we say 'my leg', but Spanish uses 'the leg'.
Me rompí el brazo. I broke **my** arm.
 With **caerse** you have to use a **preposition**.
 La semana pasada me **caí de** la bici.
 Me **caí en** el parque.

Debes

You must

Tienes que

You have to...

También necesitas

Also you need to...

descansar y recuperarte.
ir al médico/hospital/dentista.
comprar medicinas en la farmacia.
quedarte en la cama.
beber/tomar agua.
evitar el sol.
relajarte/dormir.

Rest and recuperate
Go to the Dr /hospital/dentist
Buy medicines in the pharmacy
Stay in bed
Drink / eat something
Avoid the sun
Relax / sleep

Listen and repeat the sounds and words.

ca – caí, descansar, cabeza

co – comidas, médico, cómoda

cu – recuperarte

cu + vowel – cuerpo, cuidar, cuidado

Estoy enfermo/a

Me siento mal

No me siento bien

Me / Te / Le

porque
tengo

duele(n)

Ayer

La semana pasada

me rompí
me quemé
me corté

Me caí

de la bici / en el parque / en la calle.

fiebre.

dolor de [cabeza].

una herida [en los pies].

[el estómago].

[los oídos].

Ayer

La semana pasada

el brazo/dedo.
la pierna/piel.

I am ill

I feel ill (bad)

I don't feel well

My

Yesterday

Last week

I fell

Because

I have

Stomach
ears

I broke
I burnt
I cut

Off my bike / in the park

A temperature / fever

A head ache

A wound (on my feet)

Hurt(s) me / you / him or her

My arm / finger
My leg / skin

In the street

¿Desde cuándo?

Since when?

ayer / esta mañana/tarde.

la semana pasada.

el [sábado] pasado.

el fin de semana pasado.

Desde

Since

yesterday / this morning / p.m.

last week

last (Saturday)

last weekend

¿Desde hace cuánto tiempo?

un día.

Desde hace una hora/semana.
más de [dos días].

For

For how long?

A day

An hour / week

More than (2 days)

¡Qué mal estoy! (pages 88-89):

¿Qué te pasa?

What's the matter with you?

Me / te / le duele(n) ...

My / your / his/her ... hurt(s)

el brazo / el estómago

arm / stomach

el pie / la boca / la mano

foot / mouth / hand

la cabeza / la espalda

head / back

la garganta / la nariz

throat / nose

la rodilla / la pierna

knee / leg

los ojos / las ojas / los dedos

ears / eyes / fingers

los dientes / (todo) el cuerpo

teeth / (whole) body

Estoy (muy) enfermo/a

I am (very) sick

Me siento (muy) mal.

I feel (very) unwell.

No me siento bien porque

I don't feel well because

tengo ...

I have ...

fiebre / dolor de cabeza

a fever / a headache

una herida

an injury

Ayer / La semana pasada ...

Yesterday / Last week ...

me rompí / me caí ...

I broke my / I cut my ...

me quemé ...

I burned my ...

la pierna/piel

leg/skin

¿Desde cuándo estás así?

Since when have you been like this?

desde (ayer)

since (yesterday)

desde hace una hora / más de (dos días)

for an hour / more than (two days)

Debes / Necesitas ...

You must / You need to ...

Tienes que

You have to ...

quebarte en la cama / en caso de descansar/dormir

stay in bed / at home rest/sleep

comprar medicinas (en la farmacia)

buy medicine (at the chemist's)

evitar el sol

avoid the sun

recuperarte/relajarte

recover/relax

ir al médico/hospital

go to the doctor's/hospital

Voy a pedir cita con el médico.

I am going to ask for a doctor's appointment.

5 Mi salud, de la cabeza a los pies

Use the **simple future tense** to say what you will do or what will happen.

To form the simple future, add the following endings to the infinitive:

	evitar (to avoid)
(yo)	evitaré
(tú)	evitarás
(él/ella/usted)	evitará
(nosotros/as)	evitaremos
(vosotros/as)	evitaréis
(ellos/ellas/ustedes)	evitarán

The simple future tense is also used in 'if' clauses to say what will happen.

Si + **present** + **future**.

Si me acuesto más pronto, **no estaré cansado/a** al día siguiente.

