

Name and Tutor group:

THE  
CORSHAM  
SCHOOL  
WILTON WIMBORNE



# Year 10 Knowledge Organiser

## Term 4

### CORSHAM CHARACTER

#### INTELLECTUAL VALUES

The pursuit of truth,  
knowledge and  
understanding.

Be reflective. Be curious. Be  
open-minded. Be creative.



#### PERFORMANCE VALUES

Maximum effort, maximum  
focus.  
Be resilient. Always Persevere.  
Contribute to Teamwork.  
Be ambitious.



# DREAM BELIEVE ACHIEVE

Look, Cover,  
Write, Check

Definitions to  
key words

Flashcards

pictures

Stage 1

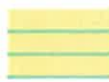
Look at & study an  
area of your  
knowledge organiser



Write down the key  
words & definitions



Write key words,  
dates/formulae,  
equations/quotes on  
one side & answers  
on the other



Draw  
pictures/diagrams/  
cartoon strips



Stage 2

Cover up your  
knowledge organiser  
and write everything  
you remember



Cover up the  
definitions. How  
many can you  
remember? Repeat.



Include pictures or  
diagrams if it helps.  
Read through them.



Label your  
pictures/diagrams/  
cartoon strips



Stage 3

Check. Correct  
mistakes in green  
and add anything  
you missed. Repeat



Check. Correct  
mistakes in green  
pen. Which ones do  
you find hard to  
remember?



Test yourself and get  
someone to test you.



Explain out loud to  
yourself or  
family/friend what  
your images show



Self quizzing

Mindmaps

Paired  
retrieval

Speak, Cover,  
Write, Check

Stage 1

Use your knowledge  
organiser to create  
quiz questions.



Create a mindmap of  
everything you can  
remember from your  
knowledge organiser



Give a family  
member/friend the  
knowledge organiser  
to hold



Read out loud the  
information from the  
knowledge organiser  
several times.



Stage 2

Write down the  
answers to your quiz



Check your  
knowledge organiser  
& use a green pen to  
make any  
corrections.



Get them to test you  
using the knowledge  
organiser



Cover up your  
knowledge organiser  
and write everything  
you remember



Stage 3

Keep self-quizzing  
until you get all the  
answers correct



Add additional  
information to your  
mindmap or make  
connections to other  
knowledge



Write down your  
answers to their  
questions



Check. Correct  
mistakes in green  
and add anything  
you missed.



Choose any of the following activities to complete your homework



LEARNINGSIENTISTS.ORG

LEARN TO STUDY USING ...

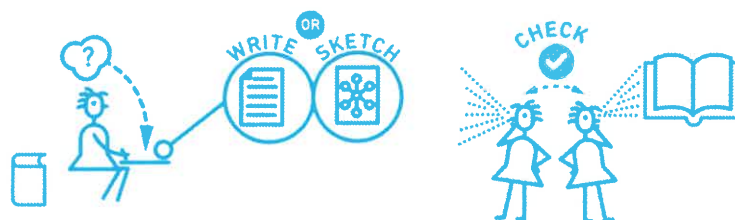
# Retrieval Practice

PRACTICE BRINGING INFORMATION TO MIND



## HOW TO DO IT

Put away your class materials, and write or sketch everything you know. Be as thorough as possible. Then, check your class materials for accuracy and important points you missed.



Take as many practice tests as you can get your hands on. If you don't have ready-made tests, try making your own and trading with a friend who has done the same.



You can also make flashcards. Just make sure you practice recalling the information on them, and go beyond definitions by thinking of links between ideas.



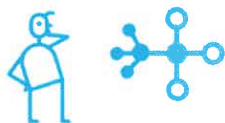
## HOLD ON!



Retrieval practice works best when you go back to check your class materials for accuracy afterward.



Retrieval is hard! If you're struggling, identify the things you've missed from your class materials, and work your way up to recalling it on your own with the class materials closed.



Don't only recall words and definitions. Make sure to recall main ideas, how things are related or different from one another, and new examples.

## RESEARCH

[Read more about](#) Roediger, H. L., Putnam, A. L., & Smith, M. A. (2011). Ten benefits of testing and their [retrieval practice](#)

applications to educational practice. In J. Mestre & B. Ross (Eds.), *Psychology of learning and motivation: Cognition in education*, (pp. 1-36). Oxford: Elsevier. [as a study strateg](#)



# GCSE FINE ART

## THE SURREAL AND SUBLIME

### Assessment objective 1

Develop ideas through investigations informed by contextual and other sources, demonstrating analytical and cultural understanding.

- Mind-map to identify subthemes
- Research 3 artists' work who interest you and inspire your ideas
- Write research in your own words
- Copy examples of the artists' work

### Artist Research

#### 1. ARTIST NAME

On the page you should write down the artist's name. This could either be hand written in a suitable lettering or printed from the computer.

#### 2. IMAGES

Print and stick down images of your artist's work. Make sure they are high quality and not pixelated.

#### 3. ANALYSIS

For each artist you must analyse at least one piece of their work in depth. Use the Analysing Artists prompt sheet to guide you with what to write. This can either be NEATLY hand written or typed and printed.

#### 4. STUDIES

Complete a study for each artist you research. This could be a copy/study of a section of the artists work OR your own interpretation in the style of the artists work. If you have time it would be beneficial to do both!



**General information about the artist: who are they? When did they work? What media do they work in? Are they well known for their work, if so why? Are they part of a genre of art or art movement? Is there anything significant about their life that might have inspired their work?**

### GRADE 9 COURSEWORK SKETCHBOOK

### Assessment objective 3

Record ideas, observations and insights relevant to your intentions in visual and/or other forms.

- Take at least 30 photographs of your idea/subject
- Produce at least 8 studies from these photographs in different media
- *Idea:* Photocopy one of your drawings and use oil pastels over the top
- Link these studies to artists' styles and/or techniques
- Add notes/annotations to all of your studies



### Assessment objective 2

Refine ideas through experimenting and selecting appropriate resources, media, materials, techniques and processes.

- Create 5 studies from secondary sources
- Create 5 studies from primary sources
- Use at least 3 different media

1 **Describe** your artwork.  
Some questions to consider: What does your artwork look like? What is the subject matter? What is the title of your work? What elements or principles are most obvious in your work?

2 **How did you create your art?**  
Some questions to consider: What media is your artwork made from? What tools, techniques or processes did you use to create your artwork?

3 **What is the big idea behind your artwork?**  
Some questions to consider: What or who inspired your artwork? Does your work express a personal or social issue? What emotions did you try to show in your artwork?

4 **What were your goals for this artwork?**  
Some questions to consider: What are your goals as an artist? Did this piece help you reach your goals? Why or why not?

5 **What are your overall thoughts of your artwork?**  
Some questions to consider: What did you learn in creating this artwork? Is the final piece what you imagined? How so? How will this piece influence your future artworks?

### Assessment objective 4

Present a personal, informed and meaningful response demonstrating analytical and critical understanding, realising intentions and, where appropriate, making connections between visual, written, oral or other elements.

- Show evidence for 2 different ideas of possible outcomes. Explain both ideas.
- Your final idea must link to an artists' work in some way.
- Create a final outcome using media you are confident with and it must show at least 10 hours worth of work.

## Surreal

- Digital distortion (*Francis Bacon*)
- Metamorphosis (*Andrea Matus*)
- Divide and colour (*Robert Delaunay*)
- Relief sculpture & lino print (*Louise Nevelson*)

## Sublime

- Natural forms
- Rural and urban landscapes (*Ian Murphy & Kurt Jackson*)

### Project overview



# AO1

## Assessment Objective 1



AO1 is about developing ideas from a starting point to a final piece. This is done through A-mapping, sketches and studies related to the work of other artists, designers and craftspeople. You need to analyse and understand these contextual sources, and develop your ideas in a personal way.

You can begin to develop your ideas once you have collected your source materials. You might have some general concepts about what you want to do, but your ideas will change and develop as you investigate your source material. You'll need to do more research and find new source materials as your work develops.



Artist Research

Primary Drawings  
Observations

Annotations

# AO3

Assessment Objective 3 is about recording your ideas, observations and insights, which can be in visual, written and other forms. You should work from a range of experiences and stimulus materials, as each of these could lead you to different ways of developing your ideas. You should reflect upon your work, and consider what you have achieved at each stage and what you will do next.



You need to demonstrate that you understand how artists and designers work, and relate this to the ideas that you record. This may be done using images, different media, sketches, diagrams and studies. You should demonstrate connections between your own recordings and the work of other artists and designers by carefully organising these observations in your sketchbook.

# AO2

## Assessment Objective 2

Assessment Objective 2 is about refining your ideas through selecting and experimenting with appropriate resources, media, materials, techniques and processes. There are various ways of using these to develop ideas and create a personal response.

Experimenting with media



Using artists' inspiration

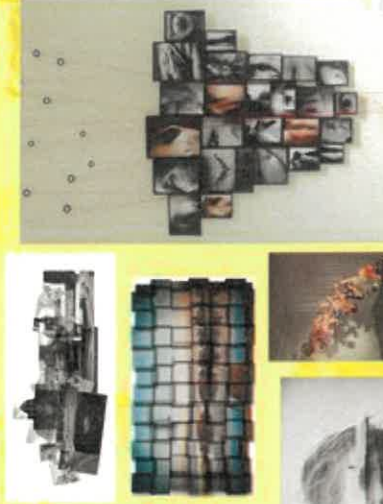
Cut, layer and experiment with photographs and papers.

Experiments, practical samples and studies in different media demonstrate that you have developed and communicated your ideas through practical investigation. This will equip you with a working vocabulary of resources, practical knowledge and technical skills and enable you to make an informed choice when selecting materials and approaches for your theme.



# AO4

Assessment Objective 4 is about presenting a personal, informed and meaningful response, from your initial research through to the final piece. You need to demonstrate analytical and critical understanding as you respond to your theme. By practising your skills in using different media and processes you are able to develop the ways in which you convey your ideas and responses - your personal visual language.



You must show that you have understood the theme, and that you have an understanding of the way artists, designers or craftspeople work. You need to demonstrate this understanding in your research and development studies, as well as in your final piece.



## Learning Outcome 4: Understand Customer service and internal influences on Business

### Customer service

**Customer service** is all about the level of help and support that is offered by an organisation to its customers...before, during and after the customer purchases a product or decides to use a service.

**High-quality** customer service includes

- many aspects, such as:
- Great knowledge of products/services
- The ability to keep calm in stressful situations
- Excellent listening and communication skills
- Focusing on customer needs and requirements at all times
- Gathering feedback from customers and using this to implement changes and improvements

Different ways of providing customer service, are face to face, online and over the telephone, and may involve answering customers' questions, offering advice and recommendations etc

How customer service is measured in business

1. Customer satisfaction scores
2. Repeat business data
3. Levels of complaints/compliments
4. Customer surveys
5. Mystery shoppers

How can good customer service be delivered?

- ☑ Ensuring the product is safe and reliable
  - ☑ Engaging with customers to find out what they want – assessing their needs.
- Sales person needs to be polite, friendly, genuine, make the customer feel important e.g. offering next-day delivery.
- ☑ Providing excellent product knowledge (written info as well as staff knowledge). Confidence in the sales person may encourage customers to make a purchase.
  - ☑ Providing an after-sales service e.g. user training, helpline or following up with offering
  - ☑ Operating from well-maintained premises with provision for all e.g. disabled customers.
  - ☑ Delivering goods on time.
  - ☑ Allowing different methods of payment.



What are the benefits of good customer service?

- ☑ High levels of customer satisfaction
- ☑ Therefore loyal customers make repeat purchases
- ☑ Positive word of mouth
- ☑ Customers may spend more with a company they trust.

Why does poor customer service occur?

- ☑ Dissatisfied customers
- ☑ Negative word of mouth which spreads quickly, perhaps by social media.
- ☑ Poor reputation and falling revenue.



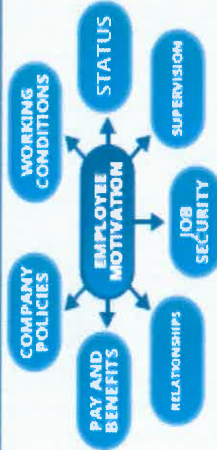
## Motivation

### Motivation

**Definition:** The range of factors that influence people to behave in certain ways.

### Absenteeism

**Definition:** Occurs when an employee is not present at his or her place of work.



### Benefits to Businesses of Having a Well Motivated Workforce

- Increase productivity / workers produce more per hour worked / improve performance of workers → could lead to greater profits
- Less staff turnover / less workers leaving the business → workers will be happy in their work and will stay loyal → reduce recruitment / training costs
- Lower absenteeism → workers are happy → improves productivity
- Loyal / committed workers → experienced and likely to be more efficient
- Improved employer / employee relations → industrial action less likely
- Improved quality of products
- Good customer service
- Improved business reputation → easier to recruit the best workers

## Financial Rewards

**Definition:** The use of money as a method of motivation.

**Examples:**

- Salaries / Wages
- Time Rate
- Piece Rate
- Overtime
- Profit Sharing
- Fringe Benefits



### Salaries

**Definition:** Generally paid to administrative and management workers. The salary is based on their work for the year.

### Wages

**Definition:** Generally paid to shop and factory floor workers based on time rates and / or piece rates.



### Time Rates

**Definition:** Paid to workers based on the number of hours worked.

### Piece Rates

**Definition:** Paid to workers based on the number of goods which are produced.

## Financial/rewards motivation

### Overtime

**Definition:** A higher hourly rate that is paid to employees for any additional hours worked.

### Performance Related Pay

**Definition:** An additional payment to an employee for achieving an agreed target.

### Bonus

**Definition:** An additional payment to an employee for achieving an agreed target.



### Commission

**Definition:** A payment to an employee based on achieving a certain level of sales.

### Profit Sharing

**Definition:** An additional reward paid to workers to reflect the profits earned by the business.

### Fringe Benefits

**Definition:** Rewards to workers not shown in their traditional pay. Such benefits may include company cars, or discount on company products.



## Motivational theories

1. **Maslow's Hierarchy of Need:** Abraham Maslow states that the needs at the bottom of the hierarchy must be satisfied before an individual can focus on needs at higher levels. The five levels in the hierarchy of needs are:



### Internal challenges of growth

One final challenge that a business may face internally is growth. Even though growth is a positive thing, and something most businesses strive for, it can cause problems if it is not anticipated or managed effectively.

- Maintaining customer service levels
- Diseconomies of scale
  - Control
  - Co-ordination
  - Communication

**Diseconomies of scale can have the following negative effects on a business:**

- The higher cost of production will reduce the profit levels of the business
- Reduced profit levels may force the business to increase its prices, to cover the higher production costs
- Increased prices may make the business less competitive, and customers may move away to cheaper competitors

### 2. Herzberg's two-factor theory

Professor Frederick Herzberg established a two-factor theory of motivation. The two factors contributing to overall motivation are:

- a) **Motivators** – these are factors that a business can use to directly motivate staff to work harder and more effectively. Job rotation, job enrichment and autonomy are all examples of motivators.
- b) **Hygiene factors** – these are factors that won't actually motivate a member of staff, but if these factors aren't present, then this can contribute to feelings of demotivation amongst staff. Examples of these factors are safe working conditions, reasonable pay, relationships with colleagues

### 3. Mayo's motivation theory

Elton Mayo believed that employees could be motivated more as a result of having their social needs met, rather than just using financial/monetary methods of motivation.

Mayo concluded that the following factors were key to motivating employees:

1. Better communication between managers and staff
2. Where possible, staff should work in teams or groups
3. Managers should have greater involvement in the working life of their staff

### Keywords:

**Economies of scale** is where unit costs fall as output increase. However, if a business grows too large or too quickly, then **diseconomies of scale** can occur when the unit cost of production in a business **increases**, as the business grows.

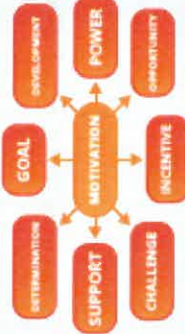


## Non-Financial Rewards

**Definition:** The use of non-monetary means to try and raise employee performance.

**Examples:**

- Job Enlargement
- Job Rotation
- Job Enrichment
- Empowerment
- Training



## Job Enlargement

**Definition:** Redesigning a worker's job so that it contains more tasks of a similar level of complexity.

This means that the employee's work can become more varied and can help to reduce the monotony associated with an employee's job.

## Job Enrichment

**Definition:** Designing a job to give interesting and challenging tasks.

Some employees may lack motivation because they are bored. Job enrichment can help to correct this by making the jobs more demanding and challenging. It can give employees more diverse duties as well as more authority to take decisions at work.

## Empowerment

**Definition:** Gives employees greater control over their working lives.

This might mean that employees can organise their own work and make some decisions without involving their managers.

## Job Rotation

**Definition:** The regular switching of staff between jobs of a similar degree of complexity. This stops the employee getting bored!

## Training

**Definition:** A range of activities giving employees job-related skills and knowledge.

## Ways to Raise Worker Performance



- **Higher Pay**
  - ❑ to encourage workers to work harder → may be short-term benefit
  - ❑ but this will increase the business cost
- **Bonus / Commission**
  - ❑ will relate pay to amount / quality of work
  - ❑ but may be expected by workers, targets to be set → demotivation if not achieved
- **Longer Holidays**
  - ❑ to provide rest / enthusiasm for work
  - ❑ will cost → will mean work not being done → dissatisfied customers
- **Promotion / job title**
  - ❑ gives feeling of importance → reward for work
  - ❑ but only limited availability → envy in the workplace → internal promotions may not be good for dynamic business
- **Health care / insurance**
  - ❑ encourages workers to stay
  - ❑ but cost
- **Working environment**
  - ❑ increased efficiency
  - ❑ cost of production
- **Training / better qualifications**
  - ❑ worker feels better about self → encouraged to work harder
  - ❑ but cost of training → better qualified workers may find jobs elsewhere → increased worker turnover
- **Pension Schemes**
  - ❑ ensure long-term security of worker → more likely to remain
  - ❑ but employee contributions add to costs → able to transfer pension to other employment
- **Ethical Policies**
  - ❑ will involve the way the worker is treated → e.g. good communication / conditions → may not be costly
  - ❑ but employer may be seen as not sufficiently autocratic
- **Rewards for best workers**
  - ❑ e.g. employee of the week → motivate employee to work harder to get the award
  - ❑ but may demotivate others





## Learning Outcome 5: Understand External influences on Business

External influences/factors that can affect a business

1. GDP
2. Interest rates
3. Changes in living wage
4. Changes in fashions and trends
5. Changes in the competitive environment
6. Level of employment
7. Availability of skills locally
8. Changes to legislation
9. Changes in tax rates
  - VAT
  - Income tax
  - Corporation tax

**Gross Domestic Product (GDP)** is total value of goods and services provided in a country during one year. Interest rates are set by the Bank of England and affect the interest paid on savings and borrowing, for example, mortgages and loans. If interest rates are 2% this means on every £100 the bank would pay you 2% or £2 per year on your savings.

**Changes in living wage.** The national living wage is set by the Government for all worker 25 and older. This is the minimum that any employer can pay workers of this age. If you are 24 or under you will receive the national minimum wage, which is also set by the government. It is an offence to be paid less than this. The rates are reviewed and changed regularly. Find out the latest information at

[www.gov.uk/national-minimum-wage-rates](http://www.gov.uk/national-minimum-wage-rates)

**Changes in tax rates.** The Government controls the amount of tax business and individuals pay to contribute to the state. **VAT** means Value Added Tax and is added to the sale of goods and services of UK businesses. Some items are exempt from VAT for examples postage stamps and children's clothes. Businesses must be registered for VAT and charge VAT to all customers if they have an income of more than £80000

**Changes in the competitive environment.** If more companies offer the same goods at different prices, or a wider range of the product, this can influence the market. If a large competitor using its economics of scale to undercut existing suppliers then this can impact on the profits of others. If raw material prices increase or transport or rent costs increase or decrease this can affect the competitive environment.

### Challenges of growth

You will know and understand the challenges of growth and how they apply in business, including:

- Additional physical resource requirements
- Additional human resource requirements
- Local cultural sensitivities
- Understanding of local legislation

You'll find lots of useful information on



# INTEREST RATES

## AND

Interest rates affect business in 3 ways:

- It the **cost to the business** of borrowing
- It is the **cost to the consumer** of borrowing
- It is the **reward for saving**

**Current interest rates for the UK are 0.25% - VERY LOW!**

*An interest rate is added to loans and mortgages, if it increases then businesses and consumers have less cash / disposable income available to spend on expanding the business OR (as a consumer) to spend on luxury goods and services. This affects business' revenue and profit.*

*Also when interest rates increase, saving becomes more attractive therefore consumers may decide to invest instead of spending. This may also affect businesses negatively.*



Inflation is the general rise in prices.  
The Bank of England is responsible for controlling inflation and keep it at its 2% target.

### THE LINK WITH INTEREST RATES:

#### **If inflation is too high:**

The Bank of England will raise the interest rate. This should reduce the demand for goods and services which will slow down inflation

#### **If inflation is too low:**

The Bank of England will reduce the interest rate. This should lead to a rise in demand

### **The Government makes us pay taxes for several reasons:**

- To pay for the goods and services it provides
- To raise the price of some goods that cause external costs like cigarettes, alcohol and petrol

The Government spends money for several reasons:

- To provide goods and services
- To help poorer or unfortunate people
- To help businesses

### TYPES OF TAX:

- **Taxes paid on income:**
  - Income tax
  - National insurance contributions
  - Corporation tax

#### **Taxes paid on spending:**

- VAT
- Excise duties
- Business rates



# Knowledge Organiser 9 : Algorithms

## 1. Computational Thinking

|                                     |                                                                                                                                                                                                                                                                                                    |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Abstraction                         | The process of removing unnecessary details and including only the relevant details. It is a method of computational thinking that focusses on what is important in problem solving                                                                                                                |
| Decomposition                       | The process of breaking a complex problem down into smaller more manageable parts. Dealing with many different stages of a problem at once is much more difficult than breaking a problem down into a number of smaller problems and solving each, one at a time.                                  |
| Advantages of Program Decomposition | <ul style="list-style-type: none"><li>• Makes problems easier to solve. Different people can work on different parts of a problem at the same time...</li><li>• ...reducing development time.</li><li>• Program components developed in one program can easily be used in other programs</li></ul> |
| Algorithmic Thinking                | A way of getting to a solution by identifying the individual steps needed. By creating a set of rules, an algorithm that is followed precisely, leads to an answer. Algorithmic thinking allows solutions to be automated.                                                                         |

## 2. Input Processes and Output

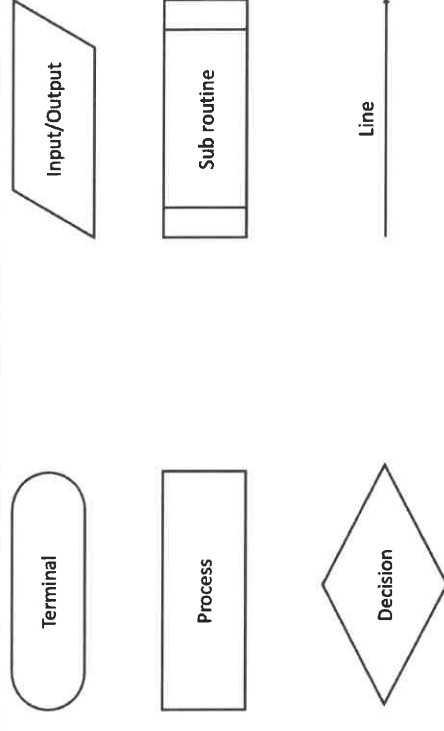
|           |                                                                                                                                                                                                                                                |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Inputs    | <ul style="list-style-type: none"><li>• Anything which needs to be supplied to the program so it can meet its goals.</li><li>• Often input by the user.</li><li>• Consider an appropriate variable name and data type for the input.</li></ul> |
| Processes | <ul style="list-style-type: none"><li>• Consider what calculations need to be performed while the program is running.</li><li>• Does data need to change formats or data types</li></ul>                                                       |
| Outputs   | <ul style="list-style-type: none"><li>• Consider what your program need to output.</li><li>• Consider what form this output need to take.</li><li>• Consider an appropriate variable name and data type for any output</li></ul>               |

## 3. Structure Diagrams

- Structure diagrams illustrate problem decomposition.
- They can be used for developers to understand a problem to code and to share with users during systems analysis.
- They are produced using a method known as step-wise refinement.
- Break problem down using decomposition into ever smaller components.
- Some areas of the program will need breaking down more than others.
- The lowest level nodes should achieve a single task.
- These can then be coded as a single module or sub-program.