If I go to bed earlier, I **will not be** tired the next day.

Some verbs have an **irregular stem** in the simple future. They include:

tener → **tendré** (I will have)
 poner → **pondré** (I will put)
 venir → **vendré** (I will come)
 hacer → **haré** (I will do/make)
 decir → **díré** (I will say)
 poder → **podré** (I will be able to)
 salir → **saldré** (I will go out)
 saber → **sabré** (I will know)
 querer → **querré** (I will want)

Mi salud, de la cabeza a los pies (pages 90–91):

¿Cómo cambiarás tu estilo de vida? How will you change your lifestyle?
 Si dejas de comer/beber/fumar... If I stop eating/drinking/smoking,
 Si duermo (al menos ocho horas)... If I sleep (at least eight hours)...
 Si practico más deporte... If I practise more sport...
 Si tengo (una vida más activa)... If I have (a more active life)...
me sentiré más feliz I will be happier
 mi salud física/mental will improve
 mejorará
 dormiré mejor I will sleep better
 me levantaré con más energía I will wake up with more energy

¿Qué harás para mejorar tu salud en el futuro? What will you do to improve your health in the future?
 Para cambiar este mala costumbre... To change this bad habit...
 Para mejorar mi dieta/salud... To improve my diet/health...
 dormiré más tiempo / beberé agua I will sleep longer / I will drink water
 no usaré el móvil (después de las nueve) I won't use my mobile (after nine o'clock)
 iré (al gimnasio) I will go (to the gym)
 evitaré beber alcohol, y fumar I will avoid drinking alcohol and smoking
 empezaré a practicar deporte I will start practising sport

Gramática

Remember that:

- the **present tense** is used to talk about what you normally do: como, tengo, voy ...
- the **imperfect tense** is used to talk about what you used to do: estaba, tenía ...
- the **preterite tense** is used to talk about what you did in the past: empecé, dejé ...
- the **simple future tense** is used to talk about what you will do: iré, comeré ...

Page 95

singular		plural	
masculine	feminine	masculine	feminine
algún día	alguna vez	algunos sábados	algunas personas
otro deporte	otra comida	otros ejercicios	otras costumbres
el mismo lugar	la misma hora	los mismos intereses	las mismas cosas
demasiado tiempo	demasiada sal	demasiados exámenes	demasiadas fiestas
todo el día	toda la noche	todos los fines de semana	todas las semanas
mucha dinero	mucha suerte	muchos jóvenes	muchas escuelas

Cada (each) always stays the same. **Varios/Varias** (several) is only used in the plural.

Remember that **indefinite adjectives** always come before the noun.

Ningún/Ninguna is normally only used in the singular form, except for emphasis.

ningún día (not any day)

ninguna persona (nobody/not anyone)

No tengo **ningunas** ganas de ir.

I don't have any interest in going.

Adjectives of nationality can be used to form nouns by adding the **definite article**.

Los cubanos (Cubans)

Los ingleses (English people)

Antes de, después de + infinitive

Antes de ('before') and *después de* ('after') are followed by the infinitive form of the verb to mean 'before -ing' or 'after -ing'.

antes de visitar a mis abuelos
before visiting my grandparents

después de jugar al fútbol
after playing football

G The imperfect tense

> page 214

You have seen the **imperfect tense** for describing things in the past. It is also used for saying what you used to do.

Jugaba al baloncesto. He/She used to play basketball.

	jugar (to play)	hacer (to do/make)	vivir (to live)
(yo)	jugaba	hacía	vivía
(tú)	jugabas	hacías	vivías
(él/ella/usted)	jugaba	hacía	vivía
(nosotros/as)	jugábamos	hacíamos	vivíamos
(vosotros/as)	jugabais	hacíais	vivíais
(ellos/ellas/ustedes)	jugaban	hacían	vivían

Only three verbs are irregular in the imperfect. These are:

ser (to be) → *era, eras, etc.*

ir (to go) → *iba, ibas, etc.*

ver (to see / watch) → *veía, veías, etc.*



Remember to avoid repetition by using direct object pronouns: *lo/la/los/las*.

These usually come before the verb, but can be added to the end of an infinitive.

¿Cuándo ves la tele?

La veo por la noche.

but **Suelo verla** por la noche.

Challenge checklist

	<ul style="list-style-type: none"> ✓ Past, present and future time frames ✓ Connectives / time phrases / sequencers ✓ Extended sentences
	<ul style="list-style-type: none"> ✓ Longer sentences using a range of connectives (<i>donde, cuando, que, además, también</i>) ✓ <i>Ya no</i> + present to say what you no longer do (<i>ya no bebo refrescos ...</i>) ✓ A wider range of adjectives, e.g. <i>grave</i> (serious), <i>fundamental, absurdo, agradable</i> (pleasant)
	<ul style="list-style-type: none"> ✓ Other people's opinions (<i>pero mi familia prefiere ... mi amigo piensa que ...</i>) ✓ Direct object pronouns (<i>Me gustan las verduras. Las como todos los días ...</i>) ✓ Contrast between the imperfect and <i>pero ahora</i> + present to say what you now do

Y10/11 Spanish K.O: Mod 5 'La vida escolar en España'

iA clase!

Remember to use the correct word order and to make adjectives agree with the noun.

Llevo **una** **camisa** blanca y **unos** zapatos **negros**.

However, where a colour adjective is followed by **claro** (light) or **oscuro** (dark), the **masculine** singular form is used.

Llevo **una** **camisa** rojo **claro** y **unos** zapatos verde **oscuro**.

Estoy en ...	1 ^o (primero) de ESO.	1 ^o in Year
	2 ^o (segundo) de ESO.	8
	3 ^o (tercero) de ESO.	9
	4 ^o (cuarto) de ESO.	10
	1 ^o (primero) de Bachillerato.	11
	2 ^o (segundo) de Bachillerato.	12
		13

To say 'really [good]', 'extremely [expensive]', etc., use the **absolute superlative**.
 Add **-ísimo/a** to the end of the adjective, and make it agree.
 Es facil**ísimo/a**.
 It is **extremely easy**.
 If the adjective ends in a vowel, remove it before adding the ending.
 Son buen**ísimos/as**.
 They are **really good**.

bueno/a(s)	mal/a(s)
moderno/a(s)	viejo/a(s)
caro/a(s)	barato/a(s)
cómodo/a(s)	incómodo/a(s)
bonito/a(s)	feo/a(s)
divertido/a(s)	aburrido/a(s)
excelente(s)	decepcionante(s)

Good	bad
Modern	old
Expensive	cheap
Comfortable	uncomfortable
Pretty	ugly
Fun	boring
Excellent	disappointing

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

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

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

1 Un día en el insti

Voy al insti a pie / en (bic)í
 Las clases empiezan a las ...
 Las clases terminan a las ...
 Cada clase dura ...

I go to school s on foot / by bike
 Lessons start at .. O'clock
 Lessons end at ...
 Each lesson lasts...

G

Use the **relative pronouns**

que (that/which/who), **donde** (where) or **cuando** (when) to give more information about the noun you are talking about.

Voy con un amigo, **que** se llama Alex.

I go with my friend, **who** is called Alex.

Salgo al patio, **donde** juego al fútbol.

I go out to the playground, **where** I play football.

Page 116

In the present tense, some verbs are irregular in the 'I' form only.

They include:

hacer → **hago** (I do/make)

venir → **vengo** (I come)

poner → **pongo** (I put)

tener → **traigo** (I bring)

salir → **salgo** (I go out/leave)

conocer → **conozco** (I know/meet)

Soy miembro del club/equipo de ...		I'm a member of a ... club/team	
Llevo [tres] meses / [dos] años	asistiendo a ... jugando al / a la ... participando en ... tocando ...	I have been for 3 months 2 years	going to/attending... playing (sport) participating in... playing (instrument)
Te permite Te anima a Te ayuda a	aprender cosas nuevas. desarrollar tus talentos. hacer nuevos amigos. ser creativo/a.	It allows you to It encourages you to It helps you to	learn new things develop your talents make new friends be creative
Te da	la oportunidad de ... más confianza. un sentimiento de éxito.	It gives You	the opportunity/chance to... ore confidence a feeling of success
Te hace sentir orgulloso/a.		It makes you feel proud	

To say how long you have been doing something, use the present tense of

llevar + time period + the **present participle**.

Llevo dos años jugando al fútbol.