## 3. Flowcharts, Pseudocode and OCR Reference Language

|                        |                                                                                                                                                          |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Flowchart              | A method of representing the sequences of steps in an algorithm in the form of a diagram. Sometimes called a Flow diagram                                |
| Structure Diagram      | A diagram showing a top-down breakdown of a complex problem                                                                                              |
| Pseudocode             | A text based alternative of representing the sequences of steps in an algorithm. Pseudo-code can be thought of as a simplified form of programming code. |
| OCR Reference Language | You must be able to read this but you can always use Python in your exams—but be precise                                                                 |



## 4. Types of Errors

|              |                                                                                                                                |
|--------------|--------------------------------------------------------------------------------------------------------------------------------|
| Syntax Error | Syntax errors are errors which break the grammatical rules of the programming language. They stop it from being run/translated |
| Logic Errors | Logic errors are errors which produce unexpected output. On their own they won't stop the program running                      |

## 5. Trace Tables

- A vital skill for understanding program flow and testing the accuracy of an algorithm for logic is called "Tracing Execution".
- Examine a printed extract of program code and running thorough the program.
- Take each line at a time and write out in a trace table the current state of each variable. Noting down any output the program produces.
- Each variable present in the program should have its own column in the trace table.
- A new row should be added under any column if the state of a variable changes.
- Trace tables are an excellent way to track down logic errors in a problem.

# Knowledge Organiser 10 : Searching and Sorting Algorithms

## 1. Binary Search

|                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The Algorithm             | <ul style="list-style-type: none"> <li>Calculate a mid-point in the data set.</li> <li>Check if that is the item to be found.</li> <li>If not... <ul style="list-style-type: none"> <li>If the item to be found is lower than the mid-point, repeat on the left half of the data set.</li> <li>If the item to be found is greater than the mid-point, repeat on the right half of the data set.</li> </ul> </li> <li>Repeat until the item is found or there are no items left to check.</li> </ul> |
| Requirements / Efficiency | <ul style="list-style-type: none"> <li>Requires the data set to be in order of a key field.</li> <li>Can be done with letters as well as numbers—use alphabetical order</li> <li>More efficient than a linear search on average</li> </ul>                                                                                                                                                                                                                                                          |

## 2. Linear Search

|                           |                                                                                                                                                                                                                                                    |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The Algorithm             | <ul style="list-style-type: none"> <li>Starting from the beginning of a data set, each item is checked in turn to see if it is the one being searched for</li> </ul>                                                                               |
| Requirements / Efficiency | <ul style="list-style-type: none"> <li>Doesn't require the data set to be in order.</li> <li>Will work on any type of storage device.</li> <li>Can be efficient for smaller data sets.</li> <li>Is very inefficient for large data sets</li> </ul> |

## 3. Bubble Sort

|               |                                                                                                                                                                                                                                                                                                                                                                  |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The Algorithm | <ul style="list-style-type: none"> <li>Sorts an unordered list of items.</li> <li>It compares each item with the next one and swaps them if they are out of order.</li> <li>The algorithm finishes when no more swaps need to be made.</li> <li>In effect it "bubbles" up the largest (or smallest) item to the end of the list in successive passes.</li> </ul> |
| Efficiency    | <ul style="list-style-type: none"> <li>This is the most inefficient of the sorting algorithms but is very easy to implement.</li> <li>This makes it a popular choice for very small data sets</li> </ul>                                                                                                                                                         |

## 6. For the exam

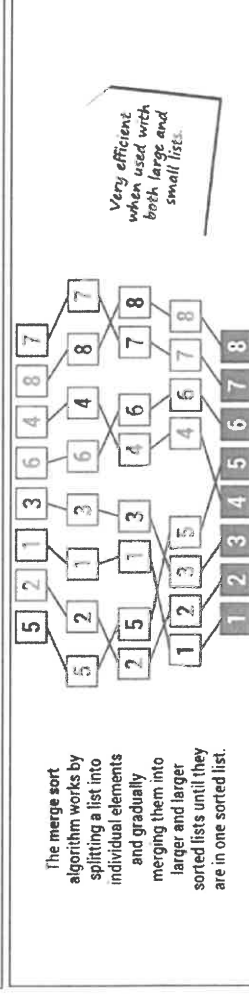
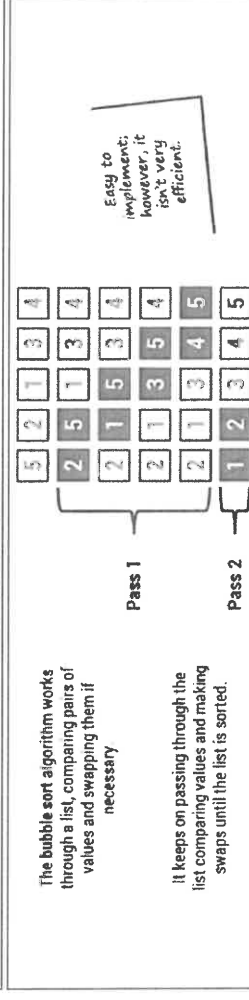
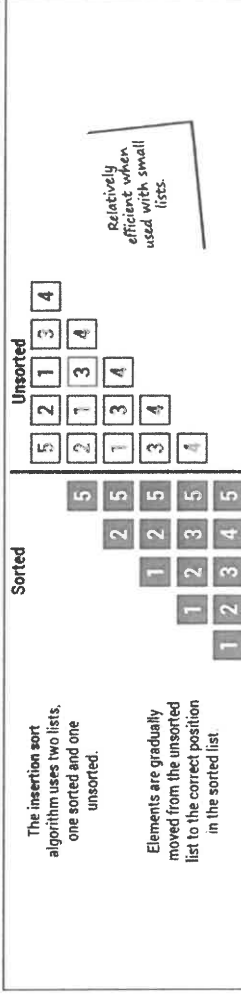
|   |                                                |
|---|------------------------------------------------|
| ✓ | Understand the main steps of each algorithm    |
| ✓ | Understand any pre-requisites of an algorithm  |
| ✓ | Apply the algorithm to a data set              |
| ✓ | Identify an algorithm if given the code for it |
| ✓ | Show all your steps in detail                  |
| x | To remember the code for these algorithms      |

## 4. Insertion Sort

|               |                                                                                                                                                                                                                                                                               |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The Algorithm | <ul style="list-style-type: none"> <li>The insertion sort inserts each item into its correct position in a data set one at a time.</li> </ul>                                                                                                                                 |
| Efficiency    | <ul style="list-style-type: none"> <li>It is a useful algorithm for small data sets.</li> <li>It is particularly useful for inserting items into an already sorted list.</li> <li>It is usually replaced by more efficient sorting algorithms for large data sets.</li> </ul> |

## 5. Merge Sort

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The Algorithm | <ul style="list-style-type: none"> <li>A very efficient method of performing a sort.</li> <li>Uses a divide and conquer method.</li> <li>Creates two or more identical sub-problems from the largest problem, solving them individually.</li> <li>Combines their solutions to solve the bigger program.</li> <li>Data set is repeatedly split in half until each item is in its own list.</li> <li>Adjacent lists are then merged back together.</li> </ul> |
| Efficiency    | <ul style="list-style-type: none"> <li>Works very well for large data sets.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                      |





# KNOWLEDGE ORGANISER – DRAMA – YEAR 10 - TERM 4 – COMP 1

## SUMMARY OF ASSESSMENT

Component 1: Devising Theatre  
Non-exam assessment: internally assessed, externally moderated  
40% of qualification

Learners will be assessed on **either** acting **or** design.

Learners participate in the creation, development and performance of a piece of devised theatre using **either** the techniques of an influential theatre practitioner **or** a genre, in response to a stimulus set by WJEC. Learners must produce:

- a realisation of their piece of devised theatre
- a portfolio of supporting evidence
- an evaluation of the final performance or design.

| Round                                                                                                                    | By                                                                                                                                       | Through                                                                             | Push Hands                                                                                                                                                                                                                 | Fluff                                                                                                                                                                                      | Chair Duets                                                                                                                                                                                                                  |
|--------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                       |                                                       |  |                                                                                                                                         |                                                                                                         |                                                                                                                                           |
| The term <b>ROUND</b> is chosen to represent any move that involves passing closely <b>ROUND</b> the body of the partner | BY comes after the first two moves. The space between A & B is 'squeezed out'.<br><br>A or B 'slots in' to stand closer BY their partner | THROUGH is the idea of passing through the upper body / arms of the partner         | The person with their hand on top is in control, gently leading their partner around the space, trying to keep their hands flat and the pressure constant. You should take your partner on a journey exploring all levels. | Partners sit opposite knee to knee. A choose three ways to adjust B's appearance. B choose three ways to adjust A's appearance. Continue to add more moves, and avoid a predictable rhythm | Partners sit in chairs, both facing forward. Partners take turns placing their hand on to their partner or moving their partner's hand, swapping and adding to the sequence. Repeat until the moves are clear and memorised. |

**FRANTIC ASSEMBLY**

## Stimuli

'What's the point of having a voice if you're gonna be silent in those moments you shouldn't be?' – The Hate U Give by Angie Thomas



We are all in the same boat - Banksy

Song- Superheroes – The Script  
<https://www.youtube.com/watch?v=W1m1GgRz6M&themeRefresh=1>

'Life itself is the most wonderful fairy tale' – Hans Christian Andersen

**Episodic Structure/Montage:** The play is split into separate episodes, that can 'stand alone'. The episodes jump around in time, place and featured characters, so that the audience doesn't become 'engrossed' in a specific moment.



**Gestus:** A gesture which represents a character's attitude, status or social position (eg a servant's bow). These gestures are repeated by characters to make them more stereotypical.



**Narration:** Actors narrate what their character is doing either just before they do it or as they are doing it.



**Picardis:** held up by the character(s) to deflect the audience's attention away from the emotion; they usually show thought provoking facts, statistics or information.



**Music/song:** Characters often sing in the middle of the scene, or add music and movement sequences instead of using words and dialogue. Sometimes nursery rhymes with changes to the lyrics are used.



BERTOLT BRECHT

**Bertolt Brecht**





# Modelling and Design

## Shaping and finishing

**Metal file**

|                                                                                    |                                                                                    |                                                                                    |                                                                                    |
|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| smooth wood, metal or plastic                                                      | An abrasive paper used to smooth the surface or edges of plastic                   | A rough metal file                                                                 | To enable paper and card to bend/fold                                              |
|  |  |  |  |
| Abrasive paper                                                                     | Rasp                                                                               | Scoring                                                                            |                                                                                    |

Quinn

|                   |                                                                                    |                                          |  |
|-------------------|------------------------------------------------------------------------------------|------------------------------------------|--|
| Manufacturing     |                                                                                    |                                          |  |
| Pins              |  | Metal pins to secure two pieces together |  |
| Double sided tape |  | Tape can bond foam or card/paper         |  |
| Masking tape      |  | Temporary tape to bond card/paper        |  |
| Tabs              |  | To ensure clean bonds                    |  |

## Keywords

|                            | Ideation                     | Evaluation                   | Manufacture                  |
|----------------------------|------------------------------|------------------------------|------------------------------|
| 1. Problem identification  | 1.1. Problem identification  | 1.2. Problem identification  | 1.3. Problem identification  |
| 2. Problem analysis        | 2.1. Problem analysis        | 2.2. Problem analysis        | 2.3. Problem analysis        |
| 3. Solution generation     | 3.1. Solution generation     | 3.2. Solution generation     | 3.3. Solution generation     |
| 4. Solution evaluation     | 4.1. Solution evaluation     | 4.2. Solution evaluation     | 4.3. Solution evaluation     |
| 5. Solution implementation | 5.1. Solution implementation | 5.2. Solution implementation | 5.3. Solution implementation |



## Double



100

|                            | Ideation                   | Evaluation                 | Manufacture                |
|----------------------------|----------------------------|----------------------------|----------------------------|
| 1. Problem identification  | 1. Problem identification  | 1. Problem identification  | 1. Problem identification  |
| 2. Problem analysis        | 2. Problem analysis        | 2. Problem analysis        | 2. Problem analysis        |
| 3. Solution generation     | 3. Solution generation     | 3. Solution generation     | 3. Solution generation     |
| 4. Solution selection      | 4. Solution selection      | 4. Solution selection      | 4. Solution selection      |
| 5. Solution implementation | 5. Solution implementation | 5. Solution implementation | 5. Solution implementation |
| 6. Solution evaluation     | 6. Solution evaluation     | 6. Solution evaluation     | 6. Solution evaluation     |
| 7. Solution refinement     | 7. Solution refinement     | 7. Solution refinement     | 7. Solution refinement     |
| 8. Solution dissemination  | 8. Solution dissemination  | 8. Solution dissemination  | 8. Solution dissemination  |
| 9. Solution adoption       | 9. Solution adoption       | 9. Solution adoption       | 9. Solution adoption       |
| 10. Solution evaluation    | 10. Solution evaluation    | 10. Solution evaluation    | 10. Solution evaluation    |

## Health and Safety in DT:

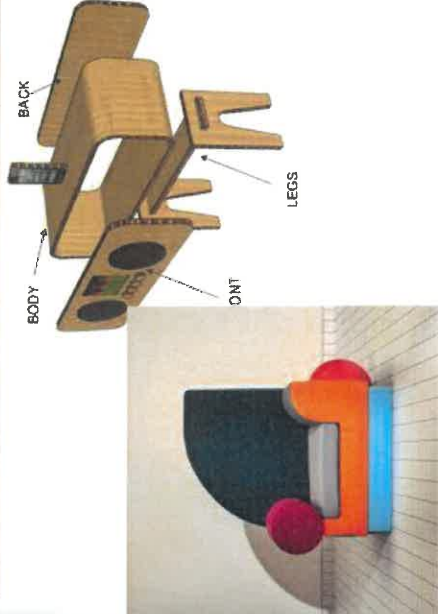
- Listen to your teacher's instructions
- Always wear an apron
- Long hair should be tied back
- Don't use equipment you haven't been taught to use
- Always stand up during demonstrations
- When using machines, always use the correct technique
- Only use the stop button if you are told to
- Work quietly and be sensible

on  
DT:

act  
ent



Emergency stop





# YEAR 10 D&T RESISTANT MATERIALS POLYMERS AND DRAWING TECHNIQUES

| Tools and Equipment   |                                                         |
|-----------------------|---------------------------------------------------------|
| Measuring and marking |                                                         |
| Steel rule            | An accurate tool for measuring and marking out          |
| Try square            | A tool used to check right angles on wood or plastic    |
| Template              | A template is a tool used to mark out shapes repeatedly |

| Shaping and finishing |                                                                  |
|-----------------------|------------------------------------------------------------------|
| Metal file            | Used to shape or smooth wood, metal or plastic                   |
| Wet and Dry Paper     | An abrasive paper used to smooth the surface or edges of plastic |
| Disc sander           | A machine used to smooth the edges of materials                  |

### What is good design?

- Clear ideas
- Annotations
- Measurements
- Content
- Presentation
- Balance

### Maths in DT:

- Multiplication
- Divide
- Add / Subtract
- Measurement conversion
- Ratios
- Percentages
- Surface area

## Polymers

Thermoplastic Polymer  
*A polymer which can be reheated and moulded.*

Acrylic  
High impact polystyrene (HIPS)  
Polypropylene (PP)

Thermosetting Polymer  
*A polymer which cannot be re-moulded.*

Epoxy resin (ER)  
Melamine Formaldehyde (MF)  
Urea Formaldehyde (UF)

## Polymer processes

Injection moulded  
Extrusion  
Vacuum formed

| Cutting      |                                                                                              |
|--------------|----------------------------------------------------------------------------------------------|
| Coping saw   | A hand saw used to cut complex shapes in wood and plastic                                    |
| Scroll saw   | A machine saw used to cut complex shapes in wood and plastic                                 |
| Vice         | Supports work whilst cutting or finishing                                                    |
| Pillar drill | A machine used to make holes in materials                                                    |
| Laser cutter | CAM: Laser cutting is the use of a high-powered laser to cut, etch and engrave your material |

## Orthographic Drawing

### ORTHOGRAPHIC PROJECTIONS

QUESTION #8

## Isometric

## 2-pt Perspective

### Keywords

|               |               |
|---------------|---------------|
| Template      | Modelling     |
| Polymer       | Acrylic       |
| Tensol Cement | Specification |
|               | Research      |
|               | Evaluation    |

6Rs  
Sustainable  
Manufacture

### Health and Safety in DT:

- Listen to your teacher's instructions
- Always wear an apron
- Long hair should be tied back
- Don't use equipment you are not trained on
- Always stand up during practical lessons
- When using machines, always wear safety glasses
- Only use the stop button in an emergency
- Work quietly and be sensible and careful at all times



#### AIMS at a glance- to learn about

- Composition of food
- Preparation, cooking and safe use of food
- The science of ingredients
- Food sources and origins
- Cultures
- Food choices and healthy well being
- Food choices and the global environment
- Being an informed food consumer

#### NEA and WRITTEN ASSESSMENT

Food investigation Task – 20%

Food preparation task – 30%

Written assessment – 50%

#### PRACTICAL SKILLS

- Skill 1 - General practical skills
- Skill 2 – Knife skills
- Skill 3 – Preparing fruit and veg
- Skill 4 – Use of the cooker
- Skill 5 – Use of equipment
- Skill 6 – Cooking methods
- Skill 7 – Prepare, combine and shape
- Skill 8 – Sauce making
- Skill 9 – Tenderise and marinate
- Skill 10 – Dough
- Skill 11 – Raising agents
- Skill 12 – Setting mixtures

### GCSE FOOD PREPARATION AND NUTRITION- KNOWLEDGE ORGANISER

#### KEY WORDS

- ANALYSE
- HYPOTHESIS
- CONTROL
- MENU
- LIFESTAGE
- CULINARY TRADITIONS
- TIME PLAN
- DOVETAIL
- MISE en PLACE

#### TOP TIPS FOR COMPLETING NEA WORK

- Plan your work carefully
- Include aims and conclusions
- Explain and justify decisions
- Research must be concise
- Show case your practical skills
- Use subject specific terminology
- Nutritional knowledge must be evident

#### COURSE CONTENT

- Food nutrition and health
- Nutritional needs and health
- Food science
- Food safety
- Functional and Chemical properties of food
- Principles of food safety
- Food choices
- Cuisines
- Sensory evaluation
- Food provenance



|            |                                                                                                                                                                                                                            |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A01</b> | Develop ideas through investigations informed by contextual and other sources, demonstrating analytical and cultural understanding.                                                                                        |
| <b>A02</b> | Refine ideas through experimenting and selecting appropriate resources, media, materials, techniques and processes.                                                                                                        |
| <b>A03</b> | Record ideas, observations and insights relevant to their intentions in visual and/or other forms.                                                                                                                         |
| <b>A04</b> | Present a personal, informed and meaningful response demonstrating analytical and critical understanding, realising intentions and, where appropriate, making connections between visual, written, oral or other elements. |

## Task One- A01/A02

Present a moodboard bursting with images of Wearable Art

You can use materials like: magazines, posters, leaflets, books and newspapers to find imagery as well as the internet. Fill the entire page with imagery.



## A01: INVESTIGATE



Research, analyse and develop ideas

## A02: EXPERIMENT



Explore a range of media, techniques and processes

## A03: RECORD



Draw, photograph, write

## A04: OUTCOME



Make a final piece of art

## Task Two A03

Create a range of designs linked to your culture of possible 'wearable Art' designs.

Link to inspirational Artists that have influenced your mood board from Task One

## Task Three A04

Produce your outcome

Make your 'wearable Art piece'.

Consider the range of construction and surface decoration techniques that you have explored in class.

## ANALYSING ARTIST'S WORK

| 1. INTRODUCTION                                                                                                                                                                                                          | 2. CONTEXT                                                                                                                                                                                                          | 3. CONTENT                                                                                                                                                                                                          | 4. THE FORMAL ELEMENTS                                                                                                                                                                                                 | 5. PROCESS                                                                                                                                                                                                          | 6. MOOD                                                                                                                                                                                                      | 7. CONNECTIONS                                                                                                                                                                                                      | 8. EMULATE (for Art)                                                                                                                                                                                                |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Describe the artist. Consider the following:<br>• Who created the work?<br>• What themes does the work explore?<br>• What is the artist's style?<br>• What is the artist's medium?<br>• What is the artist's background? | Explain why the artist created the work. Consider the following:<br>• What was the artist's intention?<br>• What was the artist's context?<br>• What was the artist's audience?<br>• What was the artist's message? | Explain why the artist created the work. Consider the following:<br>• What was the artist's intention?<br>• What was the artist's context?<br>• What was the artist's audience?<br>• What was the artist's message? | Describe what formal elements are in the artwork.<br>• Identify what formal elements are in the artwork.<br>• Identify what formal elements are in the artwork.<br>• Identify what formal elements are in the artwork. | Explain how the artist created the work. Consider the following:<br>• What was the artist's intention?<br>• What was the artist's context?<br>• What was the artist's audience?<br>• What was the artist's message? | Describe the mood of the artwork. Consider the following:<br>• What was the artist's intention?<br>• What was the artist's context?<br>• What was the artist's audience?<br>• What was the artist's message? | Explain how the artist created the work. Consider the following:<br>• What was the artist's intention?<br>• What was the artist's context?<br>• What was the artist's audience?<br>• What was the artist's message? | Explain how the artist created the work. Consider the following:<br>• What was the artist's intention?<br>• What was the artist's context?<br>• What was the artist's audience?<br>• What was the artist's message? |

## GCSE TEXTILES CULTURES

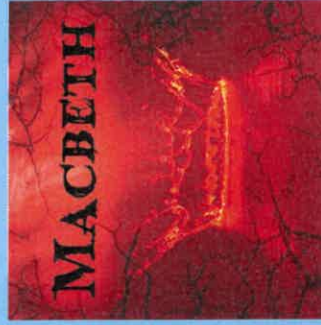




## Y10 – 'Macbeth' term 3/4

### Key Quotations

- "Fair is foul, and foul is fair." The witches.
- "Is this a dagger which I see before me?" Macbeth
- "Unsex me here." Lady Macbeth
- "Out damned spot! Out I say!" Lady Macbeth
- "His mother's womb untimely ripped." The witches/ Macduff.



### KEY WORDS

- Loyalty
- King
- Guilt
- Fear
- Prophecy
- Supernatural
- Hallucination
- Treason

## Contextual Information

|              |                                                                                                                                                                           |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Witchcraft   | People believed in witches and bad events were blamed on women who were considered to be witches. They were also tested in this time and KJ was superstitious about them. |
| King James I | Ordered huge witch hunts (bigger than ever seen before) in Scotland. He also survived an assassination attempt.                                                           |
| Monarchy     | His mother was known as an incompetent ruler and KJ was constantly worried, when he become King of England, that people would rebel and overthrow him.                    |

## Themes

|                           |                                                                                                                                                                                                    |
|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ambition                  | Macbeth allows his ambition to overwhelm him and becomes a murderer. LM is affected by the guilt of her actions caused by her ambition.                                                            |
| Guilt                     | Macbeth feels guilt early on whilst LM becomes guilty later on which leads to her increasing lack of sanity.                                                                                       |
| The Supernatural          | The witches are a clear image, as well as Macbeth disrupting the social and political order by killing KD. Also raging storms are presented mirroring Macbeth & LM's acts.                         |
| Power                     | Macbeth deeply desires power. Macbeth abuses his power when he is King to avoid any threats. Lady Macbeth also desires power which is not considered a traditional trait for a woman of this time. |
| Masculinity vs Femininity | Many questions around manhood towards Macbeth and Macduff from their wives because of their decisions.                                                                                             |

## Plot Summary



SCAN ME

<https://www.youtube.com/watch?v=NmMAO82R8Cg&list=PLqGfSwf4P-tCMp89CQvaU5scuYI>

CLICK ME

Or



SCAN ME

<https://www.bbc.co.uk/bitesize/topic/zgq3dmn>

CLICK ME

Or

## How to structure your answer

### How to structure your answer:

**Point:** Use the words from the question and include a method used by the writer.

**Evidence:** For example/ This is seen when '...'

**Technique/Analysis:** This word/method '...' implies... Furthermore, the word '...' is crucial because...

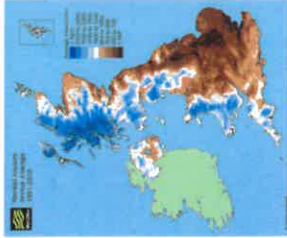
**Link (AO3):** This could represent/symbolise the ... in society/it may represent Dickens view that...

**Literature Paper 1, Section A**  
- Extract question. 45 minutes.



## UK Physical Characteristics

- Most mountains are located in the **north and west**, such as Wales and Scotland.
- These areas have **few roads and settlements** but beautiful scenery. – Sparsely populated.
- South and east** of the UK is **flat** with a few hilly areas.
- These areas are suited for **settlements, roads and railways** – Densely populated.
- Rivers flow from mountainous areas down to the sea.



### UK Rainfall Patterns

- Highest rainfall is in the north and west** where average rainfall is **2500mm**.
- Lowest rainfall is in the south and east** with average rainfall of **500 – 625mm**.

### UK Relief Rainfall

Most UK rainfall is caused by **prevailing wind** blowing from the southwest.

When air carrying moisture reaches upland areas, it is **forced up** to produce **relief rainfall**.

The other side of the upland area has **little moisture**, this is called the **rain shadow**.