I've been playing football for two years.

You can also use the present tense of a verb + **desde hace** + time period.

Juego al fútbol **desde hace dos años.**

I've been playing football for two years.

G

Page 117

When translating into English, remember that some phrases do not translate word for word. Spanish often uses the word **de** to give more information about a noun.

- la hora **de** comer lunchtime
- el equipo **de** natación the swimming team
- el club **de** teatro the drama club

Un día en el insti (pages 106–107):

¿Cómo vas al instituto? Voy (al insti) ... a pie / en coche/tren en autobús/bici	How do you go to school? I go (to school) ... on foot / by car/train by bus/bike
¿Cómo es tu día escolar? Las clases empiezan/terminan a las ... Cada clase dura una hora. Hay un descanso a las ...	What is your school day like? Classes start/end at ... Each class lasts an hour. There is a break at ...
¿Qué sueles hacer a la hora de comer? Salgo al patio. Traigo un bocadillo. Voy a la biblioteca/cantina.	What do you usually do at lunchtime? I go out to the playground. I bring a sandwich. I go to the library/canteen.
¿Qué día de la semana prefieres? Prefiero los martes cuando tengo/tenemos ... actividades *extraescolares. todas mis asignaturas favoritas.	Which day of the week do you prefer? I prefer Tuesdays when I/we have ... extracurricular activities. all my favourite subjects.
¿Qué haces después del insti? Soy miembro de un club. Soy capitán/capitana del equipo. I am captain of the team.	What do you do after school? I am a member of a club. I am captain of the team.

Ayudo con la radio escolar. Toco en la orquesta.	I help with the school radio. I play in the orchestra.
¿Cuánto tiempo llevas...? Llevo/Llevamos dos años ... participando en el proyecto asistiendo a clases de baile jugando al voleibol	How long have you been ...? I/We have been ... for two years. participating in the project attending dance classes playing volleyball
¿Por qué te gusta esta actividad? Me encanta porque ... te ayuda a ... te da la oportunidad de ... te anima a ... / te permite ... aprender cosas nuevas desarrollar tus talentos hacer nuevos amigos ser *creativo/a te da ... más confianza un sentimiento de éxito te hace sentir orgulloso/a	Why do you like this activity? I love it because it... helps you to ... gives you the opportunity to ... encourages/follows you to ... learn new things develop your talents make new friends be creative gives you ... more confidence a sense of accomplishment makes you feel proud
¿Qué hiciste recientemente con el club/equipo? Organizamos una competición ... Hicimos un espectáculo de ... Acabo de ...	What did you do recently with the club/team? We organised a competition ... We did a ... show I have just ...

2 ¿Qué tal tus estudios?

Prefiero Odio Me encanta (No) Me gusta	el dibujo el español el inglés el teatro la geografía la historia	la informática la literatura la música la religión la educación física la tecnología	aburrido/a(s). complejo/a(s). complicado/a(s) difícil(es). divertido/a(s). duro/a(s) fácil(es). importante(s). imposible(s). interesante(s). pesado/a(s) práctico/a(s). útil(es)
	art	porque es	hard easy
Prefiero Odio Me encantan (No) Me gustan	los idiomas las ciencias las matemáticas	porque son	boring useful

Use **lo que** to mean 'what' when you are not asking a question.

Lo que más me gusta es ...

What I like most is ...

No entiendo **lo que** dice.

I don't understand **what** he/she says.

Page 117

Double letters cc, ll, nn, rr ONLY:-

The four consonants in the word

CaRoLiNa are the only ones that can be written as double letters in Spanish.

ab**rr**rido

Take extra care with cognates.

diff**ic**il impos**si**ble

The only exceptions are some words taken from other languages (e.g. el jazz).

But – el tennis

For verbs like **gustar**, **encantar** and **interesar**, change the **pronoun** according to who you are talking about.

me gusta(n) **nos** gusta(n)

te gusta(n) **os** gusta(n)

le gusta(n) **les** gusta(n)

Remember to use the word **a** with these verbs when mentioning another person and include the **definite article** (**el/la/los/las**) when giving an opinion of a noun.

A mi amigo le gusta **la** historia, pero no le gustan **las** ciencias.

My friend likes history, but he doesn't like science.