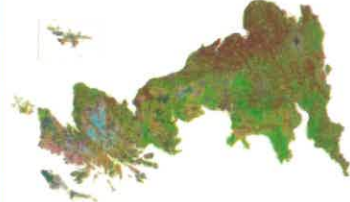
### Water stress in the UK

**Water stress is when areas have limited water supply.**

| Problems                                                                                                                                                                                                                                                                                 | Solutions                                                                                                                                                                                                                                                                                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>Most rainfall occurs in <b>North &amp; West</b> but least rainfall in <b>South &amp; East</b>.</li> <li>South &amp; East UK therefore have <b>High demands</b>.</li> <li>Demands involve domestic, industrial &amp; agricultural uses.</li> </ul> | <ul style="list-style-type: none"> <li>Water can be <b>transferred</b> from the wetter west to drier east by <b>pipelines</b> or rivers.</li> <li>Construct <b>new reservoirs</b> in the east to <b>capture/store</b> more water.</li> <li>Greater <b>water conservation</b>.</li> </ul> |

## Land use in the UK

Land use varies throughout the UK. However our land is always **changing**. Nonetheless, the vast majority of the UK is **farmland**.



**UK mountain areas** (Scotland) have rough pastures and moorlands. The climate is harsh and soil is poor for crops

**Grasslands** are found in the west. It is ideal for cattle and sheep because of the mild and wet climate.

| Grasses | 52% |
|---------|-----|
| Arable  | 20% |
| Urban   | 14% |
| Forest  | 12% |
| Water   | 1%  |
| Other   | 1%  |

**Arable farmland** dominates because of the warm, sunny and dry climate. Crops such as cereals and vegetables are found in the South and East.

**Coniferous woodland** are found in northern England, Wales and Scotland. There areas have poor soils and are remote.

**Urban areas** are growing. This outward growth or sprawling urban developments is caused by population growth.

## Topic 7

# UK in the 21<sup>st</sup> Century

## Population in the UK

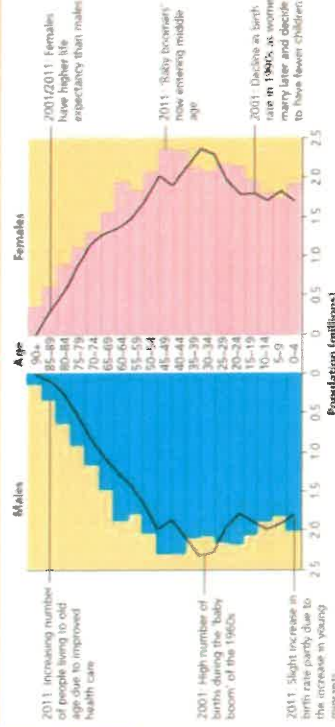
The UK population is **65 million** and still rising. It is predicted to reach **70 million** by **2030**.

### Reasons for growth

**Natural increase** – the difference between deaths and births.  
**Net migration** – the difference between immigration to the UK and emigration from the UK.  
**Life expectancy** – the average age someone will live up to.

### Future of growth

The UK's **population pyramid** shows that the country's birth rate is fairly low and death rate is also low meaning there are more elderly people.  
**Population pyramids** are useful to help plan for the future.



## UK Population Distribution

### Low

Much of Northern Scotland is **sparse** due to a **mountainous landscape** and **difficult climate**.

### High

Rest of the UK because of the **gentle hills, moderate climate** and **good transport routes**.

### Very High

Population is **concentrated** around the South East of England, in cities such as London, due to attractions of **employment, shops and entertainment**.

## Factors affecting population density

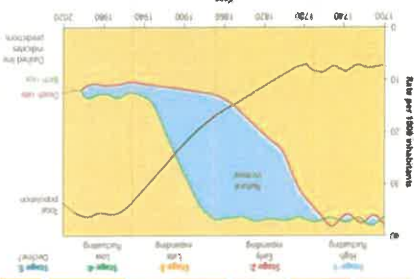
| Moderate climate.            | Remote and poor communications. | Opportunities for work            |
|------------------------------|---------------------------------|-----------------------------------|
| A presence of raw materials. | Steep and mountainous.          | Fertile and suitable for farming. |
| Poor quality of soil.        | Plentiful supplies of water.    | Flat land for farming.            |
| UK Housing Shortage          |                                 |                                   |
| Problem and Reasons          |                                 |                                   |

- The UK **population** is rising and therefore **more houses are needed**.
- UK needs to build **240,000 homes a year**, but only half that are built.
- As a result, **house prices** are rising and becoming too expensive.
- Planning permission for new houses leads to **local opposition**.
- Green belt areas** prevents urban areas becoming bigger.
- The **price of lands** keeps rising due to demand.

## Demographic Transition Model (DTM)

As countries experience economic development they also go through **stages of population transition**. The DTM describes this change and shows the UK in stage 4.

| 1 | Birth rates high and death rates fluctuates.                                   |
|---|--------------------------------------------------------------------------------|
| 2 | Birth rate high but death rate is falling rapidly. Natural change increases.   |
| 3 | Birth rate and death rate falling rapidly. Natural change is rapid.            |
| 4 | Birth rate and death rate is low and fluctuating. Little Natural changes.      |
| 5 | Birth rate is falling and death rate is rising slightly. Natural change falls. |





| Ethnic Diversity in Bristol |                                                                                                                                                                                                                         |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| •                           | Bristol is a youthful city with 16-24 years old being the most common age range. This is due to the University and Bristol attracting jobs from that age range.                                                         |
| •                           | The ethnic make up of Bristol remains mostly White British however this % is decreasing. The BAME population has doubled since 2001 from 6% to 12%. The majority of the BAME population live in or near the inner city. |

| UK Ageing Population              |  |
|-----------------------------------|--|
| Distribution of Ageing Population |  |

|                                                                                                                                                                                                                                    |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Around 18% of the population are over 65. The distribution of older people is high in coastal areas, especially in east and south-west England. However, it is lower in Northern Ireland and Scotland and generally in big cities. |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|

| Causes | <ul style="list-style-type: none"> <li>Large number of people were born after the WW2 and are now moving into old age – Baby boomers.</li> <li>Improved healthcare and new treatments to prolong life.</li> <li>Greater awareness of the benefits of a good diet and exercise.</li> </ul> |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Effects | <ul style="list-style-type: none"> <li>Healthcare cost are very high and will increase with an increasing ageing population.</li> <li>Shortage of places in care homes, many of which are becoming increasingly expensive.</li> <li>Many older people join clubs and spend on travel therefore helping to boost the economy – the grey pound.</li> </ul> |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Response | <ul style="list-style-type: none"> <li>Government pension bonds to encourage older people to save money for the future.</li> <li>Pensioners receive support in care, transport and heating allowance to make life more comfortable.</li> <li>Allowing more immigration will provide the demand needed of a younger workforce needed for the economy.</li> </ul> |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| UK's Changing Economy |                                                                                                    |
|-----------------------|----------------------------------------------------------------------------------------------------|
| •                     | UK has one of the largest economies in the world.                                                  |
| •                     | The last few decades, heavy manufacturing industries have declined due to competition from abroad. |
| •                     | Now the UK is moving into the service industry such as finances, technology and media.             |

| Political Changes | <ul style="list-style-type: none"> <li>Between 1997-2007, the UK economy grew strongly &amp; unemployment decreased. This was due to increase investment in education &amp; technology.</li> <li>In 2008 the UK entered a recession and unemployment increased. Recession ended in 2009, creating a strong focus for decreasing the national debt occurred in 2010 elections.</li> </ul> |
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|-------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| UK Employment Sector   |                                                                                   |
|------------------------|-----------------------------------------------------------------------------------|
| Key changes since 2001 |                                                                                   |
| •                      | The quaternary industry has increased, whilst secondary has decreased.            |
| •                      | Number of people employed in primary and tertiary industry has stayed the steady. |
| •                      | Big increase in professional and technical jobs.                                  |
| •                      | Employment in manufacturing has decreased the most due to cheap labour abroad.    |

| UK Working Hours |                                                                  |
|------------------|------------------------------------------------------------------|
| •                | In 2011 the average number of hours worked in the UK was 42.7.   |
| •                | This figure is the 3 <sup>rd</sup> highest figure within the EU. |
| •                | Fathers now work fewer hours to look after children.             |
| •                | Number of mothers in fulltime work has increased.                |

| UK's Core Economic Hubs                                                                                                                                                                                         |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| An economic hub is a central point or area associated with economic success and innovation. Many of these economic hubs are located near universities. Below is a selection of economic hubs throughout the UK. |  |

|                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Belfast Titanic Quarter</b><br/>Film studio, offices and education based on the old shipyard.</p> <p><b>Salford</b><br/>Media industry including BBC and ITV.<br/>Manufacturing of chemicals.</p> <p><b>Bristol</b><br/>Creative and digital industries. Key services such as law and finance.</p> | <p><b>Aberdeen</b><br/>Centre for the North Sea oil and gas industry, now developing as a research and development hub.</p> <p><b>Silicon Glen</b><br/>High-tech industries based in key Scottish cities. They focus on electronics and software.</p> <p><b>Silicon Fen</b><br/>High tech research hubs associated with Cambridge University.</p> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| Case Study: UK Economic Hub - Bristol                                                                            |  |
|------------------------------------------------------------------------------------------------------------------|--|
| Bristol has the 2 <sup>nd</sup> fastest growing economy in the UK. It is the economic capital of the south west. |  |

| Change Over Time                                                                                                                 | Significance to the UK                                                                                                                                                                    |
|----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| An Enterprise Zone and Science Park have been developed in Bristol which increases jobs and attracts top businesses to the city. | The development of the port means that 25% of British fuels are imported here, and 10,000 jobs depend on the business located in the port which contributes £1billion to the UK economy.. |

| The UK's Role in the World                                                                                                                              |                                                                                                                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| The UK may be a small island state, but it does play a significant role in the wider world. It is also part of several key international organisations. |                                                                                                                             |
| NATO                                                                                                                                                    | UN                                                                                                                          |
| A group of 28 countries who work militarily and politically to resolve conflict as a last resort.                                                       | Is made up of 193 member states with the aim of maintaining peace and resolving issues. UK is part of the Security Council. |
| G7                                                                                                                                                      | Involves seven of the wealthiest western countries to discuss relevant issues and come to economic agreements.              |

| Case Study: The UK in Resolving Conflict in Middle East |          |
|---------------------------------------------------------|----------|
| Basic Background                                        | Success? |

|                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| AS part of NATO, the UK joined forces with the USA to remove the Taliban from power in Afghanistan. This is because the NATO powers felt they were at threat from terrorism. Once the Taliban fell, the UK sent troops into Afghanistan to maintain peace and provide the Afghan government with support. | The UK forces did allow for the afghan government to set up new infrastructure for the country however In 2021, the UK and US forces withdrew from Afghanistan and consequently the Taliban have regained control of the country. |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

| UK Involvement |                                                                                 |
|----------------|---------------------------------------------------------------------------------|
| •              | The UK, as part of NATO, sent troops and the RAF to neighbouring countries.     |
| •              | In 2015, the UK gave £15 million in aid to Ukraine as well as military support. |

| UK Media Exports        |                                                                                                      |
|-------------------------|------------------------------------------------------------------------------------------------------|
| •                       | The UK exports many different types of media products such as films, TV and music and books.         |
| •                       | Exporting media is key to the UK economy as it employs 1.7 million people and generates £17 billion. |
| •                       | Example: Harry Potter sold 400 million copies to 200 territories.                                    |
| UK's Media's influences |                                                                                                      |
| •                       | Most exports are in English, meaning it develops other's understanding of our language.              |
| •                       | Many people around the world copy fashion & styles seen in UK media.                                 |
| •                       | Can attract people to visit the UK.                                                                  |

| Multicultural UK                                                                                                                                                                                                                   |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| The UK is a multicultural country due to many ethnic minorities moving here from India, Pakistan, Caribbean and parts of Africa. These groups have shared there culture and have influenced the UK in many ways especially in food |  |

| Food                                                                                                                      |  |
|---------------------------------------------------------------------------------------------------------------------------|--|
| Food that has originated from other countries have become very established (i.e. and Pizza).                              |  |
| Many mainstream supermarkets sell a great range of ingredients and ready made foods from other cultures.                  |  |
| In Birmingham, the Balti triangle has become a famous tourist attraction known for serving the best Balti in the country. |  |
| The Chicken Tikka Masala is a dish that combines the cultures of India and the UK (the dish was invented in Scotland)     |  |



### What is Resource Reliance?

Resources are things that humans require for life or to make our lives easier. Humans are becoming increasingly dependent on exploiting these resources, and as a result they are in high demand.

### Resource Required

Resources such as food, energy and water are what is needed for basic human development.

| FOOD                                                                                                                                                   | WATER                                                                                                                                             | ENERGY                                                                                                                                                           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Without enough nutritious food, people can become malnourished. This can make them ill. This can prevent people working or receiving education.</p> | <p>People need a supply of clean and safe water for drinking, cooking and washing. Water is also needed for food, clothes and other products.</p> | <p>A good supply of energy is needed for a basic standard of living. People need light and heat for cooking or to stay warm. It is also needed for industry.</p> |

### Demand outstripping supply

The demand for resources like food, water and energy is rising so quickly that supply cannot always keep up. Importantly, access to these resources vary dramatically in different locations

### 1. Population Growth

- Currently the global population is 7.3 billion.
- Global population has risen exponentially this century.
- Global population is expected to reach 9 billion by 2050.
- With more people, the demand for food, water, energy, jobs and space will increase.

### 2. Economic Development

- As LDCs and EDCs develop further, they require more energy for industry.
- LDCs and EDCs want similar lifestyles to ACs, therefore they will need to consume more resources.
- Development means more water is required for food production as diets improve.

### Resource Reliance Graph

Consumption – The act of using up resources or purchasing goods and produce.

Carry Capacity – A maximum number of species that can be supported.

Resource consumption exceeds Earth's ability to provide!

### 3. Changing Technology and Employment

The demand for resources has driven the need for new technology to reach or gain more resources.

More people in the secondary and tertiary industry has increased the demand for resources required for electronics and robotics.

### Reasons for NOT Meeting Modern Resource Demands.

|                 |                                                                                                                                                                                                                                                                                                       |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Climate         | <ul style="list-style-type: none"> <li>Global warming effects cycles and seasons and therefore farming.</li> <li>Rainfall patterns are changing and are becoming unpredictable. This is a problem for farming.</li> </ul>                                                                             |
| Geology         | <ul style="list-style-type: none"> <li>Not all countries have access to fossil fuels or suitable landscape for renewables.</li> <li>Many minerals are finite and therefore once used will reduce the resources available.</li> <li>Rock types might limit the availability to store water.</li> </ul> |
| Conflict        | <ul style="list-style-type: none"> <li>War can disrupt transport of resources by damaging roads and water pipes.</li> </ul>                                                                                                                                                                           |
| Poverty         | <ul style="list-style-type: none"> <li>LDCs are unable to afford technology to effectively exploit the natural resources available.</li> </ul>                                                                                                                                                        |
| Natural Hazards | <ul style="list-style-type: none"> <li>Increase in hazard events due to climate change.</li> <li>Prime agricultural regions in Asia and Africa and are also in hazard zones.</li> <li>Has the ability to destroy infrastructure needed to transport resources.</li> </ul>                             |

## Topic 8

# Resource Reliance

### Environment and Food: Fishing and Farming

| Methods                                                                                                             | Environmental and Ecosystems                                                                                                                                                                                                           |
|---------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Bigger nets and fishing boats have allowed for greater catches. GPS and sonar has also find the fish easily.</p> | <ul style="list-style-type: none"> <li>Overfishing of certain fish has caused their decline.</li> <li>Dredging can damage seafloor habitats.</li> <li>Decline of one species has a knock on effect on other marine species.</li> </ul> |

| Methods                                                                                                            | Environmental and Ecosystems                                                                                                                                                                                                                         |
|--------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Tractors, computer programming and GPS technology is producing food more effectively and at a larger scale.</p> | <ul style="list-style-type: none"> <li>Field sizes have caused hedgerows to decline in biodiversity.</li> <li>Fertilisers and pesticides enter water courses and harm or kill organisms.</li> <li>Heavy machinery can cause soil erosion.</li> </ul> |

### Environment and Energy: Deforestation and Mining

| Methods                                                                                                           | Environmental and Ecosystems                                                                                                                                                                                                                                                                     |
|-------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Logging using modern machinery and transportation has made deforestation more productive &amp; convenient.</p> | <ul style="list-style-type: none"> <li>2 billion people depend on wood for fuel, which therefore creates high CO2 emissions</li> <li>Forests provide for important habitats.</li> <li>Clearing of forests leads to soil erosion.</li> <li>Tree intercepts rain and prevents flooding.</li> </ul> |
| <p>Large machines and drill technology can remove and reach through material effectively.</p>                     | <ul style="list-style-type: none"> <li>Mining waste can pollute soil and contaminate water supplies.</li> <li>Habitats are destroyed in mining zones.</li> <li>Fossil fuels burnt release greenhouse gases</li> </ul>                                                                            |

### Environment and Water: Reservoirs and Water Transfer

| Reservoirs     | Methods                                                                                                                               | Environmental and Ecosystems                                                                                                                                                                                                                                                                            |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                | <p>Increasing storage to hold more water and constructing more dams to control river flow can provide a reliable source of water.</p> | <ul style="list-style-type: none"> <li>Can flood a large area of land and damage habitats and natural landscapes.</li> <li>Dams can be a barrier for certain species to migrate upstream.</li> <li>Natural flow of sediment is disrupted, which then reduces fertility of land further down.</li> </ul> |
| Water Transfer | <p>Constructing pipes and canals to divert water surplus to areas in need of a water supply.</p>                                      | <ul style="list-style-type: none"> <li>Large-scale engineering works can damage ecosystems along the route.</li> <li>Lots of energy is required to pump water over long distances.</li> </ul>                                                                                                           |

### Food Security

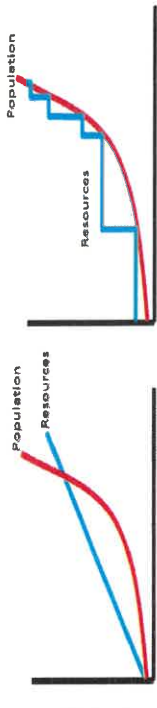
'Food Security' is when people at all times need to have physical & economic access to food to meet their dietary needs for an active & healthy life. This is the opposite to 'Food Insecurity' which is when someone is unsure when they might next eat.

| Human                                                                                                                                                                                                                                                                                                                                                                                                              | Physical                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>Poverty prevents people affording food and farmers buying modern equipment.</li> <li>Poor infrastructure makes food difficult to transport fresh food.</li> <li>Conflict disrupts farming and prevents supplies.</li> <li>Food waste due to poor transport and storage.</li> <li>Climate Change is affecting rainfall patterns making food production difficult.</li> </ul> | <ul style="list-style-type: none"> <li>Temperature needs to be ideal for certain crops to grow.</li> <li>The quality of soil is important to ensure crops have the necessary nutrients.</li> <li>Water supply needs to be reliable to allow food to grow.</li> <li>Pest, diseases and parasites can destroy vast amounts of crops that are necessary to feed large populations.</li> <li>Extreme weather events can damage crops (i.e. floods).</li> </ul> |

Malthus and Boserup's Theories about Food Supply

With the population growing very quickly, there are different ideas about whether or not this will lead to a food crisis.

| Malthus Theory                                                                                                                                                                                                                                                                                                                           | Boserup Theory                                                                                                                                                                                                                                                                                          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>Believed that population would increase faster than food supply. This would lead to a lack of food being available.</li> <li>Malthus believed this would cause large scale famine, illness and war</li> <li>This would occur until population returned to level that can be supported.</li> </ul> | <ul style="list-style-type: none"> <li>Believed that however big the population grew, people would find ways to manage.</li> <li>If food supplies became limited, people would find new ways to increase production.</li> <li>These solutions would often involve creating new technologies.</li> </ul> |

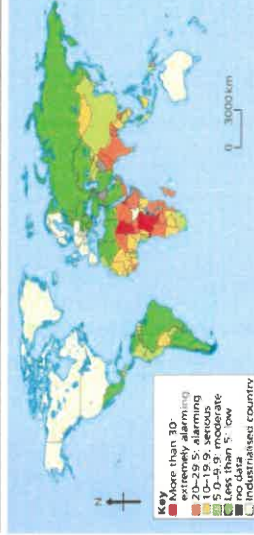




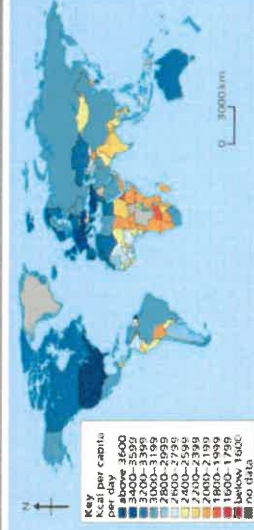
## Measuring Food Security

Food security varies around the world. Some people and places are more food secure than others. This can often depend on how much a country can grow and is able to afford.

### The Global Hunger Index



### Daily Calorie Intake



- This shows how many people are suffering from **hunger or illness** caused by lack of food.
- The index gives a value for each country from **0** (no hunger) to **100** (extreme hunger).

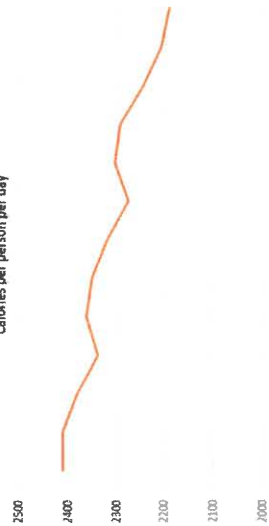
- This shows how many **calories per person** that are consumed on average for each country.
- This can indicate the global distribution of **available food and food inequality**.

## Case Study: UK Food Security

### Food Availability in the UK

- The UK population is around **65 million** and enjoys a **high level of food security**.
- The UK produces **68% of its own food** but this is steadily decreasing.
- The UK has to **import** the rest, especially seasonal food such as fruit and vegetables.
- Food production in the UK has increased by **intensifying agriculture**.

Average consumption of food and drink by UK residents  
Calories per person per day



### Effectiveness of past attempt at food security

- Intensification of farming from **1940s** to the **1980s** attempted to increase production by:
  - Higher yields of crops and animals
  - Monoculture by growing one crop in a large area.
  - Irrigation with better groundwater pumping.
  - Chemicals with improved fertilisers and pesticides.
  - Mechanisation for sowing and harvesting.

### Effectiveness of present attempts at food security

- Recently the UK has been promoting sustainable intensification, involving food security and supporting the environment.
  - New technology such as **hydroponics** help a range of foods to be grown all year round.
  - However, this method is **expensive** for producer and consumer.

## Attempts to Achieve Food Security

There are various measures to maintain or even improve our food security. These measures are often taken to be **socially, economically, environmentally** viable for the longer term.

| Social              | Economic | Environmental |
|---------------------|----------|---------------|
| Ethical Consumerism |          |               |

This involves buying products that have a **positive social, economic and environmental** impact today, **without compromising future generations**.

- |                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Fairtrade</b> <ul style="list-style-type: none"> <li>This is a global movement to give farmers a <b>fairer price for their products</b>.</li> <li>The profits benefit the community <b>with schools and medical facilities</b>.</li> <li>Involves using farming methods that <b>protects rather than destroys environments</b>.</li> </ul> | <b>Food Waste</b> <ul style="list-style-type: none"> <li>One-third of all food gets lost or wasted.</li> <li>Aim to <b>eat locally sourced food</b> to reduce waste through transport.</li> <li>Eating 'ugly' food despite it not being 'ideal' can prevent waste and <b>save money</b>.</li> <li>Prevents wasted energy for producing food and therefore <b>reduces CO2 emissions</b>.</li> </ul> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Food Production

This involves producing as much food as possible in as small a space as possible. They often involve using machines and chemicals to gain as much produce as they can.

- |                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Intensive Farming</b> <ul style="list-style-type: none"> <li>Makes the most of the land and allows for higher yields. This can make growing food more <b>productive and therefore cheaper</b> to produce.</li> <li>Chemical fertilisers, pesticides and herbicides can <b>pollute the environment and harm people, animals and insects</b>.</li> </ul> | <b>Organic Methods</b> <ul style="list-style-type: none"> <li>This involves the banned use of chemicals and <b>ensuring animals are raised naturally</b>.</li> <li>This can lead to <b>lower yields of 20%</b> and products being <b>more expensive</b>.</li> </ul> |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Technological Developments

Through better understanding of science and improved technology, it is now possible to change the food we grow and protect and harvest the crops more effectively.

- |                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Genetically modified (GM)</b> <ul style="list-style-type: none"> <li>Involves changing the DNA of foods to enhance their productivity and properties.</li> <li>Crops can be <b>better protected from disease and drought</b>, but also made larger or include more <b>health benefits</b>.</li> </ul> | <b>Hydroponics</b> <ul style="list-style-type: none"> <li>This is a method of growing plants without soil. Instead they use nutrient solution.</li> <li>Less water is needed and a <b>reduced need for pesticides</b> to be used.</li> <li>However, this method is <b>very expensive</b> so only used for high value crops.</li> </ul> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## Small Scale 'Bottom Up' Approaches

This involves a **small scale production of food** and relies on individuals and communities, rather than government or large organisations.

- |                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Allotments</b> <ul style="list-style-type: none"> <li>This is an area of land that is divided into plots and rented to <b>individuals to grow their own fruit and vegetables</b>.</li> <li>Allows people in urban areas to produce their <b>own cheap &amp; healthily food</b> close to home.</li> </ul> | <b>Permaculture</b> <ul style="list-style-type: none"> <li>This involves <b>people growing their own food</b> and <b>changing their eating habits</b>.</li> <li>This can create <b>more natural ecosystems</b> and fewer resources are required.</li> </ul> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



## Enquiry: What were the key Cold War crises? 1958-70

**Outline:** At the height of the Cold War, both sides were involved in a series of tense events where they challenged each other in Berlin, Cuba and Czechoslovakia. These three crises fundamentally changed the relationship of the USA and the Soviet Union as they vied for supremacy during the Cold War.

| Date | Event                                | What happened                                                                                                               |
|------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| 1958 | Khrushchev's Berlin Ultimatum        | Khrushchev demanded that Berlin become a free city with no western troops. He aimed to then annex Berlin into East Germany. |
| 1959 | Castro became leader of Cuba         | The communist Cuban revolution scared the USA as it was so close to the USA.                                                |
| 1960 | Agreement with Castro and Khrushchev | The Soviet Union agreed to send arms in return for trade with Cuba.                                                         |
| 1961 | Bay of Pigs invasion                 | Kennedy tried to force Castro out of Cuba, but this backfired spectacularly.                                                |
| 1961 | Berlin Wall construction began       | The large number of East Germans crossing into West Berlin led to the wall being constructed.                               |
| 1962 | Cuban Missile Crisis                 | USA and USSR came to the brink of nuclear war over Soviet missiles on Cuba.                                                 |
| 1963 | Kennedy visit to West Berlin         | Kennedy wanted to show support for West Berlin and a signal of hope to those in the East who wanted freedom.                |
| 1963 | Telephone hotline                    | Kennedy and Khrushchev agreed to improve communication through a direct line.                                               |
| 1968 | Prague Spring                        | Dubcek tried to bring more freedom to Czechoslovakia but was stopped by the Soviets.                                        |

## History – GCSE

### Knowledge Organiser

#### Topic 5



#### Key individuals.

**Nikita Khrushchev.** Leader of The USSR after Stalin. He wanted to assert Soviet power and clashed with Kennedy in Berlin and Cuba. He was replaced by Brezhnev in 1968.



**John F. Kennedy.** President of the USA from 1961-1963. He was seriously tested by the USSR and emphasised the USA's role as a force for democracy in the world by visiting Berlin.



**Fidel Castro.** Led the Communist Cuban revolution which scared the USA. Allied to the USSR to try and prevent American interference in Cuba. This led to the Cuban Missile Crisis.



#### Key vocabulary:

**Arms race:** competition between the USA and USSR to have the most weapons to prove their superpower status.

**Berlin Wall:** border constructed between East and West Berlin to stop East Berliners fleeing to the West. It was 165 km long.

**Blockade:** to prevent supplies from reaching a city or a country.

**Brezhnev Doctrine:** The Soviet leader's message that communist countries wouldn't be allowed to reform to become more liberal.

**Brinkmanship:** when leaders play a political game which leads both sides to the edge of conflict before one backs down first.

**CIA:** American government's intelligence organisation which runs a spy network abroad.

**Censorship:** the banning of certain ideas or messages, often by the government controlling the media.

**Doves:** those who tried to avoid all-out war during the Cold War.

**ExComm:** Kennedy's team who were summoned during the 13 days of the Missile Crisis to plan America's response.

**Free city:** a city with its own independent government. Although Khrushchev promised this for Berlin, he was lying.

**Hawks:** Those who supported going to war during the Cold War.

**Nationalist:** someone who doesn't want other countries interfering in their country's affairs.

**Non-proliferation:** stopping the spread of something, usually weapons.

**Proxy war:** a war fought indirectly between countries, often in another country.

**Refugees:** people fleeing their home country, usually due to war.

**Revolution:** an armed uprising to take power which is often violent.

**Secretary of State:** American official in charge of foreign policy for the president.

**Summit:** a meeting between world leaders.

**U-2 spy plane:** used by the Americans to take pictures and spy on the enemy. One of these spotted the missiles on Cuba.

**Ultimatum:** a final demand, often backed up by a threat to take action.





## Enquiry: What were the key Cold War crises? 1958-70

### Key facts on the Berlin Wall:

Life in East Germany in the 1950s was harsh  
With shortages of basic food.

East Berliners rioted in 1953 and many tried to leave for West Berlin.

By 1958, 3 million East Germans (1/6 of the population) had crossed to the West.

27 November 1958, Khrushchev issued the Berlin Ultimatum. And gave the West 6 months to respond.

May 1959 Geneva summit failed to agree on Berlin.

September 1959 Camp David summit with Eisenhower led to the Ultimatum being withdrawn.

May 1960 Paris talks ruined by U-2 spy plane incident. Pilot Gary Powers was interrogated.

June 1961 Vienna talks saw the Ultimatum come back but Kennedy refused to back down. Kennedy increased US war spending by \$2 billion.

One day in August 1961, 40,000 East Berliners crossed to the West. East German leader Walter Ulbricht asked Khrushchev to close the border = 12 August 1961 the barbed wire fence went up overnight. 165km concrete wall built. 27 mile section in the centre has two walls with no-man's land.

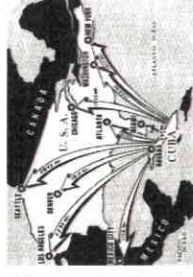
130 people were killed trying to cross the Wall. Peter Fechter died in August 1962.

June 1963 – Kennedy visited West Berlin to a raptors welcome = "Ich bin ein Berliner" speech 25 June

Crossing points were constructed – most famous was Checkpoint Charlie. They were heavily guarded.



### History – GCSE Knowledge Organiser Topic 5



### Key facts on Czechoslovakia:

1949 and 1954 saw purges of non-communists on Stalin's orders.

1966 student demo against communist control. 1968, Alex Dubcek elected First Secretary of the Czech Communist Party.

Dubcek wanted more freedom so people could speak out and have more fun = "socialism with a human face"

Dubcek's reforms called Prague Spring. Moscow hated them and Brezhnev wanted more control. Romania refused to attend Warsaw pact meetings and Tito in Yugoslavia refused Moscow's control.

Brezhnev ordered Warsaw pact soldiers to carry out manoeuvres.

Dubcek invited Tito and Ceausescu (Romania) to meet him.

20 August 1968, 500,000 Warsaw pact troops invaded and ended the Prague Spring.

Dubcek arrested and sent to Moscow before being sacked in 1969.

Gustav Husak was new leader and started a clampdown.

26 Sept 1968, Brezhnev

Doctrine said Warsaw pact countries had to stick together = no liberal reforms allowed.



### Key facts on the Cuban Missile Crisis:

January 1959 = Cuban Revolution with Fidel Castro and Che Guevara.

US controlled key supplies and raw materials like oil and sugar in Cuba = Eisenhower was worried.

May 1959 Cubans took over all land owned by foreign nationals.

Feb 1960 = Castro and Khrushchev signed a sugar agreement and Castro would get Soviet weapons.

Cuba was 145km from Florida.

July 1960 Eisenhower stopped trade with Cuba and then Jan 1961 stopped diplomatic relations.

CIA planned to help 1,400 anti-Castro Cubans to invade Cuba at Bay of Pigs in April 1961. 20,000 Castro allies fought them off.

Sept 1961 Khrushchev gave public help to Castro.

14 Oct 1962 U-2 spotted nuclear missiles on Cuba.

NATO already had missiles in Turkey.

22 Oct Kennedy started a naval blockade on Cuba. Readied 54 bombers each armed with 4 nuclear warheads.

24 October, Soviet ships turned around to avoid war.

26 October Khrushchev wrote a telegram to Kennedy and then another on 27 Oct = wanted US missiles out of Turkey. U-2 plane shot down over Cuba but Kennedy held back.

28 Oct agreement reached to remove from Cuba. Secret deal involved the weapons being removed from Turkey too.

June 1963 hotline set up

August 1963 Test Ban Treaty

1967 Outer Space Treaty to stop nuclear weapons in orbit.

1968 Non-proliferation Treaty to limit nukes.



### Furthering learning

Want to find out more about Cold War crises?



### Prior learning?

Escalation  
Ideology

Exam question focus: 8 mark importance question.

What was important about...



## Enquiry: Why did the Cold War end? 1970-91

**Outline:** The nuclear arms race made it clear to both sides that they needed to improve their relations during the 1970s. However, key events led to a deterioration during the 1980s when President Reagan took a tougher approach. When Gorbachev became Soviet leader, he realised that the USSR had to change and his actions led to both the end of the Cold war and the break-up of the Soviet Union.

| Date | Event                                        | Impact                                                                     |
|------|----------------------------------------------|----------------------------------------------------------------------------|
| 1972 | SALT 1 signed                                | Détente established by an agreement to reduce missiles.                    |
| 1975 | Helsinki Accords                             | Agreements over borders, cooperation and human rights.                     |
| 1979 | SALT 2 signed<br>Invasion of Afghanistan     | End of détente which led to a second Cold War.                             |
| 1983 | Reagan announced SDI                         | New space laser system which would make Soviet missiles useless.           |
| 1985 | Gorbachev new Soviet leader                  | He promised a new era where the USSR would not help communist governments. |
| 1986 | Reykjavik Summit                             | Reagan and Gorbachev met and built a strong relationship.                  |
| 1989 | Hungary opened border<br>Fall of Berlin Wall | Eastern Europe broke free from Soviet control and influence.               |
| 1990 | East and West Germany united                 | Signified the end of Soviet control and power in Europe.                   |
| 1991 | Gorbachev resigned<br>Soviet union ended     | End of the Cold War                                                        |



## History – GCSE Knowledge Organiser Topic 6



### Key individuals.

**Mikhail Gorbachev.** Leader of the USSR after 1985. He wanted to reform the USSR and his policies led to the break-up of his country.



**Ronald Reagan.** President of the USA from 1981. He took a tough approach to the Soviet Union which created flashpoints at the end of the Cold War.



**Helmut Kohl.** Leader of West Germany who organised the unification with East Germany to make Germany one country again.



### Key vocabulary:

**Abdicate:** step down from power or office.

**ABM:** Anti-ballistic missiles which could intercept ICBMs.

**Accords:** an agreement between countries; not as binding as a treaty.

**Arms race:** competition between the USA and USSR to have the most weapons to prove their superpower status.

**Berlin Wall:** border constructed between East and West Berlin to stop East Berliners fleeing to the West. It came down in 1989.

**Coup:** political plot to remove a leader from a country.

**Détente:** a period of peace between two groups who used to be hostile.

**Doves:** those who tried to avoid all-out war during the Cold War.

**Economic sanctions:** a way to harm a country's economy so they are forced to change their behaviour, like a ban on trade.

**Fundamentalist:** someone with an extreme uncompromising approach to an ideology, especially religion.

**Glasnost:** Russian for "openness" which was Gorbachev's new attitude to foreign relations.

**Hawks:** Those who supported going to war during the Cold War.

**ICBM:** Inter-continental ballistic missiles

**Interim:** something that is temporary, like a treaty.

**Martial law:** military government with normal laws being suspended.

**Non-proliferation:** stopping the spread of something, usually weapons.

**Ostpolitik:** West German policy to improve relations between West and East Germany.

**Perestroika:** Russian for "reconstruction" which was Gorbachev's policy to reorganise the USSR.

**Proxy war:** a war fought indirectly between countries, often in another country.

**Ratification:** formal approval of something, like a treaty.

**Revolution:** an armed uprising to take power which is often violent.

**SALT 1/ SALT 2:** Strategic Arms Limitation Treaty which reduced weapons.

**SDI:** Strategic Defense Initiative to shoot down Soviet missiles.

**Shah:** emperor or king in Iran

**SLBM:** submarine launched ballistic missiles.

**Summit:** a meeting between world leaders.



## Enquiry: Why did the Cold War end? 1970-91

### History – GCSE Knowledge Organiser

#### Topic 6

#### Key facts on the reduction in tension:

1970s saw attempts to reduce tension = détente.

USA had lost in Vietnam and faced domestic problems so wanted progress with the USSR. USSR faced economic problems so wanted to slow down arms race.

May 1972: SALT 1 signed to reduce nuclear weapons.

President Nixon visited Brezhnev in Moscow and then Brezhnev came to Washington in 1973.

1975 Helsinki Accords saw agreements in three "baskets"

Basket 1 was about respecting European borders, Basket 2 was international cooperation and Basket 3 concerned human rights.

SALT 2 in June 1979 was signed by President Carter and Brezhnev but it wasn't ratified by the USA because the USSR invaded Afghanistan in 1979.

Tension also increased due to Soviet support for communists in central America (Nicaragua and El Salvador).

USA also humiliated by the November 1979 Tehran hostage crisis in Iran.

USSR invasion of Afghanistan ended détente.



#### Prior learning?

Escalation  
Ideology

| NUCLEAR LIMITS |       |
|----------------|-------|
| USA            | 300   |
| USSR           | 300   |
| ALMA           | 1,000 |
| ICMA           | 1,500 |
| MASSIMIAN      | 1,500 |
| NUCLEAR        | 42    |



#### Key facts on the flashpoints in relations:

Second Cold War. In 1979, the Shah of Iran was deposed by Islamic fundamentalists.

Afghanistan was now seen as a buffer zone between USSR and Iran as the USSR wanted to stop the spread of Islam.

1979, the pro-Soviet leader of Afghanistan was deposed. The new leader, Amin was supported by the Soviets but under threat of a pro-Muslim takeover so Amin looked to the USA for help.

24 December 1979, USSR invaded Afghanistan, claiming Amin wanted this. Amin assassinated on 27 December and replaced by pro-Soviet Kamal. Soviets stayed fighting there for ten years.

Carter withdrew from SALT 2 and his Doctrine said USA would protect US interests in the Persian Gulf by force.

Carter sanctions on the USSR and send funds to the mujahideen.

USA boycotted 1980 Olympics in Moscow with 60 other nations.

USSR led a boycott of 15 countries in the 1984 LA Olympics.

President Reagan called the USSR an "evil empire" in 1983.

USA increased military spending by 13% in 1982 and 8% more in 1983 and 1984.

New weapons were Trident submarines and Stealth bombers.

Reagan Doctrine: USA support anti-communist governments and anti-communist groups to overthrow communist governments.

USA helped rebels in Nicaragua and El Salvador.

US invaded Grenada to topple the communist government.

Strategic Defense Initiative in 1983 (Star Wars) planned satellites to carry lasers to shoot down missiles = turning point.



#### Key facts on the collapse of Soviet control:

USSR had run of poor leaders in early 1980s like Andropov and Chernenko.

Gorbachev was new Soviet leader in 1985 and wanted to reform. Unrest across Eastern Europe due to low living standards. USSR also short of money.

Soviet troops threatened to invade Poland to restore order.

Secret police kept tight control (Stasi in East Germany)

Gorbachev dropped the Brezhnev Doctrine and started Glasnost and Perestroika.

Reagan realised Gorbachev could be an ally.

Geneva summit 1985 = friendship.

Reykjavik Summit Oct 1986 = better relations.

Washington Summit Dec 1987 = INF Treaty to abolish land missiles of 500-5,500 km

Moscow Summit 1988 = USSR to leave Afghanistan

Malta Summit 1989 = end of Cold War

October 1989 – Hungary had free elections.

Nov 1989 – Velvet Revolution in Czechoslovakia

9 Nov 1989 = Berlin Wall came down.

Dec 1989 – dictator Ceausescu overthrown.

1990 = free elections in Bulgaria.

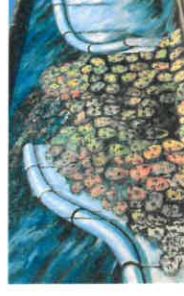
1990 – East and West Germany united.

Dec 1990 = Yugoslavia broke up into separate countries.

Latvia, Estonia and Lithuania declared independence in 1990

Warsaw Pact ended in 1991.

Attempted coup against Gorbachev in Aug 1991. Boris Yeltsin protected him, but Gorbachev was weakened and resigned on 25 Dec 1991. USSR broke up.



#### Furthering learning

Want to find out more about the end of the Cold War?



Exam question focus: 8 mark account question.

Write a narrative account of...



# YEAR 10 — PROPORTION...

## Ratios and fractions

@whisto\_maths

### What do I need to be able to do?

By the end of this unit you should be able to:

- Compare quantities using ratio
- Link ratios and fractions and make comparisons
- Share in a given ratio
- Link Ratio and scales and graphs
- Solve problems with currency conversions
- Solve 'best buy' problems
- Combine ratios

### Keywords

**Ratio:** a statement of how two numbers compare

**Equivalent:** of equal value

**Proportion:** a statement that links two ratios

**Integer:** whole number, can be positive, negative or zero

**Fraction:** represents how many parts of a whole.

**Denominator:** the number below the line on a fraction. The number represent the total number of parts.

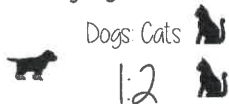
**Numerator:** the number above the line on a fraction. The top number. Represents how many parts are taken

**Origin:** (0,0) on a graph. The point the two axes cross

**Gradient:** The steepness of a line

### Compare with ratio R

"For every dog there are 2 cats"



The ratio has to be written in the same order as the information is given

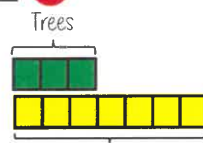
e.g. 2. I would represent 2 dogs for every 1 cat

Units have to be of the same value to compare ratios

### Ratios and fraction R

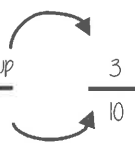
Trees: Flowers

3 : 7



Fraction of trees

Number of parts in group  
Total number of parts



Ratio

Fraction

### Sharing a whole into a given ratio R

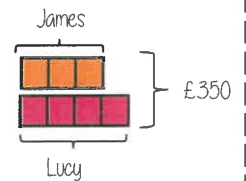
ratio

James and Lucy share £350 in the ratio 3:4  
Work out how much each person earns

Model the Question

James: Lucy

3 : 4



Find the value of one part

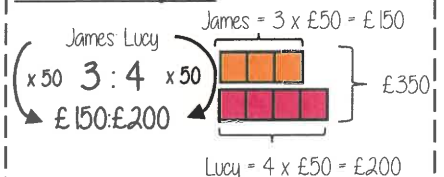
Whole: £350

7 parts to share between  
(3 James, 4 Lucy)

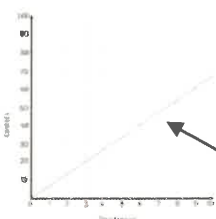
$£350 \div 7 = £50$

□ = one part  
= £50

Put back into the question



### Ratio and graphs R



Graphs with a constant ratio are directly proportional

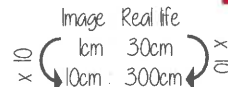
- Form a straight line
- Pass through (0,0)

The gradient is the constant ratio

### Ratio and scale R

A picture of a car is drawn with a scale of 1:30

The car image is 10cm



### Conversion between currencies R



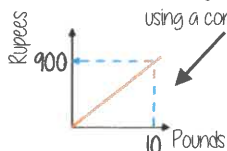
£1 = 90 Rupees

Currency is directly proportional

For every £1 I have 90 Rupees

$\times 10$   
£1 = 90 Rupees  
 $\times 10$   
£10 = 900 Rupees

Currency can be converted using a conversion graph



Convert 630 Rupees into Pounds

$\times 7$   
£1 = 90 Rupees  
 $\times 7$   
£7 = 630 Rupees

$630 \div 90 = 7$

### Best buys



4 pens costs £2.60



10 pens costs £6.00

You could work out how much 40 pens are and then compare.

Compare the solution in the context of the question

The best value has the lowest cost "per pen"

The best value means £1 buys you more pens

£2.60  $\div$  4 = **£0.65**

4  $\div$  2.60 = **154 pens**

£6.00  $\div$  10 = **£0.60**

10  $\div$  6 = **167 pens**

### Ratios in 1:n and n:1

This is asking you to cancel down until the part indicated represents 1

Show the ratio 4:20 in the ratio of 1:n

The question states that this part has to be 1 unit  
Therefore Divide by 4

$4 : 20$   
 $\div 4$   
 $1 : 5$

This side has to be divided by 4 too — to keep in proportion

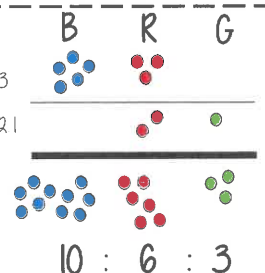
the n part does not have to be an integer for this type of question

### Combining ratios

The ratio of Blue counters to Red counters is 5:3

The ratio of Red counters to Green counters is 2:1

Ratio of Blue to Red to Green



Lowest common multiple of the ratio both statements share

Use equivalent ratios to allow comparison of the group that is common to both statements

# YEAR 10 — PROPORTION...

## Percentages and Interest

@whisto\_maths

### What do I need to be able to do?

By the end of this unit you should be able to:

- Convert and compare FDP
- Work out percentages of amounts
- Increase/ decrease by a given percentage
- Express one number as a percentage
- Calculate simple and compound interest
- Calculate repeated percentage change
- Find the original value
- Solve problems with growth and decay

### Keywords

**Exponent:** how many times we use a number in multiplication. It is written as a power.

**Compound interest:** calculating interest on both the amount plus previous interest.

**Depreciation:** a decrease in the value of something over time.

**Growth:** where a value increases in proportion to its current value such as doubling.

**Decay:** the process of reducing an amount by a consistent percentage rate over time.

**Multiplier:** the number you are multiplying by.

**Equivalent:** of equal value.

### Compare FDP

R

Comparisons are easier in the same format

$\frac{70}{100}$  → This also means  $70 \div 100$  → 70 out of 100 squares → 70 "hundredths" = 7 "tenths" 0.7 → 70 hundredths = 70%

Using a calculator →  $\frac{70}{100}$  → 0.7 → Convert to a decimal →  $\times 100$  converts to a percentage

Be careful of recurring decimals  
 eg  $\frac{1}{3} = 0.3333333$   
 $\frac{1}{3} = 0.\dot{3}$   
 The dot above the 3

### Fraction/ Percentage of amount

R

Find  $\frac{3}{5}$  of £60

$\frac{3}{5}$  of £60 = £36  
 10% of £60 = £6  
 50% of £60 = £30  
 60% of £60 = £36

Remember  $\frac{3}{5} = 60\% = 0.6$   
 $60\% \text{ of } £60 = 0.6 \times 60 = £36$

### Percentage increase/decrease

R

100% → 42% → Decrease by 58%  
 $100\% - 58\% = 42\%$   
 $100 - 0.58 = 0.42$  ← Multiplier Less than 1

100% → 12% → Increase by 12%  
 $100\% + 12\% = 112\%$   
 $100 + 0.12 = 112$  ← Multiplier More than 1

### Express as a percentage

R

27 per every 50 →  $\frac{27}{50}$  → 54 per every 100 →  $\frac{54}{100}$  → 54%  
 $\frac{13}{30} \rightarrow \frac{13}{30} \times 100 = 43.3333... \rightarrow 43\%$

Can't use equivalence easily to find 'per hundred'

Decimal percentages are still a percentage.

### Simple and compound interest

**Simple Interest**

James invests £2000 at 5% simple interest

$\frac{100\%}{5\%}$   
 $\frac{£2000}{£100}$   
 The original value increases by this amount every year

**Compound Interest**

Tess invests £100 at 10% compound interest for 3 years

£100 → 10% → Y1 £110  
 £110 → 10% → Y2 £121  
 £121 → 10% → Y3 £132.10  
 The multiplier 1.10 repeats each year

### Repeated percentage change

**Compound Interest**

Tess invests £100 at 10% compound interest for 3 years

$£100 \times 1.10 \times 1.10 \times 1.10$   
 Original amount → Repeated multiplier → Number of occurrences

**Depreciation**

Depreciation calculations use multipliers less than 1

Multipliers are commutative — an overall multiplier effect can be calculated by combining the multipliers separately

eg Increase of 10% then a reduction of 10%  
 $\times 1.10 \times 0.9$   
 $\times 0.99$  The multiplier

### Growth and decay

**Compound growth** **Compound decay**

Compound growth and compound decay are exponential graphs

**Decay** — the values get closer to 0  
 The constant multiplier is less than one

**Growth** — the values increase exponentially  
 The constant multiplier is more than one

### Find the original value

Percentage calculations

Original amount  $\times$  Multiplier = Final Value

In a test Lucy scored 60% of her questions correctly. Her score was 24. How many questions were on the test?

Original  $\times 0.6 = 24$   
 $24 \div 0.6 = 40$  marks  
 10% = 6  
 100% = 40  
 Total questions on test

A car sold for a profit of £3000 with a profit of 20%. How much was the car originally?