Page 117

Para ...
 aprobar mis exámenes, ...
 mejorar mi nivel, ...
 sacar buenas/mejores notas, ...
 tener éxito en la prueba, ...
 aprenderé de mis errores.
 asistiré a clases de repaso.
 participaré más en clase.
 pasaré más tiempo repasando.
 preguntaré al profe si no entiendo.

*To say I will do something add **é** to the infinitive. (Watch! Some verbs are irregular)

(In order) to...
 pass my exams
 improve my level
 get good grades/better grades
 have success (be successful) in the test
 I will learn from my mistakes
 I will attend / go to revision classes
 I will participate in class
 I will spend more time revising
 I will ask the teacher if I don't understand

<p>¿Qué tal tus estudios? (pages 108-109): ¿Cuál es tu asignatura favorita? Mi asignatura favorita es ... Lo que más/menos me gusta es ... Se me da(n) bien/mal ... el dibujo/teatro el español/inglés la geografía/historia la *literatura/música la religión/educación física</p>	<p>What is your favourite subject? My favourite subject is ... What I like the most/least is ... I am good/bad at ... Art/ Drama Spanish/English Geography/ History Literature/Music Religion/PE</p>	<p>la tecnología*/informática las ciencias/matemáticas los idiomas porque / ya que es/son ... aburrido/a(s) / difícil(es) divertido/a(s) / duro/a(s) fácil(es) / importante imposible(s) / interesante(s) útil(es) / práctico/a(s) complejo/a(s) pesado/a(s)</p>	<p>Technology/IT Sciences/Maths languages because it is / they are ... boring / difficult fun/amusing / hard easy / important impossible / interesting useful / practical complex annoying/boring</p>
<p>Me cuesta (mucho) ... Es difícil ... recordar todas las fechas resolver los problemas</p>	<p>I find it very difficult to ... It is difficult ... to remember all the dates to resolve problems.</p>	<p>Para sacar buenos/mejores notas, ... Para tener éxito en la prueba, ... aprenderé de mis errores participaré más en clase preguntaré al profesor si no entiendo pasaré más tiempo *repasando asistiré a clases de *repaso</p>	<p>To get good/better marks, ... To be successful in the test, ... I will learn from my mistakes I will participate more in class I will ask the teacher if I don't understand I will spend more time revising I will attend revision classes</p>
<p>¿Qué vas a hacer para tener éxito? Para aprobar mis exámenes, ... Para mejorar mi nivel, ...</p>	<p>What are you going to do to be successful? To pass my exams, ... To improve my level, ...</p>		

3 ¿Cómo cambiarías tu instituto?

G

These **impersonal verbs** are followed by the **infinitive**:

hay que	you/one must
(no) se debe	you/one must (not)
(no) se permite	you are (not) allowed to
está prohibido	it is forbidden (to)

No se debe comer en clase.
You mustn't eat in class.

Use the **conditional tense** to say what you would do.

You already know *me gustaría* (I would like).

To form the conditional, add the imperfect tense endings of **-er/-ir** verbs to the infinitive.

	cambiar (to change)
(yo)	cambiaría
(tú)	cambiarías
(él/ella/usted)	cambiaría
(nosotros/as)	cambiaríamos
(vosotros/as)	cambiaríais
(ellos/ellas/ustedes)	cambiarían

Cambiaría el uniforme.

I would change the uniform.

Some verbs have an **irregular stem** in both the simple future and conditional tense, including:

tener → **tendría** (I would have)

hacer → **haría** (I would do/make)

poder → **podría** (I would be able to / I could)

poner → **pondría** (I would put)

The conditional of *hay* (there is/are) is **habría** (there would be).