100% → 20%  
 £3000  
 Original  $\times 1.2 = 3000$   
 $120\% = £3000$   
 $10\% = £250$   
 $100\% = £2500$



# YEAR 10 — PROPORTION...

## Probability

@whisto\_maths

### What do I need to be able to do?

By the end of this unit you should be able to:

- Add, Subtract and multiply fractions
- Find probabilities using likely outcomes
- Use probability that sums to 1
- Estimate probabilities
- Use Venn diagrams and frequency trees
- Use sample space diagrams
- Calculate probability for independent events
- Use tree diagrams

### Keywords

**Event:** one or more outcomes from an experiment

**Outcome:** the result of an experiment

**Intersection:** elements (parts) that are common to both sets

**Union:** the combination of elements in two sets

**Expected Value:** the value/ outcome that a prediction would suggest you will get

**Universal Set:** the set that has all the elements

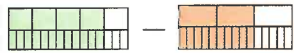
**Systematic:** ordering values or outcomes with a strategy and sequence

**Product:** the answer when two or more values are multiplied together.

### Add, Subtract and multiply fractions

Addition and Subtraction

$$\frac{4}{5} - \frac{2}{3}$$



$$\frac{12}{15} - \frac{10}{15} = \frac{2}{15}$$

Use equivalent fractions to find a common multiple for both denominators

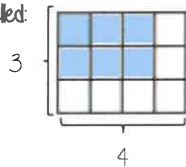
Multiplication

$$\frac{3}{4} \times \frac{2}{3}$$

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

Parts shaded

Modelled:



Total number of parts in the diagram

### Likelihood of a probability

Impossible  
0 or 0%

Even chance  
0.5,  $\frac{1}{2}$  or 50%

Certain  
1 or 100%

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

### Sum to 1

Probability is always a value between 0 and 1

The probability of getting a blue ball is  $\frac{1}{5}$   
∴ The probability of NOT getting a blue ball is  $\frac{4}{5}$

The sum of the probabilities is 1

### Experimental data

Theoretical probability

What we expect to happen

Experimental probability

What actually happens when we try it out

The more trials that are completed the closer experimental probability and theoretical probability become

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

### Sample space

The possible outcomes from rolling a dice

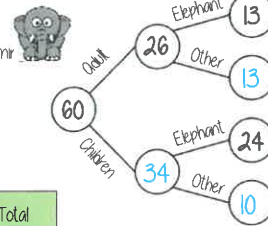
|   | 1  | 2  | 3  | 4  | 5  | 6  |
|---|----|----|----|----|----|----|
| H | 1H | 2H | 3H | 4H | 5H | 6H |
| T | 1T | 2T | 3T | 4T | 5T | 6T |

$$P(\text{Even number and tails}) = \frac{3}{12}$$

### Tables, Venn diagrams, Frequency trees

#### Frequency trees

60 people visited the zoo one Saturday morning. 26 of them were adults. 13 of the adult's favourite animal was an elephant. 24 of the children's favourite animal was an elephant.



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

The total columns on two-way tables show the possible denominators

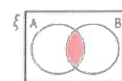
$$P(\text{adult}) = \frac{26}{60}$$

$$P(\text{Child with favourite animal as elephant}) = \frac{13}{37}$$

#### Two-way table

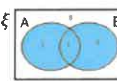
|          | Adult | Child | Total |
|----------|-------|-------|-------|
| Elephant | 13    | 24    | 37    |
| Other    | 13    | 10    | 23    |
| Total    | 26    | 34    | 60    |

#### Venn diagram



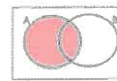
in set A AND set B

$$P(A \cap B)$$



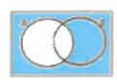
in set A OR set B

$$P(A \cup B)$$



in set A

$$P(A)$$



NOT in set A

$$P(A')$$

### Independent events

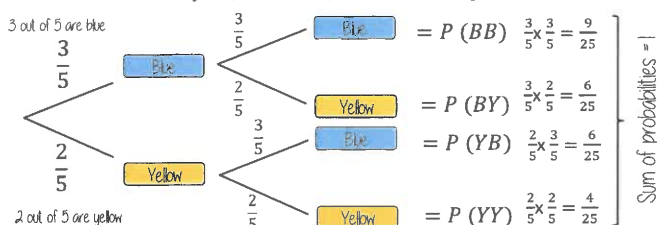
The outcome of two events happening. The outcome of the first event has no bearing on the outcome of the other

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

#### Tree diagram for independent event

Isabel has a bag with 3 blue counters and 2 yellow. She picks a counter and replaces it before the second pick.

Because they are replaced the second pick has the same probability

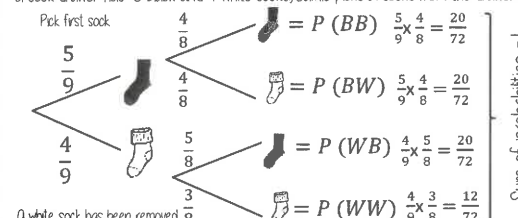


### Dependent events

#### Tree diagram for dependent event

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

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



NOTE: as 'socks' are removed from the drawer the number of items in that drawer is also reduced ∴ the denominator is also reduced for the second pick

# The Guardian

(12 September 2018)



▲ Boris Johnson, Theresa May and Peter Bone reflect at a Brexit supporters' meeting in London. (BBC)

## Jaguar chief warns May: thousands of jobs at risk from your Brexit tactics

**Pippa Crewe**  
Deputy political editor

Britain's biggest car manufacturer, Jaguar Land Rover, has launched a blistering attack on Theresa May's handling of Brexit, as leading Eurosceptics claimed there was "nothing to fear" about leaving the EU without a deal.

Ralf Speth, the company's chief executive, told the prime minister that if a deal failed to reach an agreement with

Brussels "tens of thousands" of jobs in the sector could be lost and its factories faced grinding to a halt.

In a surprise intervention at a landmark car industry summit organised by the government, Speth described the prospect of a cliff-edge break with the EU as "horrifying", warning that if "wrong decisions" were taken now it could result in the "suicide of nations" for the UK.

He stressed the company was committed to the UK but said a hard Brexit would cost it £1.2bn a year, wiping out

profits. "What decisions will we be forced to make, if Brexit means not merely that costs go up, but that we cannot physically build cars on time and on budget in the UK?"

The comments follow similar warnings from other industry chiefs, including those of Airbus and BAE, about the potentially damaging consequences of Britain's decision to leave the EU. May, who was waiting backstage as Speth delivered his speech, did not mention Brexit in her address to the Birmingham summit.

Downing Street said that one of the key elements of the Chequers plan was to try to protect the industry's supply chains with the EU, with the government's proposal helping ensure frictionless trade. The issue came up at a round table later.

Speth told the conference friction at the border could put production in jeopardy at a cost of £10m a day. He also warned that traffic jams on the approach to Dover meant that "honestly we will not be able to build cars".

In an interview passage, he pointed out it was now cheaper for the company to make cars in Slovakia than in Britain.

"Six months from Brexit and uncertainty means that many companies are being forced to make decisions about their businesses that will not be reversed, whatever the outcome, just to survive," he added.

May is holding a cabinet meeting tomorrow where ministers will discuss their plans in the event of the government failing to reach a deal with Brussels. No 10 leaders, however, are growing

## Dairy food may protect the heart, study finds

**Sarah Bowley**  
Health editor

Dairy products such as cheese and milk may protect against heart disease and strokes despite their saturated fats, according to a study. The research suggests a moderate amount - three servings a day - can protect the heart rather than damage it.

The study was carried out mostly in low and middle income countries, where less dairy is consumed, but the lead researcher said he believed the findings held good for those in wealthier countries who avoid dairy, thinking it benefits their health.

Dr Mahabadi Dehghan from McMaster University, in Ontario, Canada, said: "We encourage people who have very low dairy consumption to increase their consumption, especially in low and middle income countries but also in very high income countries."

Concern over dairy stems from the recognition that



## Orbán v the EU Rightwing Hungarian PM defiant over sanction threat

World Page 18 →



# The Guardian

(12th September 2018)

## Component 1: Exploring the Media

**Focus areas:**  
**Media language**  
**Representation**  
**Media contexts**

### PRODUCT CONTEXT

- *The Guardian* is a British national daily newspaper with an average daily circulation of roughly 134,000 copies of their print edition in the UK. (April 2019)
- *The Guardian* newspaper targets a well-educated, relatively young and liberal audience. The demographic is 89% ABC1. Fifty-two percent of *Guardian* readers are male, and the average reader age is 44.
- *The Guardian* has a UK online edition which has over 42.6 million readers (as of October 2014).
- In 2006, *The Guardian* went through a complete redesign. It became smaller, had a new typeface and balanced the longer pieces of journalism out with many shorter stories. The reasons for this were twofold: to adapt to what was going on in the market (*The Independent* and *The Times* had already changed to a tabloid format) and to adapt to people's reading habits, with people now having little time to spare and increasingly 'reading on the go'.

## PART 1: STARTING POINTS – Media language

### Political context

On 23rd June 2016, citizens of the UK voted to leave the European Union (EU). This was nicknamed 'Brexit'. The vote was very close with 51.9% voting leave and 48.1% voting remain. This reflects the divisive nature of the referendum. The campaigns before the referendum were quite aggressive. The leave camp was accused of fuelling racism and xenophobia (fear of strangers), and the remain camp was accused of 'betraying Britain'. Boris Johnson and the other politicians featured in the photo were very fervent Leave campaigners. One of their catchphrases was to label the economic

concerns of the remain party 'Project Fear' while they called theirs 'Project Prosperity'.

The economy was a key element in both campaigns. After the financial crash of 2008, the state of the national and global economy became a popular concern. In terms of Brexit, numerous business leaders backed one side or the other. Popular entrepreneurs like James Dyson supported leaving the EU and insisted it would be good for UK businesses, especially smaller companies. This appeals to 'populist nationalists' who believe the EU takes control from the 'common man'. Alan Sugar (host of *The Apprentice*) insisted Brexit would be terrible for the UK economy, because without the trade deals, big businesses would move abroad. Britain's plan to leave the EU, and especially to limit migration, found support from other EU nations unhappy with their position. One such country is Hungary, whose prime minister, Viktor Orbán, has directly challenged the EU about migration issues. Along with other infringements of other EU laws about freedom of speech and democracy, this has led to direct conflict between Orbán and the EU.

### Cultural context

A reliable topic to attract especially middle class (ABC1) audience is health. This demographic has disposable income to spend on healthier food, gym memberships etc. Many newspapers aimed at this audience, both left and right wing, feature stories about the latest scientific studies and reports about how to live longer, healthier lives. Often these stories are noteworthy because they contradict or complicate a popular health belief e.g. that too much dairy is bad for our health.

### Consider how media language creates and communicates meaning:

- Unlike many of its counterparts that use block, capitalised text for their mastheads, *The Guardian's* **masthead** is written all in lowercase and uses a curved font. This uniqueness makes the newspaper stand out from the crowd when competing for sales on the news-stands and, arguably, is a more personal **mode of address**, one that offers an alternative form of journalism

to the rest of the industry. It also suggests sophistication, which links to *The Guardian's* brand identity of strong investigative journalism.

- The **choice** of stories is serious and complex, suitable for a well-educated target audience.
- The **dominant image** is of a group of politicians looking sad and frustrated. Usually these politicians, particularly Boris Johnson, appear extremely confident and optimistic, so to see them looking so despondent is a striking image.
- The photograph is **anchored with the caption**, explaining they are at a meeting with Brexit supporters. The fact they look so despairing and tired implies that even they have doubts how positive Brexit will be for the UK. This would agree with the left wing, anti-Brexit beliefs of *The Guardian's* target audience.
- Behind them is a sign that reads "From Project Fear to Project Prosperity". The optimistic tone of this slogan is **ironic** when **juxtaposed** with the defeated, sad posture of the politicians.
- The **emotive language** used in the **main headline** further **anchors** the meaning of the photo: words like 'warn' and 'risk' suggest that Brexit is not going to lead to 'prosperity' as the Leave party promised. Again, this reinforces the left wing political beliefs of the target audience.
- The audience is positioned in such a way so as to worry about the effects of Brexit on the UK economy, but to also take pleasure from the defeated postures of the pro-Leave politicians in the photo. This reinforces their personal and collective identity as it tells them they were correct to vote Remain.

### Consider how choice of elements of media language portrays aspects of reality and conveys messages and values:

- Alongside the main article, there is a **linked article** about Orbán in conflict with the EU. Though it doesn't mention the economy, the labelling of Orbán of 'right-wing' immediately tells the liberal target audience of *The Guardian* that this man is a political enemy and reinforces their support for the EU.
- The photo **anchors** the image here, showing Orbán with a belligerent facial expression which suggests he is an aggressive, uncooperative figure.
- There is a **cover line** (or **puff box**) at the top right, for an article in the paper further exploring economic issues, and **graphic** of a dipping line that has become **symbolic** of the financial crash.

- There is a headline for the health story that dairy foods might be good for the heart. This fulfils the news value of unexpectedness as the dominant medical advice has been to eat less dairy.

### Consider the codes and conventions of media language:

- A much smaller part of the front page is given over to the **G2 supplement**, a **regular segment** in the paper which, because of its placing, when displayed on news-stands may well be the section people see first. This supplement offers a lighter alternative to the hard hitting news stories of the rest of the newspaper.
- There is also a **cover line** (or **puff box**) announcing a guide to fitness in the **G2 supplement**. The 'How to...' phrasing makes a healthy lifestyle seem achievable, even when the "for the rest of your life" seems **hyperbolic**. The cartoon of the woman running indicates that this might be a more light-hearted article, and helps to balance the serious tone of the rest of the cover.

### Possible areas for further investigation:

- **Code and conventions** of newspaper covers – layout, use of cover photographs/ images, house style, mastheads.
- **Narrative** – headlines used to tease people to want to read certain stories (could be linked to Roland Barthes – enigma codes).
- **Active/Passive audience**. Historically, readers of print newspapers were considered to be passive (i.e. they read what was in front of them and believed it), especially as there is an expectation that what is shared in the news genre is true. However, today's audiences are much more active and can interact with the news they read. They have the option to read it online, comment and discuss below an article, as well as sharing it on social media. The comments section in newspapers are known as 'below the line' commentary. *The Guardian Online* has a renowned 'below the line' section called *Comment Is Free* that reflects the liberal readers' strong belief in freedom of speech. In 2008, the editor said the future of the press lay in "newspapers becoming *views-papers*" i.e. forums for discussion and opinion.



## PART 2: STARTING POINTS – Representation

### Political context

*The Guardian* is described as having mainstream left political values. It does not have an affiliation with any political party, but does lean towards the left and has a very liberal tradition. It is therefore not surprising that the main photo seems to be mocking well-known and outspoken right wing politicians.

*The Guardian* isn't owned by a group of shareholders like most other newspapers, for whom making a profit is imperative. Therefore they believe that they can hold true to their core journalistic principles.

The paper supported the Remain campaign in the run-up to the Brexit referendum, and has continued to be very critical of the negotiations for Britain to leave the EU.

### Consider the representation of politicians, and Brexit as an issue:

- The **text** of the headline is carefully constructed to position the audience into accepting the newspaper's **viewpoint, analysis and opinion**. Though it doesn't explicitly state an opinion in the style of tabloids (e.g. 'The Sun Says...'), the choice of these main cover stories portray Brexit as dangerous for the economy, and perhaps the cause of future financial crash.
- In both the photograph and the article, politicians are portrayed as ridiculous and clueless. Those in the photo look defeated, in contrast to their slogan on the wall behind them, and the tone of the headline suggests that May, the Prime

Minister, doesn't know what she's doing.

- The **omission** of any positive stories about Brexit and the economy reinforces the target audience's beliefs on this issue.
- The article about Orbán's conflict with the EU and his combative facial expression suggests the EU is a positive organisation and that the UK is foolish to leave.

### Consider the functions and uses of stereotypes:

- Politicians are often portrayed as inept and useless in both left/right wing press, and in both tabloids and broadsheets. By exposing their weaknesses and mocking their decisions, this portrayal of the most powerful people in the country could offer audiences a sense of superiority. Politicians pretend to be intelligent and well-meaning but by **satirising** them, newspapers bring them down to the level of the general public.

### Possible areas for further investigation:

- **Theoretical perspectives** (e.g. Stuart Hall) – representation, stereotype, selection/omission and perhaps how, in some ways, this newspaper front page is reinforcing the **populist ideology** that the political 'elite' are inept and out of touch with reality.
- It would be helpful to **compare this article** with another from the tabloid right-wing press, such as *The Sun*, which portrays politicians similarly but which support Brexit.

| 1. Rhythm                                                                                                    |                                                                                                                            |
|--------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| Writing music down so players can easily read the pitch and duration of the notes they are supposed to play. |                                                                                                                            |
| 1                                                                                                            |  Crotchet = 1 Beat                      |
| 2                                                                                                            |  Quaver = 1/2 Beat                      |
| 3                                                                                                            |  Minim = 2 Beats                        |
| 4                                                                                                            |  Semibreve = 4 Beats                    |
| 5                                                                                                            |  Rest = Rest for 1 beat (Crotchet rest) |
| 6                                                                                                            |  Rest = Rest 1/2 beat (Quaver rest)     |

| 2. Staves |                                                                                                                                                                                                                                                                                                                                                                                                                    |
|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1         |  <p>Staff/ Staff = The <b>Staff</b> is the five lines which the notes are written on. Between these five lines there are four spaces. There are two <b>Staves</b> (known as The Grand <b>Staff</b>) one above the other. They are sometimes also referred to as the <b>Staff</b>, depending on where you are in the world!</p> |
| 4         |  <p>Treble Clef = A symbol that is placed on every line of <b>music</b> to show the notes which will be sung or played by voices and instruments that can achieve higher notes.</p>                                                                                                                                           |
| 5         |  <p>Bass Clef = Signifies low to medium pitches being read on the staff.</p>                                                                                                                                                                                                                                                  |

| 3. DR SMITH |                         | In music we use DR SMITH to help us remember terms of music.                        |                                                                                                                                                                                                                                                      |
|-------------|-------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1           | <b>D</b> ynamics        |                                                                                     | How loud or quiet you play the music.                                                                                                                                                                                                                |
| 2           | <b>R</b> hythm          |                                                                                     | Is a pattern on sounds of different lengths and what makes music move and flow.                                                                                                                                                                      |
| 3           | <b>S</b> tructure       |                                                                                     | Gives shape and balance to music.                                                                                                                                                                                                                    |
| 4           | <b>M</b> elody          |                                                                                     | The main tune of the piece.                                                                                                                                                                                                                          |
| 5           | <b>I</b> nstrumentation |  | A combination of instruments used to perform a piece of music. <ul style="list-style-type: none"> <li>- Strings (bowed)</li> <li>- Woodwind</li> <li>- Brass</li> <li>- Percussion</li> <li>- Keyboard</li> <li>- Guitar</li> <li>- Voice</li> </ul> |
| 6           | <b>T</b> exture         |                                                                                     | Layers of sound in a piece of music.                                                                                                                                                                                                                 |
| 7           | <b>T</b> empo           |                                                                                     | How fast or slow the music is.                                                                                                                                                                                                                       |
| 8           | <b>T</b> onality        |                                                                                     | Major or minor scale.                                                                                                                                                                                                                                |
| 9           | <b>H</b> armony         |                                                                                     | A multiple of pitches being played at the same time.                                                                                                                                                                                                 |

<https://www.youtube.com/watch?v=bHTstUefUq0>  
Practise your rhythms with this link.

| 3. Dynamics    |                   | Dynamics can make the listener feel different emotions. In music you would use Italian words to describe the dynamics. |                                                                                |
|----------------|-------------------|------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
| 1              | <i>pp</i>         | Pianissimo = Very soft & very quiet                                                                                    |                                                                                |
| 2              | <i>p</i>          | Piano = Soft & Quiet                                                                                                   |                                                                                |
| 3              | <i>mp</i>         | Mezzo Piano = Medium soft & quiet                                                                                      |                                                                                |
| 4              | <i>mf</i>         | Mezzo Forte = Medium loud                                                                                              |                                                                                |
| 5              | <i>f</i>          | Forte = Loud                                                                                                           |                                                                                |
| 6              | <i>ff</i>         | Fortissimo – Very loud                                                                                                 |                                                                                |
| Key Vocabulary |                   |                                                                                                                        |                                                                                |
| 1              | Pulse             |                                                                                                                        | he heartbeat of the rhythm/music that you hear.                                |
| 2              | Composition       |                                                                                                                        | An original piece or work of music.                                            |
| 3              | Unison            |                                                                                                                        | Two or more people play or sing the same pitch or in octaves at the same time. |
| 4              | Polyrhythm        |                                                                                                                        | When two or more rhythms with different pulses are heard together.             |
| 5              | Graphic score     |                                     | Representation of music through the use of visual symbols.                     |
| 6              | Call and Response |                                                                                                                        | The leader sings a line (the call) and is answered by a chorus (the response). |
| 7              | Solo              |                                                                                                                        | An individual performance.                                                     |



## Où j'habite

J'habite ...

Ma famille et moi habitons ...

On habite ...

dans une ville historique/touristique

dans un petit village

au bord de la mer

au centre-ville

à la campagne/montagne

en ville

en Angleterre/Écosse/Irlande (du Nord)/

Afrique

au Maroc/pays de Galles

aux Antilles

à Paris/Birmingham

dans le nord-est du/de la/de l'/des ...

le nord/le nord-est

l'est/le sud-est

le sud/le sud-ouest

l'ouest/le nord-ouest

Dans ma région, il y a ...

des vignobles/stations de ski

des collines/forêts

des fermes/champs

un port de pêche

un lac

C'est super parce qu'en hiver/en été,

on peut (faire du ski/de l'escalade).

## Le temps

Il fait beau/mauvais.

Il fait chaud/froid.

Il y a du soleil.

Il y a du brouillard/du vent.

Il y a un orage.

Il pleut/neige/gèle.

Ici, le climat est humide/sec.

Il peut faire très chaud/froid/doux.

Il ne fait pas trop chaud/froid ...

au printemps

en été/automne/hiver

## Les transports

Je vais/peux aller au collège ...

à pied/vélo

en train/métro/car/

voiture/bus

Les transports en commun sont bons.

## En ville

Il y a ...

un château

un centre de loisirs

un marché

un musée

## Where I live

I live ...

My family and I live ...

We live ...

in an historic/touristy town

in a small village

at the seaside

in the town centre

in the countryside/mountains

in town

in England/Scotland/(Northern)

Ireland/Africa

in Morocco/Wales

in the West Indies

in Paris/Birmingham

in the north-east of ...

north/north-east

east/south-east

south/south-west

west/north-west

In my region there is/are

vineyards/ski resorts

hills/forests

farms/fields

a fishing port

a lake

It's great because in winter/summer,

you can (go skiing/climbing).

## Weather

The weather's good/bad.

It's hot/cold.

It's sunny.

It's foggy/windy.

There's a storm.

It's raining/snowing/icy.

Here, the climate is wet/dry.

It can be very hot/cold/mild.

It's not too hot/cold ...

in spring

in summer/autumn/winter

## Transport

I go/can go to school ...

on foot/by bike

by train/underground/coach/

car/bus

The public transport is good.

## In town

There is/are ...

a castle

a leisure centre

a market

a museum

un parc/jardin public  
 un stade  
 un supermarché  
 un théâtre  
 une bibliothèque  
 une cathédrale  
 une église  
 une gare (SNCF)  
 une mairie  
 une mosquée  
 une pharmacie  
 une poste (un bureau de poste)  
 des hôtels  
 beaucoup de magasins

Il n'y a pas de ...  
 Est-ce qu'il y a un/une/des ... près d'ici/  
 par ici?

Va/Allez tout droit.

Tourne/Tournez à droite/gauche.

Prends/Prenez la première/deuxième  
 rue à droite/gauche.

Continue/Continuez jusqu'au carrefour/  
 jusqu'aux feux.

Traverse/Traversez la place/le pont.

Descends/Descendez la rue.

C'est ...

(assez) loin/tout près  
 sur ta/votre droite/gauche  
 au coin  
 en face (du/de la/de l'/des)  
 à côté (du/de la/de l'/des)

a park  
 a stadium  
 a supermarket  
 a theatre  
 a library  
 a cathedral  
 a church  
 a (train) station  
 a town hall  
 a mosque  
 a chemist  
 a post office  
 hotels  
 lots of shops

There isn't a/aren't any ...

Is/Are there a/some ... near here/  
 round here?

Go straight on.

Turn right/left.

Take the first/second road on the  
 right/left.

Continue as far as the crossroads/  
 traffic lights.

Cross the square/bridge.

Go down the road.

It's ...

(quite) a long way/very close  
 on your right/left  
 on the corner  
 opposite  
 next to

## Ma région

Ma région/Une région que je connais  
 bien, c'est ...

C'est dans le (nord/sud) de ...  
 près de la Manche/la frontière  
 allemande/espagnole

J'y habite depuis .../J'y vais ...

Le paysage/La côte est vraiment  
 magnifique/impressionnant(e).

On peut y faire/visiter/voir ...

La région est connue pour ...

Une personne célèbre qui est née en ...,  
 c'est ...

## My region

My region/A region that I know well  
 is ...

It's in the (north/south) of ...  
 near the English Channel/  
 the German/Spanish border

I have lived there since .../I have  
 been going there ...

The landscape/coast is really  
 wonderful/impressive.

You can do/visit/see ... there.

The region is known for ...

A famous person who was born  
 in ... is ...

## Ville de rêve ou ville de cauchemar?

J'habite à...

C'est un petit village/une grande  
 ville dans ...

J'habite dans la banlieue/un quartier de ...

Ce qui me plaît ici, c'est qu'il y a ...

En été/hiver, on peut ...

Le problème, c'est que/qu' ...

## Dream town or nightmare town?

I live in ...

It's a small village/big town in ...

I live in the suburbs/a district of ...

What I like is that ...

In summer/winter, you can ...