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

¿Qué harías para mejorar tu instituto?	What would you do to improve your school?
Mejoraría la calidad de la comida.	I would improve the quality of the food.
Reduciría el precio del uniforme.	I would reduce the price of the uniform.
Permitiría el uso de los móviles en clase.	I would allow the use of mobiles in class.
Construiría un nuevo gimnasio.	I would build a new gym.
Ofrecería más actividades *extraescolares.	I would offer more extracurricular activities.

tenemos que gastar dinero en ...	we have to spend money on ...
muchos alumnos ...	many students ...
tienen miedo / sufren *amenazas.	are scared / suffer threats
Hay que ...	You have to ...
llegar a tiempo	arrive on time
respetar a los alumnos/ profesores	respect students/teachers
mantener limpio el patio	keep the playground clean
quedarse sentado durante la clase	stay seated during class

¿Qué es lo malo de tu instituto?	What is the bad thing about your school?	No se debe ...	You must (not) ...
Lo malo de mi instituto es que ...	The bad thing about my school is that ...	No se permite / Está prohibido ...	You are (not) allowed to ...
Las instalaciones deportivas son viejas / están en mal estado	the sports facilities are old / are in a bad state	traer aparatos electrónicos personales	bring personal electronic devices
Las reglas son demasiado estrictas	the rules are too strict	tirar basura al suelo	throw rubbish on the floor
Los teléfonos están prohibidos	telephones are prohibited	comer/beber en *las aulas	eat/drink in classrooms
		ir al servicio sin *el permiso del profesor	go to the toilet without the teacher's permission
		(No) Estoy de acuerdo con esta norma porque ...	I (don't) agree with this rule because ...

4 La gente de mi insti

For 'yes/no' questions, simply use question marks (when writing) or correct intonation (when speaking) to turn the statement into a question.

Aprendes mucho en clase.

¿Aprendes mucho en clase?

You learn a lot in class.

Do you learn a lot in class?

Many **negative** expressions form a 'sandwich' around the verb:

No hago **nada**.

I **don't** do **anything**.

No escucho a **nadie**.

I **don't** listen to **anyone**.

No estudio **ni** dibujo **ni** teatro.

I **don't** study **either** art or drama.

No faltó a **ninguna** clase.

I **don't** miss **a single** lesson.

Nunca / **Jamás** (never) can go **before** or **after** the verb.

When used after, add **no** before the verb.

Nunca leo. / **No** leo **nunca**. I **never** read.

Tampoco (neither/nor) usually goes before the verb.

Tampoco repaso.

I **don't** revise **either**.

La gente de mi insti (pages 112–113):

¿Qué tipo de alumna eres? What type of student are you?

Soy muy/bastante/demasiado... I am very/quite/too ...

responsable / trabajador(a) responsible / hard-working
independiente / *perezoso/a independent / lazy

Tengo ganas de tener éxito. I am keen to be successful.

(No) Quiero / (No) Me gusta... I (don't) want / I (don't) like ...

aprender / aprobar to learn / to pass

estudiar / *reparar to study / to revise

¿Cómo te preparas para el How do you prepare for a

día escolar? school day?

(No/Nunca) Llego temprano / I (don't/never) arrive early /

a tiempo. on time.

¿Dónde sueles hacer (as Where do you usually do your

deberes? homework?)

Los hago en casa o en la I do it at home or in the library.

biblioteca.

No los hago **jamás** I never do it.

¿Aprendes mucho en clase? Do you learn a lot in class?

(No) Escucho al profe / a nadie. I (don't) listen to the teacher / to anyone.

(No) Hago todas **las tareas**. I (don't) do all the homework / usually ...

Suelo ... I usually ...

sacar buenas notas get good marks

recordar lo que necesito remember what I need

¿Cómo sería tu profesor(a) What would your ideal

*ideal? teacher be like?

Mi profesor(a) *ideal... My ideal teacher ...

haría mucho esfuerzo para ... would make a lot of effort to ...

no **gritaría** nada wouldn't shout at all

no **nos** pondría demasiados wouldn't give us too much

deberes homework

no sería demasiado estricto/a wouldn't be too strict

nos dejaría usar el móvil would let us use our mobile

nunca llegaría tarde a clase would never arrive late to class

tendría un buen **sentido** del would have a good sense of

humor humour

sería *comprensivo/a would be understanding

5 El viaje de fin de curso

Adverbs are used to say when, where or how something is done.

In English, many adverbs end in '-ly'.

In Spanish, add **-mente** to the **feminine** form of the adjective.

rápido → **rápida** → **rápidamente** (quickly)

normal → **normal** → **normalmente** (normally)



If the adjective has a written accent, the corresponding adverb does too. Compare the two examples above.



Some adverbs don't end in **-mente**. These include:

bien (well)

mal (badly)

mucho (a lot)

poco (a little)

aquí/acá (here)

allí/allá (there)

siempre (always)

a menudo (often)

Look out for '**false friends**' – words that look or sound like an English word but have a different meaning.

What do these words from the text in exercise 1 mean?

asistir

cola

emocionante

importar

largo

G

Adjectives must agree with the noun they are describing and usually follow the noun.

una bebida **a típica** a typical drink

Some adjectives come before the noun. These include:

mucho/a (much/a lot) **poco/a** (little/few)

próximo/a (next) **último/a** (last/latest)

Some adjectives have a shortened form when used before a **masculine** singular noun:

primero → **primer** **tercero** → **tercer** **alguno** → **algún**

bueno → **buen** **malo** → **mal** **ninguno** → **ningún**

The meaning of certain adjectives depends on their position:

el **único** problema (the **only** problem)

un lugar **único** (a **unique** place)

When used before a masculine or feminine singular noun, **grande** shortens to **gran** and means 'great'. When used after a noun, it means 'big' or 'large'.

una **gran** persona (a **great** person)

un museo **grande** (a **big** museum)

Page 119

Remember to use:

- the **preterite tense** to say what you did, what happened, what the weather was like and to give your opinion in the past.
- the **imperfect tense** to describe things in the past or say what something used to be like.

Try to use a variety of verb forms (e.g. I, he/she, we/they, etc).

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

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

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

To say 'really [good]', 'extremely [expensive]', use the **absolute superlative**.

Add **-ísimo/a** to the end of the adjective, and make it agree.

If the adjective ends in a vowel, remove it before adding the ending.

La historia es divertid**ísima**.

Los profes son buen**ísimos**.



Some adjectives have a spelling change to preserve the sound.

rico → *riqu**í**simo*

largo → *largu**í**simo*

Only the **-ísimo** part of the word has an accent:

difícil → *difícil**í**simo*



You can only use the absolute superlative if it would also make sense to use **muy** or **bastante** before the adjective.

grande ✓ *famoso* ✓ *difícil* ✓

favorito ✗ *tercero* ✗ *otro* ✗

Use **que** (that/which/who), **donde** (where) or **cuando** (when) to give more information about the noun you are talking about.

Voy con un amigo **que** se llama Ana.

Salgo al patio, **donde** juego al tenis.

Prefiero los días **cuando** tenemos teatro.

I go with a friend, **who** is called Ana.

I go out to the playground, **where** I play tennis.

I prefer days **when** we have drama.



You must use the word **que** even where it is optional in English.

Me encantó la película **que** vimos ayer. I loved the film (**that**) we saw yesterday.



Don't confuse relative pronouns with the question words (or 'interrogatives') **qué**, **dónde** and **cuándo**, which always have a written accent.

¿**Qué** haces con el dinero **que** recibes? **What** do you do with the money (**that**) you receive?

To say how long you have been doing something, use the present tense of **llevar** + time period + the **present participle**.
 ¿Cuánto tiempo **llevas esperando**?
 How long **have you been waiting**?

To form the present participle, remove the **-ar, -er** or **-ir** from the infinitive and add **-ando, -iendo, or -iendo**



Irregular present participles include:

leer → leyendo
 dormir → durmiendo
 servir → sirviendo



You can also use the present tense of a verb + **desde hace** + time period as an alternative. See page 107.

Use the **conditional tense** to say what you would do.
 To form the conditional, add the imperfect tense endings of **-er/-ir** verbs to the infinitive:

cambiar ía	I would change
cambiar ías	you (singular) would change
cambiar ía	he/she/it would change
cambiar íamos	we would change
cambiar íais	you (plural) would change
cambiar ían	they would change

Some verbs have an **irregular stem** in both the simple future and conditional tenses, but the endings are the same as for regular verbs:

decir → **diría** (I would say/tell)
 tener → **tendría** (I would have)
 hacer → **haría** (I would do/make)
 poder → **podría** (I would be able to / I could)
 poner → **pondría** (I would put)
 querer → **querría** (I would want)
 saber → **sabría** (I would know)
 salir → **saldría** (I would go out)
 venir → **vendría** (I would come)

The conditional of *hay* (there is/are – from the verb *haber*) is **habría** (there would be).