The problem is that ...



il n'y a pas assez de (magasins/  
espaces verts)  
il n'y a plus de (cinéma)  
il n'y a ni (parc) ni (aire de jeux)  
il n'y a aucun (bowling)  
il n'y a aucune (zone piétonne)  
il n'y a qu'un seul (magasin)  
il n'y a qu'une seule (rue)  
il n'y a rien pour les jeunes  
il n'y a pas grand-chose à faire

Il y a ...

beaucoup de monde/de voitures  
trop de circulation/de gens  
tellement de bruit/de gens au  
chômage  
peu de travail/de transports en  
commun/commerces  
toujours des déchets par terre  
plusieurs boîtes de nuit/café/ restaurants

Le bowling a fermé.

C'est sale/(trop) tranquille/très animé.

Ce n'est jamais tranquille.

Je trouve ça triste/déprimant/affreux/  
nul/désagréable.

En général, je (ne) suis (pas) content(e)  
de mon village/quartier/ma ville.

there is/are not enough ... (shops/  
green spaces)  
there is/are no longer (a cinema)  
there is neither (a park) nor (a playground)  
there isn't a (single) (bowling alley)  
there isn't a (single) (pedestrian area)  
there is only one (shop)  
there is just one (street)  
there is nothing for young people  
there's not a lot to do

There is/are ...

lots of people/cars  
too much traffic/too many people  
so much noise/so many people out  
of work  
not much work/public transport/  
not many businesses  
always litter on the ground  
several nightclubs/café/ restaurants

The bowling alley has closed down.

It's dirty/(too) quiet/very lively.

It's never quiet.

I find that sad/depressing/awful/  
rubbish/unpleasant.

In general, I am (not) happy with  
my village/district/town.

### Quel temps fera-t-il?

Il y aura ...

du vent  
du soleil  
du tonnerre  
de la grêle  
de la pluie  
des averses  
des éclairs  
des éclaircies

Il fera ...

beau/chaud/froid/frais

Le temps sera ...

brumeux/ensoleillé  
nuageux/orageux  
variable

Le ciel sera bleu/gris/couvert.

Les températures seront en baisse/  
en hausse.

### What will the weather be like?

There will be ...

wind  
sun  
thunder  
hail  
rain  
showers  
lightning  
sunny intervals

It will be ...

fine/hot/cold/cool

The weather will be ...

misty/sunny  
cloudy/stormy  
changeable

The sky will be blue/grey/overcast.

The temperatures will be going down/  
going up.

### En pleine action!

J'ai/Nous avons ...

collecté de l'argent  
vendu nos vieux jeux et jouets  
lavé des voitures  
acheté (de la peinture)  
planté des arbres

### Taking action

I/We have ...

collected money  
sold our old games and toys  
washed cars  
bought (paint)  
planted trees

lancé une pétition en ligne  
 obtenu presque 2 000 signatures  
 écrit un article dans le journal local  
 Le week-end prochain, nous irons  
 là-bas pour ...  
 ramasser les déchets  
 nettoyer la salle  
 repeindre les murs  
 La semaine prochaine, on finira  
 d'installer/de construire ...  
 un passage piéton  
 un panneau  
 une aire de jeux

*launched a petition online  
 obtained nearly 2,000 signatures  
 written an article in the local newspaper  
 Next weekend, we will go there to ...  
 pick up litter  
 clean the room  
 repaint the walls  
 Next week, we will finish installing/  
 building ...  
 a pedestrian crossing  
 a sign  
 a playground*

### **Les mots essentiels**

ailleurs  
 ne ... aucun(e)(s)  
 ne ... jamais  
 ne ... ni ... ni ...  
 ne ... personne  
 ne ... plus  
 ne ... que  
 ne ... rien  
 non plus  
 alors  
 donc  
 de plus  
 en plus  
 également  
 d'ailleurs  
 par contre  
 malheureusement  
 enfin  
 plein de  
 tellement  
 le lendemain  
 selon  
 plusieurs  
 quelques  
 trop (de)  
 peu (de)  
 assez (de)  
 tellement (de)

### **High-frequency words**

*elsewhere  
 not any, not a single  
 never  
 neither ... nor ...  
 nobody, not anyone  
 no longer, no more  
 only  
 nothing  
 nor/either  
 so, therefore  
 so, therefore  
 what's more, moreover  
 also  
 equally, also  
 moreover, besides  
 on the other hand  
 unfortunately  
 finally  
 lots of  
 really/so  
 the next day  
 according to  
 several  
 some  
 too much/many  
 little/not much  
 enough  
 so much/many*





# AQA German 90 Word Writing Mat



## Score 5 ingredients...

- ✓ **ALL** bullet points of task covered
- ✓ At least 2 opinions with a reason
- ✓ Past tense used
- ✓ Present tense used
- ✓ Future tense used
- ✓ Change the person
- ✓ Connective used
- ✓ Adjective used
- ✓ DIFFERENT adjective to last used
- ✓ Adverb used
- ✓ Intensifier used
- ✓ Interesting vocabulary used



## Intensifiers...

Es war... = it was.....  
sehr = very  
nicht sehr = not very  
ziemlich = quite

nicht so = not so  
zu = too  
ein bißchen = a little  
wirklich = really  
etwas = somewhat  
ganz = completely/somewhat

## Idioms...

um den heißen Brei herumreden – to beat around the bush  
du kannst Gift drauf nehmen – you can bet your life on that  
eine Extrawurst verlangen – to ask of special treatment  
zwei Fliegen mit einer Klappe schlagen – to kill 2 birds with 1 stone  
sich zum Affen machen – to make a fool of oneself  
da stöppt der Bär – it will be a good party  
Tomaten auf den Augen – to be oblivious of what's going on  
den Nagel auf den Nagel treffen – to hit the nail on the head  
ich verstehe nur Bahnhof – it's all Greek to me

## Conditional...

Ich möchte  
Es wäre  
Wir könnten  
Wir sollten

I would like  
It would be  
We could..  
We should

## Opinions

Ich würde sagen = I would say  
wenn Sie mich fragen = if you ask me  
meiner Meinung nach = in my opinion  
auf der einen Seite = on the one hand  
auf der anderen Seite = on the other hand  
wie gesagt = as I said  
Ich denke, dass – I think that  
Ich finde, dass – I find that  
Ich meine, dass – I think that

Ich liebe (I love)  
Ich schwärme für (I absolutely love)  
Am liebsten mag ich (I like... best)  
Ich mag (I like)  
(Sth) gefällt mir (It suits me)  
Ich (verb) gern (I like)  
Ich (verb) lieber (I prefer)  
Ich hasse (I hate)  
Ich interessiere mich für (I'm interested in)  
Es ist mir egal (It's all the same to me)

alt (old)  
altmodisch (old-fashioned)  
fashioned  
anstrengend (tiring)  
aufrichtig (sincere)  
einfach (easy)  
faul (lazy)  
fleißig (hard-working)  
gesprächig (talkative)  
glücklich (happy)  
groß (tall)  
gut (good)  
häßlich (ugly)

heiß (hot)  
höflich (polite)  
interessant (interesting)  
kalt (cold)  
klein (short – height)  
kurz (short)  
lang (long)  
langweilig (boring)  
laut (noisy)  
liebenswert (kind)  
lustig (funny)  
modern (modern)  
mutig (brave)

neu (new)  
ruhig (quiet)  
sauber (clean)  
schlecht (bad)  
schmutzig (dirty)  
schön (nice)  
schüchtern (shy)  
schwierig (difficult)  
traurig (sad)  
unangenehm  
(unpleasant)  
wichtig (important)



## MARKSCHEME / 16

### Response / 6

- ☐ Variety of appropriate vocab (is it relevant?)
- ☐ Complexity
- ☐ Three time frames
- ☐ Clear message
- ☐ Does it fit the task?

### Content / 10

- ☐ Cover ALL aspects of the task!
- ☐ Opinions
- ☐ A lot of information

## Linking words...

**NO word order change**

denn = because  
aber = but  
und = and  
oder = or  
jedoch = however  
also = therefore

trotzdem = in spite of that  
kurz gesagt = in short  
nur = only  
außerdem = moreover  
deswegen = because of that  
daß = that  
weil = because  
obwohl = although  
wenn = when/if (pres/fut)  
als = when/as (past)  
bevor = before



**Boot words kick the verb to the end of the sentence**

## Comparatives...

(adjective)er + als (more + adj + than)  
**Irregulars!**  
gut > besser  
alt > älter  
so + (adjective) + wie (as + adj + as)  
jung > jünger groß > größer  
hoch > höher



## Adjective Endings...

|     | Mask        | Fem         | Neut        | Plur        |
|-----|-------------|-------------|-------------|-------------|
| Nom | DER kleine  | DIE kleine  | DAS kleine  | DIE kleinen |
| Akk | DEN kleinen | DIE kleine  | DAS kleine  | DIE kleinen |
| Dat | DEM kleinen | DER kleinen | DEM kleinen | DEN kleinen |
| Gen | DES kleinen | DER kleinen | DES kleinen | DER kleinen |

|     | Mask        | Fem         | Neut        | Plur  |
|-----|-------------|-------------|-------------|-------|
| Nom | EIN guter   | EINE gute   | EIN gutes   | gute  |
| Akk | EINEN guten | EINE gute   | EIN gutes   | gute  |
| Dat | EINEM guten | EINER guten | EINEM guten | guten |
| Gen | EINES guten | EINER guten | EINES guten | guten |



Don't forget to refer to **THREE** time frames...

## Present

### Time phrases...

jetzt (now)  
sofort (right now)  
heute (today)  
heutzutage (nowadays)  
am Morgen / morgens (in the morning)  
am Nachmittag / nachmittags (usually)  
(in the afternoon)  
am Abend / abends (in the evening)  
jeden Tag (every day)  
jede Woche (every week)  
einmal in der Woche (once a week)  
fünfmal im Monat (five times a month)  
jeden Monat (every month)  
so bald wie möglich  
immer (always)  
normalerweise (usually)  
oft (often)  
ab und zu (from time to time)  
manchmal (sometimes)  
fast nie (hardly ever)  
nie / niemals (never)  
bald (soon)  
früh (early)

### TMP TIME, MANNER, PLACE

#### PRESENT (I do)

##### WOHNEN ARBEITEN

ich wohne-E arbeit-E  
du wohnst-ST arbeit-EST  
er/sie/es wohnt-T arbeit-ET  
wir wohnen-EN arbeiten-EN  
ihr wohnt-T arbeitet-T  
sie wohnen-EN arbeiten-EN

##### VERBS WITH VOWEL CHANGE

##### SPRECHEN NEHMEN ESSEN

spreche nehme esse  
sprichst nimmst isst  
spricht nimmt isst  
sprechen nehmen essen  
spricht nehmt esst  
sprechen nehmen essen

These verbs are always followed by an infinitive. The infinitive will always be at the end of the sentence:

**MÖGEN KÖNNEN DÜRFEN**

ich mag kann darf  
du magst kannst darfst  
er/sie/es mag kann darf  
wir mögen können dürfen  
ihr mögt könnt dürft  
sie mögen können dürfen  
**MÜSSEN WOLLEN SOLL**  
(must) (want) (should)  
ich muss will soll  
du musst willst sollst  
er/sie/es muss will soll  
wir müssen wollen sollen  
ihr müsst wollt sollt  
sie müssen wollen sollen

## Past

### Time phrases...

gestern (yesterday)  
vorgestern (the day before yesterday)  
gestern Vormittag (yesterday morning)  
gestern Nachmittag (yesterday afternoon)  
gestern Abend (yesterday evening)  
letzte Woche (last week)  
letzten Monat (last month)  
letztes Jahr (last year)  
letzten Montag (last Monday)  
vor einer Woche (a week ago)  
vor einem Monat (a month ago)  
vor einem Jahr (a year ago)  
vor (before)  
heute Morgen (this morning)  
heute Nachmittag (this afternoon)  
heute Abend (tonight)  
diese Woche (this week)  
dieses Jahr (this year)  
1999 (in 1999)

#### Perfect Tense

(I did / I have done)

##### HABEN

ich habe  
du hast  
er/sie/es hat  
wir haben  
ihr habt  
sie haben

##### SEIN

bin  
bist  
ist  
sind  
seid  
sind

Auxiliary Verbs – sein used with verbs of movement/change of state

##### + PAST PARTICIPLE TO THE END OF THE SENTENCE

e.g. Ich habe Pommes gegessen  
Ich bin nach Berlin gefahren

##### COMMON VERBS THAT USE SEIN

gehen > gegangen  
bleiben > geblieben  
kommen > gekommen  
laufen > gelaufen  
fahren > gefahren  
sterben > gestorben  
schwimmen > geschwommen  
ankommen > angekommen  
fliegen > geflogen  
abfahren > abgefahren  
sein > gewesen  
umziehen > umgezogen

#### Imperfect Tense

Take off the –en from an infinitive and add these endings:

Ich spielte – I played  
Du spieltest – You played  
Er/sie/es spielte – He/she/it/one played  
Wir spielten – We played  
Ihr spieltet – You (pl) played  
Sie/sie spielten – They/You (formal) played  
Haben / Sein (had/was)  
ich hatte  
du hattest  
er/sie/es hatte  
wir hatten  
ihr hattet  
sie hatten  
war  
warst  
er/sie/es war  
waren  
wart  
waren  
Es war – it was  
Es hat mir gefallen – I liked it

### Score 5 Checklist:

- ✓ ALL bullet points of task covered
- ✓ At least 2 opinions with a reason
- ✓ Past tense used
- ✓ Present tense used
- ✓ Future tense used
- ✓ Change the person
- ✓ Connective used
- ✓ Adjective used
- ✓ DIFFERENT adjective to last used
- ✓ Adverb used
- ✓ Intensifier used
- ✓ Interesting vocabulary used

## Future

### Time phrases...

morgen (tomorrow)  
übermorgen (the day after tomorrow)  
morgen Vormittag (tomorrow morning)  
morgen Nachmittag (tomorrow afternoon)  
morgen Abend (tomorrow evening)  
nächste Woche (next week)  
nächsten Monat (next month)  
nächstes Jahr (next year)  
nächsten Montag (next Monday)  
in einer Woche (in a week's time)  
in einem Monat (in a month's time)  
in einem Jahr (in a year's time)  
in Zukunft (in the future)  
nach (after)

#### FUTURE

##### Ich werde

##### Du wirst

##### Er/Sie/Es wird

##### Wir werden

##### Ihr werdet

##### Sie/Sie werden

#### FUTURE TENSE

##### + INFINITIVE TO THE END OF THE SENTENCE

e.g. Ich werde Fußball spielen.

Du wirst nach Berlin fahren.

es wird Spaß machen – it will be fun

es wird gut sein – it will be good

es wird mir gefallen – I will like it

#### Don't forget #V2

(verb always in 2<sup>nd</sup> idea)

##### COMMON INFINITIVES

gehen – to go  
sehen – to see  
fahren – to go/travel  
denken – to think  
spielen – to play  
benutzen – to use  
tanzen – to dance  
essen – to eat  
nehmen – to take  
sprechen – to speak  
reden – to chat  
trinken – to drink  
schwimmen – to swim  
bleiben – to stay  
kommen – to come  
sterben – to die  
laufen – to run  
fliegen – to fly  
versuchen – to try  
probieren – to try  
verdienen – to earn  
ausgeben – to spend  
kaufen – to buy  
haben – to have  
sein – to be  
sammeln – to collect  
wandern – to hike  
abfahren – to depart  
anrufen – to call  
annehmen – to accept  
zunehmen – to gain weight  
umsteigen – to change

##### SEPARABLE VERBS

aufstehen – to get up  
aufwachen – to wake up  
anziehen – to get dressed  
umziehen – to get changed  
teilnehmen – to take part  
mitspielen – to play with  
aufräumen – to tidy up  
abwaschen – to wash up  
fernsehen – to watch TV  
ankommen – to arrive  
abfahren – to depart  
anrufen – to call  
annehmen – to accept  
zunehmen – to gain weight  
umsteigen – to change

#### Points to note:

- content
- quality
- needs detail
- opinions
- complexity
- time frames.





## G Poder and querer

Page 208

**Poder** (to be able to / 'can') and **querer** (to want) are stem-changing verbs usually followed by the infinitive.

|                |            |                 |              |
|----------------|------------|-----------------|--------------|
| <b>puedo</b>   | I can      | <b>quiero</b>   | I want       |
| <b>puedes</b>  | you can    | <b>quieres</b>  | you want     |
| <b>puede</b>   | he/she can | <b>quiere</b>   | he/she wants |
| <b>podemos</b> | we can     | <b>queremos</b> | we want      |
| <b>podéis</b>  | you can    | <b>queréis</b>  | you want     |
| <b>pueden</b>  | they can   | <b>quieren</b>  | they want    |

## G soler + infinitive

Page 208

To say what you usually do or tend to do, you can use **soler** + **infinitive**.

**Suelo salir** con amigos.  
I usually / I tend to go out with friends.

**Soler** is a stem-changing verb.

|                       |                |
|-----------------------|----------------|
| (yo)                  | <b>suelo</b>   |
| (tú)                  | <b>sueles</b>  |
| (él/ella/usted)       | <b>suele</b>   |
| (nosotros/as)         | <b>solemos</b> |
| (vosotros/as)         | <b>soléis</b>  |
| (ellos/ellas/ustedes) | <b>suelen</b>  |

## G The perfect tense

Page 219

This is used to talk about what you **have** done.

Use the present tense of the verb **haber** + **past participle**.

|                       |               |
|-----------------------|---------------|
| (yo)                  | <b>he</b>     |
| (tú)                  | <b>has</b>    |
| (él/ella/usted)       | <b>ha</b>     |
| (nosotros/as)         | <b>hemos</b>  |
| (vosotros/as)         | <b>habéis</b> |
| (ellos/ellas/ustedes) | <b>han</b>    |

To form the past participle, remove the

**-ar, -er** or **-ir** from the infinitive and add:

**-ado** (-ar verbs)

**-ido** (-er/-ir verbs)

Some past participles are irregular:

|                             |                  |
|-----------------------------|------------------|
| <b>escribir</b> (to write)  | → <b>escrito</b> |
| <b>poner</b> (to put)       | → <b>puesto</b>  |
| <b>hacer</b> (to do / make) | → <b>hecho</b>   |
| <b>romper</b> (to break)    | → <b>roto</b>    |
| <b>morir</b> (to die)       | → <b>muerto</b>  |
| <b>ver</b> (to see / watch) | → <b>visto</b>   |

## G Para + infinitive

Use **para** to mean 'in order to...' or 'for -ing'. It is followed by the **infinitive**.

Uso YouTube **para pasar** el tiempo.

I use YouTube **in order to pass** the time.

Es una aplicación muy buena **para descargar** música.

It is a very good app **for downloading** music.

|                       | <b>levantarse</b><br>(to get up) | <b>divertirse</b><br>(to enjoy oneself) | <b>llevarse con</b><br>(to get on with) |
|-----------------------|----------------------------------|-----------------------------------------|-----------------------------------------|
| (yo)                  | <b>me levanto</b>                | <b>me divierto</b>                      | <b>me llevo</b>                         |
| (tú)                  | <b>te levantas</b>               | <b>te diviertes</b>                     | <b>te llevas</b>                        |
| (él/ella/usted)       | <b>se levanta</b>                | <b>se divierte</b>                      | <b>se lleva</b>                         |
| (nosotros/as)         | <b>nos levantamos</b>            | <b>nos divertimos</b>                   | <b>nos llevamos</b>                     |
| (vosotros/as)         | <b>os levantáis</b>              | <b>os divertís</b>                      | <b>os lleváis</b>                       |
| (ellos/ellas/ustedes) | <b>se levantan</b>               | <b>se divierten</b>                     | <b>se llevan</b>                        |

# Español – Y10

## Term 4

# Mi rutina cotidiana

| TIME/ FREQUENCY                                                                                                                                                                                                                                    | VERB                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | EXTRA-<br>INFORMATION                                                                                                           | IN... / WITH...                                                                                                                                                                                                                                                                                                                                                                                     | TIME                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>por la mañana (in the morning)</p> <p>normalmente (normally)</p> <p>siempre (always)</p> <p>a menudo (often)</p> <p>a veces (at times)</p> <p>de vez en cuando (from time to time)</p> <p>casi nunca (almost never)</p> <p>apenas (hardly)</p>  | <p>me despierto (I wake up)</p> <p>me levanto (I get up)</p> <p>me preparo el desayuno (I make myself breakfast)</p> <p>desayuno (I have breakfast)</p> <p>me visto (I get dressed)</p> <p>me pongo el uniforme escolar (I put my uniform on)</p> <p>me ducho (I shower)</p> <p>me cepillo los dientes (I brush my teeth)</p> <p>me maquillo (I put on my makeup)</p> <p>me peino (I do my hair)</p> <p>salgo de la casa (I leave the house)</p> <p>voy al colegio (I go to school)</p> | <p>temprano (early)</p> <p>tarde (late)</p> <p>rápidamente</p> <p>(quickly)</p> <p>a pie (by foot)</p> <p>en coche (by car)</p> | <p>en... (in)</p> <p>el salón (the lounge)</p> <p>el comedor (the dining room)</p> <p>la cocina (the kitchen)</p> <p>el baño (the bathroom)</p> <p>mi dormitorio (in my room)</p> <p>el despacho (the study)</p> <p>en el jardín (in the garden)</p> <p>con... (with)</p> <p>mi hermano (my brother)</p> <p>mi hermana (my sister)</p> <p>mis padres (my parents)</p> <p>mi familia (my family)</p> | <p>a las... (at)</p> <p>siete (7)</p> <p>ocho (8)</p> <p>nueve (9)</p> <p>diez (10)</p> <p>once (11)</p> <p>tres (3)</p> <p>cuatro (4)</p> <p>cinco (5)</p> <p>seis (6)</p> <p>siete (7)</p> <p>ocho (8)</p> <p>nueve (9)</p> <p>y diez (10 past)</p> <p>y cuarto (quarter past)</p> <p>y media (half past)</p> <p>menos cuarto (quarter to)</p> <p>menos diez (ten to)</p> <p>en punto (on the dot)</p> |
|                                                                                                                                                                                                                                                    | <p>suelo (I usually)</p> <p>intento (I try)</p> <p>evito (I avoid)</p> <p>me gusta (I like)</p> <p>antes de (before)</p> <p>después de (after)</p> <p>tengo que (I have to)</p>                                                                                                                                                                                                                                                                                                         |                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                                                                                                                                                                                                    | <p>vuelvo a casa (I return home)</p> <p>regreso a casa (I return home)</p> <p>me relajo (I relax)</p> <p>ceno (I have supper)</p> <p>veo la tele (I watch TV)</p> <p>me acuesto (I go to bed)</p>                                                                                                                                                                                                                                                                                       |                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                                                                                                                                                                                                                    | <p>suelo (I usually)</p> <p>intento (I try)</p> <p>evito (I avoid)</p> <p>me gusta (I like)</p> <p>antes de (before)</p> <p>después de (after)</p> <p>tengo que (I have to)</p>                                                                                                                                                                                                                                                                                                         |                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                          |
| <p>por la tarde (in the afternoon)</p> <p>normalmente (normally)</p> <p>siempre (always)</p> <p>a menudo (often)</p> <p>a veces (at times)</p> <p>de vez en cuando (from time to time)</p> <p>casi nunca (almost never)</p> <p>apenas (hardly)</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                          |



# LA TELE Y EL CINE



TV/film



Pros and cons of cinema



Role models

| TV/film                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Pros and cons of cinema                                                                                                                                                                                 |                                                                                                                                                                                                       | Role models                       |                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Suelo ver - I tend to watch</p> <p>Me encantan - I love</p> <p>Me molan - I like</p> <p>Me chiflan - I'm crazy about</p> <p>Prefiero - I prefer</p>                                                                                       | <p>los concursos - gameshows</p> <p>los programas de deportes - sports programmes</p> <p>los documentales - documentaries</p> <p>las series policiaca - crime series</p> <p>los realitys - reality TV shows</p> <p>los culebrones/las telenovelas - soaps</p> <p>las comedias - a comedys</p> <p>el telediarrio/las noticias - the news</p> <p>los dibujo animados - cartoons</p> <p>el meteo - the weather</p> <p>los misterios - mysteries</p> <p>las películas de amor - love films</p> <p>las películas de terror - horror films</p> <p>las películas de acción - action films</p> <p>las películas de aventuras - adventure films</p> <p>las películas de animación - animated films</p> <p>las películas de ciencia - ficción - sci-fi films</p> <p>las películas de fantasía - fantasy films</p> <p>las películas extranjera - foreign films</p> | <p>divertidos/as - fun</p> <p>entretendidos/as - entertaining</p> <p>informativos/as - informative</p> <p>emocionantes - exciting</p> <p>interesantes - interesting</p> <p>adictivos/as - addictive</p> | <p>porque son - because they are</p>                                                                                                                                                                  | <p>en el cine - at the cinema</p> | <p>hay demasiadas personas - there are too many people</p> <p>las entradas son muy caras - the tickets are very expensive</p> <p>los asientos no son cómodos - the seats are uncomfortable</p> <p>los otros espectadores me molestan - other spectators annoy me</p> <p>si vas al baño te pierdes una parte - if you go to the toilet you miss a part</p> <p>tienes que hacer cola - you have to queue</p> |
|                                                                                                                                                                                                                                              | <p>No aguantó - I can't stand</p> <p>No soporto - I can't stand</p> <p>Odio - I hate</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <p>aburridos/as - boring</p> <p>tontos/a - silly</p> <p>malos/as - bad/rubbish</p> <p>infantiles - childish</p>                                                                                         |                                                                                                                                                                                                       |                                   | <p>se puede hablar de la película - you can talk about the film</p> <p>se puede pausar la película si quieres - you can pause the film if you want</p>                                                                                                                                                                                                                                                     |
| <p>Me gusta ir al cine porque... - I love going to the cinema because...</p>                                                                                                                                                                 | <p>el ambiente es mejor - the atmosphere is better</p> <p>la imagen es mejor en la gran pantalla - the picture is better on the big screen</p> <p>las palomitas están ricas - the popcorn is tasty</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                         |                                                                                                                                                                                                       |                                   |                                                                                                                                                                                                                                                                                                                                                                                                            |
| <p>Prefiero ver pelis en casa porque... - I prefer to watch film at home because...</p>                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                         |                                                                                                                                                                                                       |                                   |                                                                                                                                                                                                                                                                                                                                                                                                            |
| <p>Admiro a... - I admire</p> <p>_____ es un buen modelo a seguir - _____ is a good role model</p> <p>Mi inspiración es... - my inspiration is...</p> <p>Un buen modelo a seguir es alguien que... - a good role model is someone who...</p> | <p>apoya a organizaciones benéficas - supports charities</p> <p>recauda fondos para... - raises money for...</p> <p>tiene mucho talento - has a lot of talent</p> <p>trabaja en defensa de los animales - works in defense of animals</p> <p>usa su fama para ayudar a los demás - uses his/her fame to help others</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <p>la pobreza - poverty</p> <p>la homofobia - homophobia</p> <p>los derechos de la mujer/los refugiados - women's/refugee rights</p>                                                                    | <p>porque - because</p> <p>no - he/she doesn't</p> <p>se comporta mal - behave badly</p> <p>se emborracha - get drunk</p> <p>se mete en problemas con la policia - get in trouble with the police</p> |                                   |                                                                                                                                                                                                                                                                                                                                                                                                            |

|                                                                                                      |                                                                                                                                   |
|------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| <p>Suelo pasar al menos cinco horas enfrente de la tele cada día.</p>                                | <p>I tend to spend at least <u>5</u> hours a day in front of the TV.</p>                                                          |
| <p>Me encantan los realitys porque son emocionantes pero también son adictivos.</p>                  | <p>I love reality shows because they're <u>exciting</u> but they're also <u>addictive</u>.</p>                                    |
| <p>Además me chiflan las comedias</p>                                                                | <p><u>Also</u>, I'm crazy about <u>comedies</u></p>                                                                               |
| <p>sin embargo los que más me gustan son los documentales dado que son informativos y educativos</p> | <p>however what I like the <u>most</u> are <u>documentaries</u> given that they are <u>informative</u> and <u>educational</u></p> |
| <p>y me encanta aprender nuevas cosas.</p>                                                           | <p>and I like to learn new things.</p>                                                                                            |
| <p>A veces voy al cine porque dicen que</p>                                                          | <p>Sometimes I go to the cinema because <u>they say that</u></p>                                                                  |
| <p>la imagen es mejor en la gran pantalla</p>                                                        | <p>the picture is better on the <u>big screen</u></p>                                                                             |
| <p>pero prefiero ver pelis en casa, porque en el cine</p>                                            | <p>but I prefer to watch films at home, because at the cinema</p>                                                                 |
| <p>hay demasiadas personas y los asientos no son cómodos</p>                                         | <p>there are <u>too many people</u> and the seats aren't comfy</p>                                                                |
| <p>y en casa se puede pausar la película si quieres.</p>                                             | <p>and at home you can pause the film if you want.</p>                                                                            |
| <p>Hay muchos actores que me gustan pero mi actriz favorita</p>                                      | <p>There are lots of actors that I like but my favourite actress</p>                                                              |
| <p>es Emma Watson ya que apoya a organizaciones benéficas</p>                                        | <p>is <u>Emma Watson</u> because <u>she</u> supports <u>charities</u></p>                                                         |
| <p>y lucha por los derechos de la mujer.</p>                                                         | <p>and fights for <u>women's rights</u>.</p>                                                                                      |
| <p>Es un buen modelo a seguir.</p>                                                                   | <p>She's a good role model.</p>                                                                                                   |

A model text on TV preferences

## Adjectives

MUCHOS RIESGOS.  
LOT OF RISKS.

11



## GCSE Physical Education – Types of Training

**Continuous training** - Involves a steady but regular pace at a moderate intensity (aerobic) which should last for at least 20 minutes. i.e. running, walking, swimming, rowing or cycling.  
Used by a **marathon runner**.



| Advantages                                                                                                                     | Disadvantages                                                                             |
|--------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Ideal for beginners</li> <li>• Highly effective for long distance athletes</li> </ul> | <ul style="list-style-type: none"> <li>• Can be extremely boring as repetitive</li> </ul> |

### Fartlek training – Referred to as ‘speed play’

This is a form interval training but without rest. Involves a variety of changing intensities over different distances and terrains.

i.e. **1 lap at 50% max, 1 lap walking, 1 lap at 80% (aerobic and anaerobic used)**

Used by **games players – Hockey players**



| Advantages                                                                                                                                                                                                                                       | Disadvantages                                                                                                                                                                                                    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• More enjoyable than interval and continuous training</li> <li>• Good for sports which require changes in speed</li> <li>• Easily adapted to suit the individuals level of fitness and sport.</li> </ul> | <ul style="list-style-type: none"> <li>• Performer must be well motivated particularly when intensity is high</li> <li>• Difficult to assess whether performer is performing at the correct intensity</li> </ul> |

**Weight/Resistance training** – A form of training that uses progressive resistance against a muscle group. Used by **cyclists**.

Muscular strength: **High weight x low repetitions**

Muscular endurance: **Low weight x high repetitions**



| Advantages                                                                                                                                                                                                                 | Disadvantages                                                                                                                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Variety of equipment to prevent boredom</li> <li>• Strengthens the whole body or the muscle groups targeted.</li> <li>• Can be adapted easily to suit different sports</li> </ul> | <ul style="list-style-type: none"> <li>• Requires expensive equipment</li> <li>• If exercises are not completed with the correct technique it can cause injury to the performer</li> </ul> |

### HIIT Training

These are High Intensity Interval Training activities where speed and recovery are used throughout the session. Exertion levels are high (7/10) for between 30 secs and 3 mins. Work output is much shorter than recovery time  
Examples might be Body pump, High Impact Aerobics, Spinning.



**Interval training** - Involves periods of work followed by periods of rest. i.e. **Sprint for 20 metre + walk back to start.**  
Used by a **200m sprinter**



| Advantages                                                                                                                                                   | Disadvantages                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Quick and easy to set up.</li> <li>• Can mix aerobic and anaerobic exercise which replicates team games.</li> </ul> | <ul style="list-style-type: none"> <li>• It can be hard to keep going when you start to fatigue (high motivation and self discipline needed)</li> <li>• Over training can occur if sufficient rest is not allowed between sessions (48 hours)</li> </ul> |

### Plyometrics training

Involves high-impact exercises that develop power. i.e. **bounding/hopping, squat jumps.** Used by **long jumpers, 100 m sprinters or basketball players.**



| Advantages                                                                                                                                          | Disadvantages                                                                                                                                               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Easy to set up requiring little or no equipment</li> <li>• Hugely effective in developing power</li> </ul> | <ul style="list-style-type: none"> <li>• Can result in injury if not fully warmed up.</li> <li>• Can place a great stress on joints and muscles.</li> </ul> |

**Circuit training** - A series of exercises completed one after another. Each exercise is called a station. Each station should work a different area of the body to avoid fatigue.  
i.e. **press ups, sit ups, squats, shuttle runs.**



| Advantages                                                                                                                                                                                                                         | Disadvantages                                                                                                                                                                                                          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Quick and easy to set up</li> <li>• Easy to complete with large groups</li> <li>• Can be adjusted to be made specific for certain sports. i.e. <b>netball specific circuit</b></li> </ul> | <ul style="list-style-type: none"> <li>• Technique can be affected by fatigue and can increase risk of injury</li> <li>• Must have motivation and drive to complete the set amount of repetitions and sets.</li> </ul> |

| Advantages                                                                                                                                                             | Disadvantages                                                                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>• Variety avoids boredom</li> <li>• Instructor will challenge &amp; motivate</li> <li>• Great way to meet new people</li> </ul> | <ul style="list-style-type: none"> <li>• Gym membership can be expensive.</li> <li>• Group classes are not tailored to individual needs.</li> </ul> |

[illegible]

Definition/notes/concept

**Keywords:**



# GCSE Physical Education – Principles of Training

Principles of training - Guidelines that ensure training is **effective** and results in **positive adaptations**. These principles are used when planning an Exercise Programmes

## FITT Principle

|           |                                 |                                                                             |
|-----------|---------------------------------|-----------------------------------------------------------------------------|
| Frequency | How often training takes place. | Increase training from once a week to two                                   |
| Intensity | How hard the exercise is.       | Increase resistance from 10kg to 15kg or increase incline on the treadmill. |
| Time      | The length of the session.      | Increase training session from 45 minutes to 55 minutes.                    |
| Type      | The method of training used.    | Change to from interval training to Fartlek training.                       |

## Progression

Using overload in a progressive way over the course of a programme. Once adaptations have happened overload needs to be applied to make gains again, e.g. lifting more in week 12 than in week 2 of the programme.



## Overload

Working the body harder than normal/gradually increasing the amount of exercise you do. i.e. bench press 50kg x 10 repetitions and increase to 55kg x5 repetitions.

## Reversibility

If training is not regular, adaptations will be reversed. This can happen when:

- Suffering from illness and cannot train
- Injury
- After an off-season.



## Specificity

Training showed be **matched** to the requirements of the sport or position the performer is involved in.

Training must be specifically designed to develop the right:

- Muscles
- Type of fitness
- Skills



## Individual needs

All athletes programmes would differ depending on:

- Performer's goals/targets
- Strength and weaknesses
- Age/gender
- Current health/fitness levels



## Overtraining

Occurs when you **train too hard** and do not allow the body enough **rest/recovery time**. Signs/symptoms include: extended muscle soreness, frequent illness & increase injuries.

## Calculating Training Zones/Thresholds of Training

**Maximum Heart Rate (MHR) =**  
**220 – age**

**Aerobic target zone: 60–80% of MHR**  
**(60% = x 0.6 / 80% = x 0.8)**

**Anaerobic target zone: > 85% MHR**  
**(85% = x 0.85)**

>85%  
80%  
60%

Anaerobic training target zone  
(Training for power and speed)

Aerobic training target zone (Training  
for cardiovascular fitness and muscular  
endurance)

[illegible]

Definition/notes/concept

**Keywords:**



# GCSE Dance Knowledge Organiser – Infracore

|                                                                                                                                                                                                                 |                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                   |                                                                              |                                                                                                                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| <p><b>Stimulus</b><br/>Life beneath the surface of a city. Human interactions. "Under the brown fog of a winter dawn. / A crowd flowed over London Bridge, so many" T.S. Eliot. The Wasteland 7/7 bombings.</p> | <p><b>Aural Setting</b><br/>String instruments, electronic sounds and everyday sounds such as train whistles as train whistles</p>                                           | <p><b>Dance Style</b><br/>Contemporary Ballet<br/>Wayne McGregor</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <p><b>Costume</b><br/>Fitted shorts, vests, t-shirts in flesh, black, grey. One female dancer wears a wrap-around skirt. One male dancer wears long trousers.</p> | <p><b>Performance Environment</b><br/>Proscenium arch/theatrical setting</p> | <p><b>Lighting</b><br/>White, green, orange, blue, dark intensity throughout, side lights, 6 white rectangles.</p> |
| <p><b>Themes</b><br/>Relationships, seeing below the surface, human interactions</p>                                                                                                                            | <p><b>Dancers</b><br/>12<br/>6 male<br/>6 female</p>                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                   |                                                                              |                                                                                                                    |
| <p><b>Choreographic Intention</b><br/>Seeing below the surface</p>                                                                                                                                              | <p><b>Choreographic Approach</b><br/>SHOW<br/>MAKE<br/>TASK</p>                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                   |                                                                              |                                                                                                                    |
| <p><b>Types of relationships</b></p>                                                                                                                                                                            | <p>Choreographer worked collaboratively with the dancers. Sections then put together to create sentences, paragraphs and finally pieced together with the accompaniment.</p> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                   |                                                                              |                                                                                                                    |
| <p><b>Pedestrian language</b></p>                                                                                                                                                                               |                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                   |                                                                              |                                                                                                                    |
| <p><b>Open for interpretation</b></p>                                                                                                                                                                           | <p><b>Set</b><br/>Black stage and floor<br/>18M LED screen showing animated figures walking across</p>                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                   |                                                                              |                                                                                                                    |
|                                                                                                                                                                                                                 |                                                                                                                                                                              | <p><b>Costume Contributions</b><br/><b>Stimulus</b> – Life beneath a city – monochrome colours used to reflect the dark and depressing nature of those living below the poverty line in a city.<br/><b>Intention</b> – Seeing below the surface – top of the body is covered and bottom exposed is many of the costumes, giving a sense of focus on the legs of the dancers, which could reference 'below' or the 'bottom'.<br/><b>Mood</b> – Dull, monochrome colours create a dark and serious mood.<br/>Complements other components – The use of monochrome coloured costumes complement the use of white lighting.<br/><b>Sculpts body</b> – The tight fitting costumes and bare legs sculpt the lines of the dancers' bodies.<br/><b>Uniformity</b> – The use of black shorts for most of the dancers creates a sense of uniformity<br/><b>Gender</b> – one male dancers wears trousers but no top to highlight his masculinity and male gender</p> |                                                                                                                                                                   |                                                                              |                                                                                                                    |
|                                                                                                                                                                                                                 |                                                                                                                                                                              | <p><b>Aural Setting Contributions</b><br/><b>Stimulus</b> – The use of everyday sound such as a train whistle highlights the stimulus of 'life below the surface of a city' as this is a typical everyday sound you would hear when living or working in a city.<br/><b>Intention</b> – The use of sound effects such as the sound of a train passing highlights the intention of 'life below the surface' as it sounds the sound is similar to if you were stood under a rail bridge listening to trains passing over.<br/><b>Mood</b> – the use of string instruments creates a sombre and sad mood.<br/><b>Complements other components</b> – the use of classical strong instruments complements the classical ballet style of the piece<br/><b>Structure</b> – the aural setting works with the lighting to support each section of the work, informing the audience of the structure of the piece.</p>                                              |                                                                                                                                                                   |                                                                              |                                                                                                                    |
|                                                                                                                                                                                                                 |                                                                                                                                                                              | <p><b>Lighting Contributions</b><br/><b>Stimulus</b> – Beneath the surface – lights light the floor only suggesting 'below' or 'low'<br/><b>Intention</b> – Human interactions – lighting used to light the duets dancing and no other space, so that whole focus is on the interactions between the dancers<br/><b>Mood</b> – Intense – use of dark lighting creates an intense mood<br/><b>Complements other components</b> – use of white lights to light dancer's bodies complement the monochrome costumes.<br/><b>Sculpts bodies</b> – white light sculpts the bodies of the dancers<br/><b>Highlights dancer</b> – dancers are specifically lit to highlight them amongst a black stage<br/><b>Highlights dance space</b> – white rectangles dictate dance space.</p>                                                                                                                                                                              |                                                                                                                                                                   |                                                                              |                                                                                                                    |
|                                                                                                                                                                                                                 |                                                                                                                                                                              | <p><b>Set Contributions</b><br/><b>Stimulus</b> – Life beneath the surface – dancers literally performing below the surface of the LED screen.<br/><b>Intention</b> – Human interactions – lack of set underneath the screen enhances the focus on the dancers and their interactions with one another<br/><b>Mood</b> – darkness with light only focusing on dancers' bodies creates a serious mood<br/><b>Complements other components</b> – black set and white lights on the LED screen complement the monochrome costumes<br/><b>Geographical context</b> – the LED screen has animations of everyday people walking across, suggesting a city location.<br/><b>Context</b> – as they are underneath the screen, the location could be dwellers who live in basements or homeless people who live under bridges.</p>                                                                                                                                 |                                                                                                                                                                   |                                                                              |                                                                                                                    |



# GCSE PHOTOGRAPHY

Develop ideas through investigations informed by contextual and other sources, demonstrating analytical and cultural understanding.



Plenty of photos and/c shoots. Successful work is likely to be cohesive (ie: similar, related, planned, etc.) and genuinely influenced by the work of other photographers, artists, designers, or craftspeople.

AO1

Refine ideas through experimenting and selecting appropriate resources, media, materials, techniques and processes.



Choose the right tools resources. Demonstrate technical skills using your camera, the darkroom or Photoshop. Show you can manage and experiment with materials and techniques well. Use your skills to improve your work.

AO2

| AO1<br>Contextual understanding                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | AO2<br>Experimenting and refining                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | AO3<br>Reflective recording                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | AO4<br>Personal presentation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Developing your ideas                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Creative making                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Observation and evaluation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Final outcomes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <p>Make mindmaps, collect inspiring images on moodboards.</p> <p>Research lots of relevant photographers.</p> <p>Make comparisons between your images and the work of other photographers.</p> <p>Analyse photographs using KITE. Make this a creative presentation.</p> <p>Prepare photoshop plans, showing ideas and intentions, with thumbnail sketches, eg: as storyboards.</p> <p>Take plenty of photos and/or photo shoots. Successful work is likely to be cohesive (ie: similar, related, planned, etc.) and genuinely influenced by the work of other photographers, artists, designers, or craftspeople.</p> <p>Explain your ideas regularly.</p> | <p>Choose a range of tools, resources and techniques. Explore and experiment with them.</p> <p>Show technical skill using your camera, the darkroom or Photoshop. Demonstrate you can manage and experiment with materials and techniques well.</p> <p>Show 2-3 alternative edits for each image. Present all images you make or edit (do not delete!)</p> <p>Use your skills to improve and refine your work. Show the stages of your editing, not just the final result. Revisit images to improve and refine them further.</p> | <p>Draw sketches for photo shoot ideas and plans.</p> <p>Take lots of photographs for each shoot. Present all photographs taken (do not delete any)! Show technical skill using your camera. Experiment with camera techniques.</p> <p>Annotate your work. Use WWW and EBI for a page of work rather than individual images.</p> <p>Draw (or trace) composition diagrams.</p> <p>Compare and contrast different versions of your own photos, as well as with the work of others.</p> <p>Evaluate your work and suggest next steps to improve your pictures or project.</p> <p>Create a rating system for your work, eg: a yellow sticker beside your favourite edits.</p> | <p>Your project should start and finish, with linked stages in between.</p> <p>Extend your rating system with red stickers for your best pictures from each photo shoot.</p> <p>Make a small group of 'best-of' photos for each photo shoot after editing.</p> <p>Complete your project with a set of images that are related to previous edits and the photographers you have looked at.</p> <p>Make prints, use mixed media or assemble 3D objects.</p> <p>Your finals should have a similar theme or subject matter, and use similar techniques.</p> |

## Photography Assessment Objectives

Record ideas, observations and insights relevant to your intention in visual and/or other forms, demonstrating an ability to reflect on their work in progress.



AO3

Take photographs. Make mindmaps, collect images, annotate your work. Compare and contrast different versions of your photos, as well as with the work of others. Evaluate your work and suggest next steps to improve your project.

Present a personal, informed and meaningful response demonstrating analytical and critical understanding, realising intentions and - where appropriate, making connections between visual, written, oral or other elements.

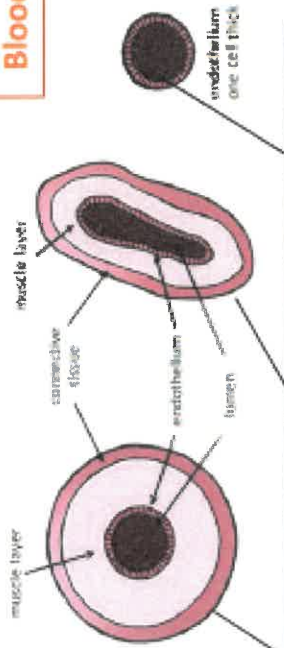
AO4

Complete your project, with a set of prints that are related to previous work (ie: they don't just suddenly appear!). Make prints that have a similar theme or use similar techniques.



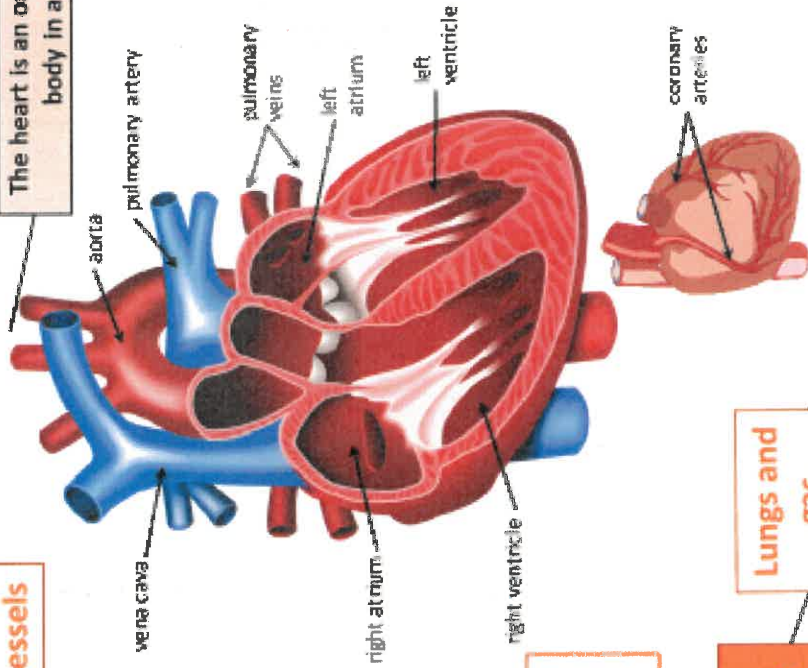


## Blood vessels



| Artery                                                                                                                        | Vein                                                                                                                                                                | Capillary                                                               |
|-------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| Carry blood away from the heart                                                                                               | Carry blood to the heart                                                                                                                                            | Connects arteries and veins                                             |
| Thick muscular walls, small lumen, carry blood under high pressure, carry oxygenated blood (except for the pulmonary artery). | Thin walls, large lumen, carry blood under low pressure, have valves to stop flow in the wrong direction, carry deoxygenated blood (except for the pulmonary vein). | One cell thick to allow diffusion, carry blood under very low pressure. |

## Heart



Different structure in the heart have different functions

|                                        |                                                                                                                    |
|----------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| <b>Right ventricle</b>                 | Pumps blood to the lungs where gas exchange takes place.                                                           |
| <b>Left ventricle</b>                  | Pumps blood around the rest of the body.                                                                           |
| <b>Pacemaker (in the right atrium)</b> | Controls the natural resting heart rate. Artificial electrical pacemakers can be fitted to correct irregularities. |
| <b>Coronary arteries</b>               | Carry oxygenated blood to the cardiac muscle.                                                                      |
| <b>Heart valves</b>                    | Prevent blood in the heart from flowing in the wrong direction.                                                    |

The heart is an organ that pumps blood around the body in a double circulatory system

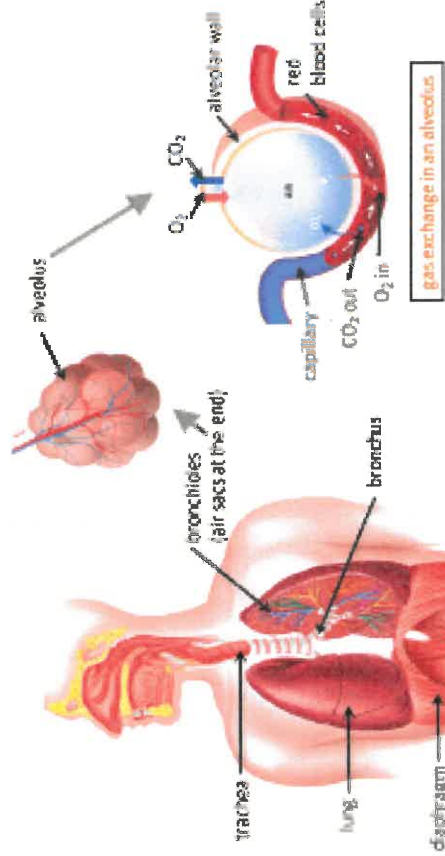
## Blood

Blood is a tissue consisting of plasma, in which blood cells, white blood cells and platelets are suspended

| Plasma (55%)                                     | Red blood cells (45%)                                | White blood cells (<1%)                                        | Platelets (<1%)                    |
|--------------------------------------------------|------------------------------------------------------|----------------------------------------------------------------|------------------------------------|
| Pale yellow fluid                                | Carries oxygen                                       | Part of the immune system                                      | Fragments of cells                 |
| Transports CO <sub>2</sub> , hormones and waste. | Large surface area, no nucleus, full of haemoglobin. | Some produce antibodies, others surround and engulf pathogens. | Clump together to form blood clots |

## Lungs and gas exchange

|                    |                                               |                                                                 |
|--------------------|-----------------------------------------------|-----------------------------------------------------------------|
| <b>Trachea</b>     | Carries air to/from the lungs                 | Rings of cartilage protect the airway.                          |
| <b>Bronchioles</b> | Carries air to/from the air sacs (alveoli)    | Splits into multiple pathways to reach all the air sacs.        |
| <b>Alveoli</b>     | Site of gas exchange in the lungs             | Maximises surface area for efficient gas exchange.              |
| <b>Capillaries</b> | Allows gas exchange between into/out of blood | Oxygen diffuses into the blood and carbon dioxide diffuses out. |



The heart pumps low oxygen/high carbon dioxide blood to the lungs

| Disease                      | Cause                                                                             | Effect                                              | Treatment                                                                                     |
|------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------------------------------------------|
| Coronary heart disease (CHD) | <i>A build up for fatty substances in the coronary arteries (atherosclerosis)</i> | Oxygen-ated blood cannot get to the cardiac muscle. | Stents: inserted into the blocked artery to open it up.<br>Statin: lower harmful cholesterol. |
| Faulty heart valves          | <i>Valves don't open or close properly</i>                                        | Blood can leak or flow in the wrong direction       | Biological valve<br>transplant or a mechanical valve can be inserted                          |

## Cancer

### Non-communicable diseases

The result of changes in DNA that lead to uncontrolled growth and division

|                         |                                                                                     |
|-------------------------|-------------------------------------------------------------------------------------|
| <b>Benign tumour</b>    | Contained in one area of the body (usually by a membrane) — not cancer.             |
| <b>Malignant tumour</b> | Invade tissues and spread to different parts of the body to form secondary tumours. |

Some cancers have genetic risk factors.

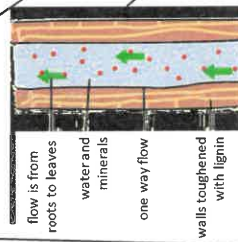
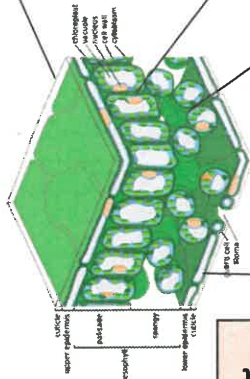
Carcinogens and ionising radiation increase the risk of cancer by changing/ damaging DNA

**Risk factors for heart/lung disease and certain types of cancer include**  
drinking alcohol, diet, obesity and smoking

These risks factors can also affect the brain, liver and the health of unborn babies

## Plant organ systems

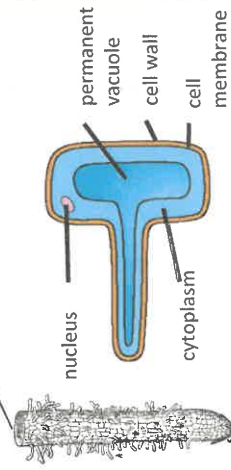
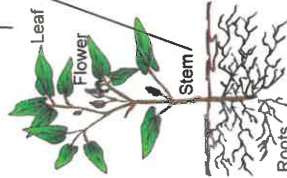
The roots, stem and leaves form a plant organ system for transport of substances around the plant



xylem



phloem

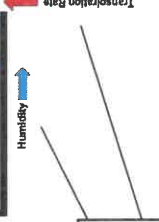
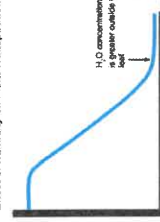


## Plant tissues

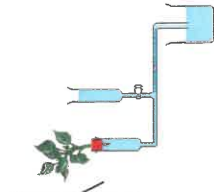
### AQA GCSE ORGANISATION part 3

| Epidermal tissues  | <i>Waxy cuticle (top layer of the leaf)</i>                                                                    | Reduces water loss from the leaf                                                                                                             |
|--------------------|----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Palisade mesophyll | <i>Guard cells and stomata</i>                                                                                 | Guard cells open and close the stomata to control water loss and allow for gas exchange (oxygen and carbon dioxide).                         |
| Spongy mesophyll   | <i>Palisade cells</i>                                                                                          | Cells near the top surface of the leaf that are packed with chloroplasts that contain chlorophyll. Both adaptations maximize photosynthesis. |
| xylem              | <i>Air spaces in the leaf between cells</i>                                                                    | Increased surface area for gas exchange so that carbon dioxide can diffuse into photosynthesising cells.                                     |
| phloem             | <i>Hollow tubes strengthened by lignin adapted for the transportation of water in the transpiration stream</i> | Allows transport of water and mineral ions from the roots to the stem and the leaves.                                                        |
| Meristem tissue    | <i>Cell sap moves from one phloem cell to the next through pores in the end walls</i>                          | Transports dissolved sugars from the leaves to the rest of the plant for immediate use or storage (translocation).                           |
|                    | <i>New cells (roots and shoot tips) are made here including root hair cells</i>                                | Root hair cells have an increased surface area for the uptake of water by osmosis, and mineral ions by active transport.                     |

### Effect of Humidity on Plant Transpiration



The shape of the graph for light intensity is the same for temperature (energy)



A potometer is used to measure the amount of water lost over time (rate of transpiration)

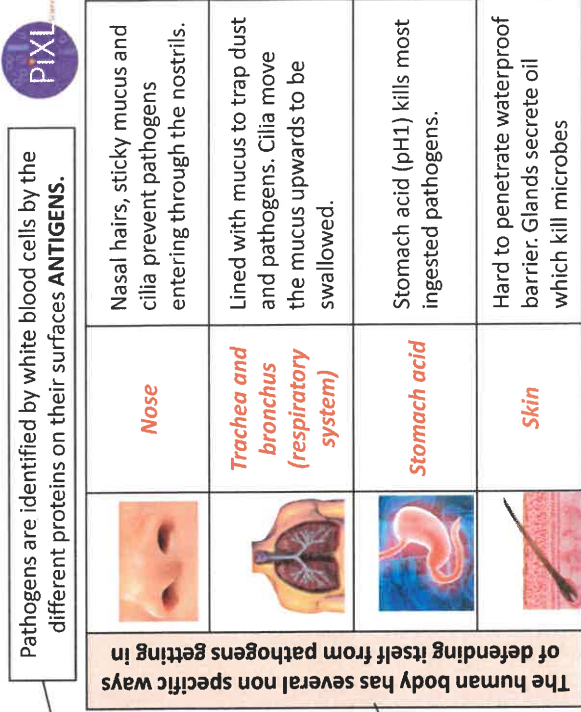
## Transpiration

The rate at which water is lost from the leaves of a plant. The transpiration stream is the column of water moving through the roots, stem and leaves

Temperature, humidity, air movement and light intensity affect the rate of transpiration.

## Transpiration





| Phagocytes  | <b>Phagocytosis</b>         | Phagocytes engulf the pathogens and digest them.                                                                                                                                      |
|-------------|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Lymphocytes | <b>Antibody production</b>  | Specific antibodies destroy the pathogen. This takes time so an infection can occur. If a person is infected again by the same pathogen, the lymphocytes make antibodies much faster. |
|             | <b>Antitoxin production</b> | Antitoxin is a type of antibody produced to counteract the toxins produced by bacteria.                                                                                               |

## AQA GCSE INFECTION AND RESPONSE part 1

**Plants have several ways of defending themselves from pathogens and animals**

| <b>Physical</b>                                   | <b>Mechanical</b>                                |
|---------------------------------------------------|--------------------------------------------------|
| Thick waxy layers, cell walls stop pathogen entry | Thorns, curling up leaves to prevent being eaten |
| <b>Chemical</b>                                   |                                                  |
| Antibacterial and toxins made by plant            |                                                  |

| Detection and identification of plant diseases (bto only) |                                                                                                                      | Identification |
|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|----------------|
| <b>Stunted growth</b>                                     | Reference using gardening manual or website, laboratory test for pathogens, testing kit using monoclonal antibodies. |                |
| <b>Spots on leaves</b>                                    |                                                                                                                      |                |
| <b>Area of decay</b>                                      |                                                                                                                      |                |
| <b>Malformed stem/leaves</b>                              |                                                                                                                      |                |
| <b>Discolouration</b>                                     | Magnesium ions needed to make chlorophyll – not enough leads to chlorosis – leaves turn yellow.                      |                |
| <b>Presence of pests</b>                                  |                                                                                                                      |                |

**Nitrate ions** needed for protein synthesis – lack of nitrate = stunted growth.

Bacteria may produce toxins that damage tissues and make us feel ill

| Viruses                                                  | Bacteria (prokaryotes)                                                                                      | Protists (eukaryotes)                             | Fungi (eukaryotes)                                                                 |
|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|---------------------------------------------------|------------------------------------------------------------------------------------|
| e.g. cold, influenza, measles, HIV, tobacco mosaic virus | e.g. tuberculosis (TB), Salmonella, Gonorrhoea                                                              | e.g. dysentery, sleeping sickness, malaria        | e.g. athlete's foot, thrush, rose black spot                                       |
| DNA or RNA surrounded by a protein coat                  | No membrane bound organelles (no chloroplasts, mitochondria or nucleus). Cell wall. Single celled organisms | Membrane bound organelles. Usually single celled. | Membrane bound organelles, cell wall made of chitin. Single celled or multi-celled |

**Pathogens are microorganisms that cause infectious disease**

**Pathogens**

**Communicable diseases**

Viruses live and reproduce inside cells causing damage

Pathogens may infect plants or animals and can be spread by direct contact, water or air

| Pathogen        | Disease                     | Symptoms                                                     | Method of transmission                                         | Control of spread                                                          |
|-----------------|-----------------------------|--------------------------------------------------------------|----------------------------------------------------------------|----------------------------------------------------------------------------|
| <b>Virus</b>    | <b>Measles</b>              | Fever, red skin rash.                                        | Droplet infection from sneezes and coughs.                     | Vaccination as a child.                                                    |
| <b>Virus</b>    | <b>HIV</b>                  | Initially flu like systems, serious damage to immune system. | Sexual contact and exchange of body fluids.                    | Anti-retroviral drugs and use of condoms.                                  |
| <b>Virus</b>    | <b>Tobacco mosaic virus</b> | Mosaic pattern on leaves.                                    | Enters via wounds in epidermis caused by pests.                | Remove infected leaves and control pests that damage the leaves.           |
| <b>Bacteria</b> | <b>Salmonella</b>           | Fever, cramp, vomiting, diarrhoea.                           | Food prepared in unhygienic conditions or not cooked properly. | Improve food hygiene, wash hands, vaccinate poultry, cook food thoroughly. |
| <b>Bacteria</b> | <b>Gonorrhoea</b>           | Green discharge from penis or vagina.                        | Direct sexual contact or exchange of body fluids.              | Use condoms. Treatment using antibiotics.                                  |
| <b>Protists</b> | <b>Malaria</b>              | Recurrent fever.                                             | By an animal vector (mosquitoes).                              | Prevent breeding of mosquitoes. Use of nets to prevent bites.              |
| <b>Fungus</b>   | <b>Rose black spot</b>      | Purple black spots on leaves.                                | Spores carried via wind or water.                              | Remove infected leaves. Spray with fungicide.                              |

|                                                                                                                              |                               |                                                                                     |                                                          |
|------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------|
| An organism will receive all the energy it needs for living processes as a result of the energy transferred from respiration | <b>For movement</b>           |   | To enable muscles to contract in animals.                |
|                                                                                                                              | <b>For keeping warm</b>       |  | To keep a steady body temperature in a cold environment. |
|                                                                                                                              | <b>For chemical reactions</b> |  | To build larger molecules from smaller one.              |

During long periods of vigorous activity muscles become fatigued and stop contracting efficiently

## Response to exercise

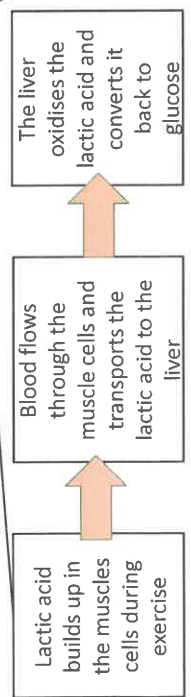
|                                                                             |                                                  |                                                                   |
|-----------------------------------------------------------------------------|--------------------------------------------------|-------------------------------------------------------------------|
| <b>During exercise the human body reacts to increased demand for energy</b> | <b>Heart rate increases</b>                      | Top pump oxygenated blood faster to the muscle tissues and cells. |
|                                                                             | <b>Breathing rate and breath volume increase</b> | This increases the amount of oxygen entering the blood stream.    |

**Metabolism is the sum of all the reactions in a cell or the body**

## Metabolism

|                                                                                                                                            |                                                                                                        |
|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| <b>The energy transferred by respiration in cells is used by the organism for the continual enzyme controlled processes of metabolism.</b> | Conversion of glucose to starch, glycogen and cellulose.                                               |
|                                                                                                                                            | The formation of lipid molecules from a molecule of glycerol and three molecules of fatty acid.        |
|                                                                                                                                            | The use of glucose and nitrate ions to form amino acids which in turn are used to synthesise proteins. |
|                                                                                                                                            | Respiration                                                                                            |
|                                                                                                                                            | Breakdown of excess proteins to form urea for excretion.                                               |

**The extra amount of oxygen required to remove all lactic acids from cells is called the oxygen debt**



## Response to exercise HT only

## Respiration

### AQA GCSE BIOENERGETICS part 2



Cellular respiration is an exothermic reaction which is continuously occurring in all living cells

## Anaerobic respiration

*Respiration when oxygen is in short supply. Occurs during intensive exercise*

During hard exercise, muscle cells are respiring so fast that blood cannot transport enough oxygen to meet their needs.

Glucose is partially oxidised to produce lactic acid which builds up in muscle tissue causing them to become painful and fatigued.



**Anaerobic respiration releases a much smaller amount of energy than aerobic respiration.**

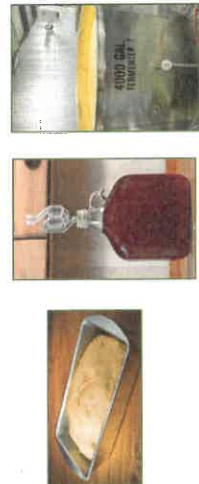
The incomplete oxidation of glucose causes a build up of lactic acid and creates an oxygen debt

## Anaerobic respiration in plant and yeast cells

*The end products are ethanol and carbon dioxide. Anaerobic respiration in yeast cells is called fermentation*



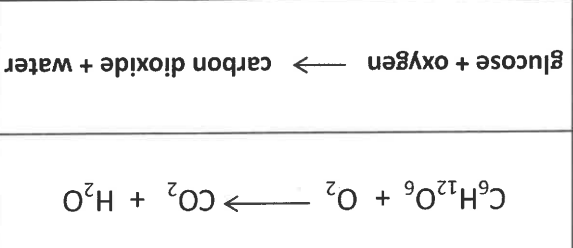
This process is economically important in the manufacture of alcoholic drinks and bread.



## Aerobic respiration

*Respiration with oxygen. Occurs inside the mitochondria continuously*

Glucose is oxidised by oxygen to transfer the energy the organism needs to perform its functions.

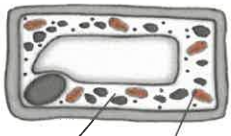


**Aerobic respiration releases a large amount of energy from each glucose molecule**

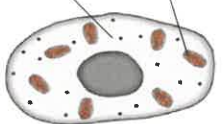
Electron micrograph of a mitochondrion



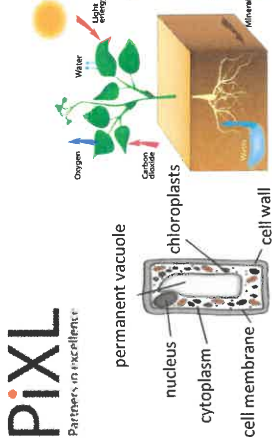
plant cell



animal cell





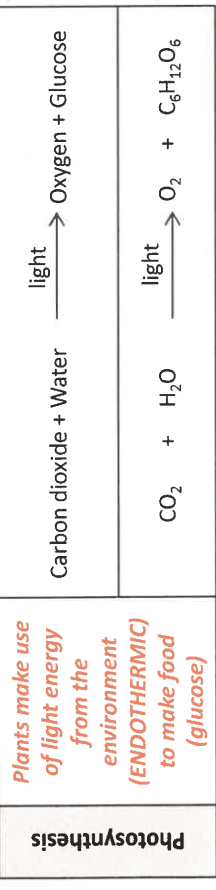


Respiration, stored as insoluble starch, fats or oils for storage, cellulose for cell walls, combine with nitrates from the soil to form amino acids for protein synthesis

**Plants use the glucose produced in photosynthesis in a variety of ways**

**Photosynthetic reaction**

The plant manufactures glucose from carbon dioxide and water using energy transferred from the environment to the chloroplasts by light



**The rate of photosynthesis is affected by temperature, light intensity, carbon dioxide concentration, and the amount of chlorophyll**

| Factors affecting the rate of photosynthesis |                                                                                                                                                                                                                                     |                                                                                                                                                                           |  |  |
|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| Factor                                       | How the rate is affected                                                                                                                                                                                                            | Limiting factors (why the rate stops going up)                                                                                                                            |  |  |
| Temperature                                  | As the temperature of the environment the plant is in increases (up to a point) as there is more energy for the chemical reaction.                                                                                                  | Photosynthesis is an enzyme controlled reaction. If the temperature increases too much, then the enzymes become denatured and the rate of reaction will decrease and stop |  |  |
| Light intensity                              | Light intensity increases as the distance between the plant and the light sources increases. As light intensity increases so does the rate of photosynthesis (up to a point) as more energy is available for the chemical reaction. | At point X another factor is limiting the rate of photosynthesis. This could be carbon dioxide concentration, temperature or the amount of chlorophyll                    |  |  |
| Carbon dioxide concentration                 | Carbon dioxide is needed for plants to make glucose. The rate of photosynthesis will increase when a plant is given higher concentrations of carbon dioxide (up to a point).                                                        | At point X another factor is limiting the rate of photosynthesis. This could be light intensity, temperature or the amount of chlorophyll                                 |  |  |
| Amount of chlorophyll                        | Chlorophyll is a photosynthetic pigment that absorbs light and allows the reaction between water and carbon dioxide to occur (photosynthesis)                                                                                       | Another factor could limit the rate of photosynthesis. This could be light intensity, temperature or the carbon dioxide concentration                                     |  |  |

|                                                                                      |                                                                        |                                                                                                                                       |
|--------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| Control conditions in greenhouses to reduce limiting factors can improve crop yields |                                                                        |                                                                                                                                       |
| Heating                                                                              | Used to provide optimum temperatures for maximum plant growth.         | Growers must balance the economics of additional costs of controlling the conditions to maximise photosynthesis with making a profit. |
| Artificial lighting                                                                  | Enhances the natural sunlight especially overnight and on cloudy days. |                                                                                                                                       |
| Extra carbon dioxide                                                                 | Gas can be pumped into the air inside the greenhouse.                  |                                                                                                                                       |

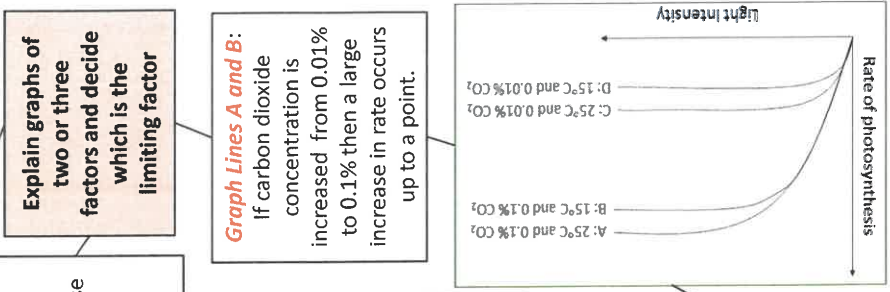
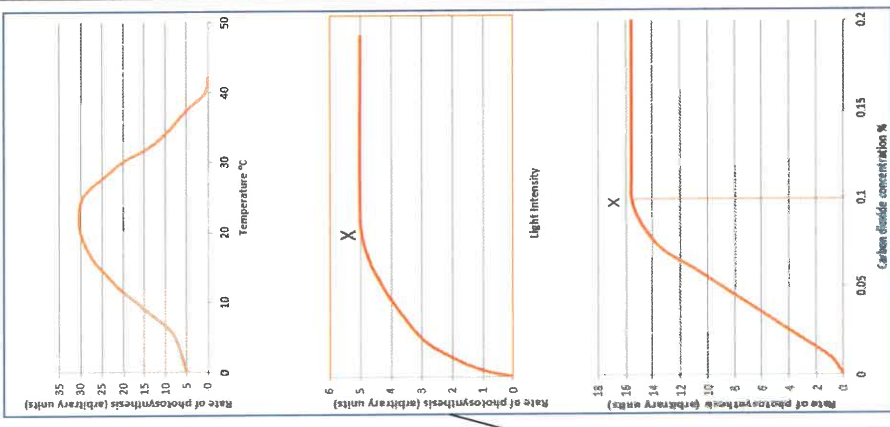


## AQA GCSE BIOENERGETICS part 1

### Rate of photosynthesis

### Rate of photosynthesis HT Only

**Light intensity obeys the inverse square law. This means that if you double the distance between the plant and the light source you quarter the light intensity**



**Graph lines A and B:** If carbon dioxide concentration is increased from 0.01% to 0.1% then a large increase in rate occurs up to a point.

**Graph lines A and C:** If carbon dioxide concentration is increased from 0.01% to 0.1% then a large increase in rate occurs up to a point.

**Oxidation** Is **Loss** (of electrons) **Reduction** Is **Gain** (of electrons)

**HT ONLY:** Reactions between metals and acids are redox reactions as the metal donates electrons to the hydrogen ions. This displaces hydrogen as a gas while the metal ions are left in the solution.

| Ionic half equations (HT only)                                                                                                                                                                                                                                                                                                                                        |                   |           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------|
| For displacement reactions                                                                                                                                                                                                                                                                                                                                            | Acid name         | Salt name |
|                                                                                                                                                                                                                                                                                                                                                                       | Hydrochloric acid | Chloride  |
|                                                                                                                                                                                                                                                                                                                                                                       | Sulfuric acid     | Sulfate   |
|                                                                                                                                                                                                                                                                                                                                                                       | Nitric acid       | Nitrate   |
| The ionic equation for the reaction between iron and copper (II) ions is:<br>$\text{Fe} + \text{Cu}^{2+} \rightarrow \text{Fe}^{2+} + \text{Cu}$<br>For example:<br>The half-equation for iron (II) is:<br>$\text{Fe} \rightarrow \text{Fe}^{2+} + 2\text{e}^-$<br>The half-equation for copper (II) ions is:<br>$\text{Cu}^{2+} + 2\text{e}^- \rightarrow \text{Cu}$ |                   |           |
| <b>Oxidation and reduction in terms of electrons (HT ONLY)</b><br>Oxidation is the loss of electrons.<br>Reduction is the gain of electrons.                                                                                                                                                                                                                          |                   |           |
| <b>Neutralisation of acids and salt production</b><br>acid + alkali → salt + water<br>acid + metal carbonate → salt + water + carbon dioxide                                                                                                                                                                                                                          |                   |           |

sodium hydroxide + hydrochloric acid → sodium chloride + water  
calcium carbonate + sulfuric acid → calcium sulfate + carbon dioxide + water

| Neutralisation                                |                                                                                                                                                      |
|-----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| Acids can be neutralised by alkalis and bases | An alkali is a soluble base e.g. metal hydroxide.<br>A base is a substance that neutralises an acid e.g. a soluble metal hydroxide or a metal oxide. |
| Metals react with oxygen to form metal oxides | magnesium + oxygen → magnesium oxide<br>$2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$                                                            |
| Reduction                                     | This is when oxygen is removed from a compound during a reaction<br>e.g. metal oxides reacting with carbon, extracting low reactivity metals         |
| Oxidation                                     | This is when oxygen is gained by a compound during a reaction<br>e.g. metals reacting with oxygen, rusting of iron                                   |

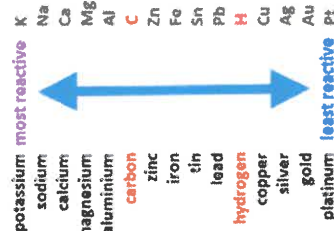
ette

| Reaction with acids                                         | metal + acid → metal salt + hydrogen |
|-------------------------------------------------------------|--------------------------------------|
| Acids react with some metals to produce salts and hydrogen. |                                      |
| Reactions of acids and metals                               |                                      |
| Extraction of metals and reduction                          |                                      |
| Reactions with acid                                         |                                      |
| Reactions with water                                        |                                      |
| Group 1 metals                                              |                                      |
| Group 2 metals                                              |                                      |
| Zinc, iron and copper                                       |                                      |

Unreactive metals, such as gold, are found in the Earth as the metal itself. They can be mined from the ground.

| Reaction with acids                | metal + acid → metal salt + hydrogen |
|------------------------------------|--------------------------------------|
| Extraction of metals and reduction |                                      |
| Reactions with acid                |                                      |
| Reactions with water               |                                      |
| Group 1 metals                     |                                      |
| Group 2 metals                     |                                      |
| Zinc, iron and copper              |                                      |

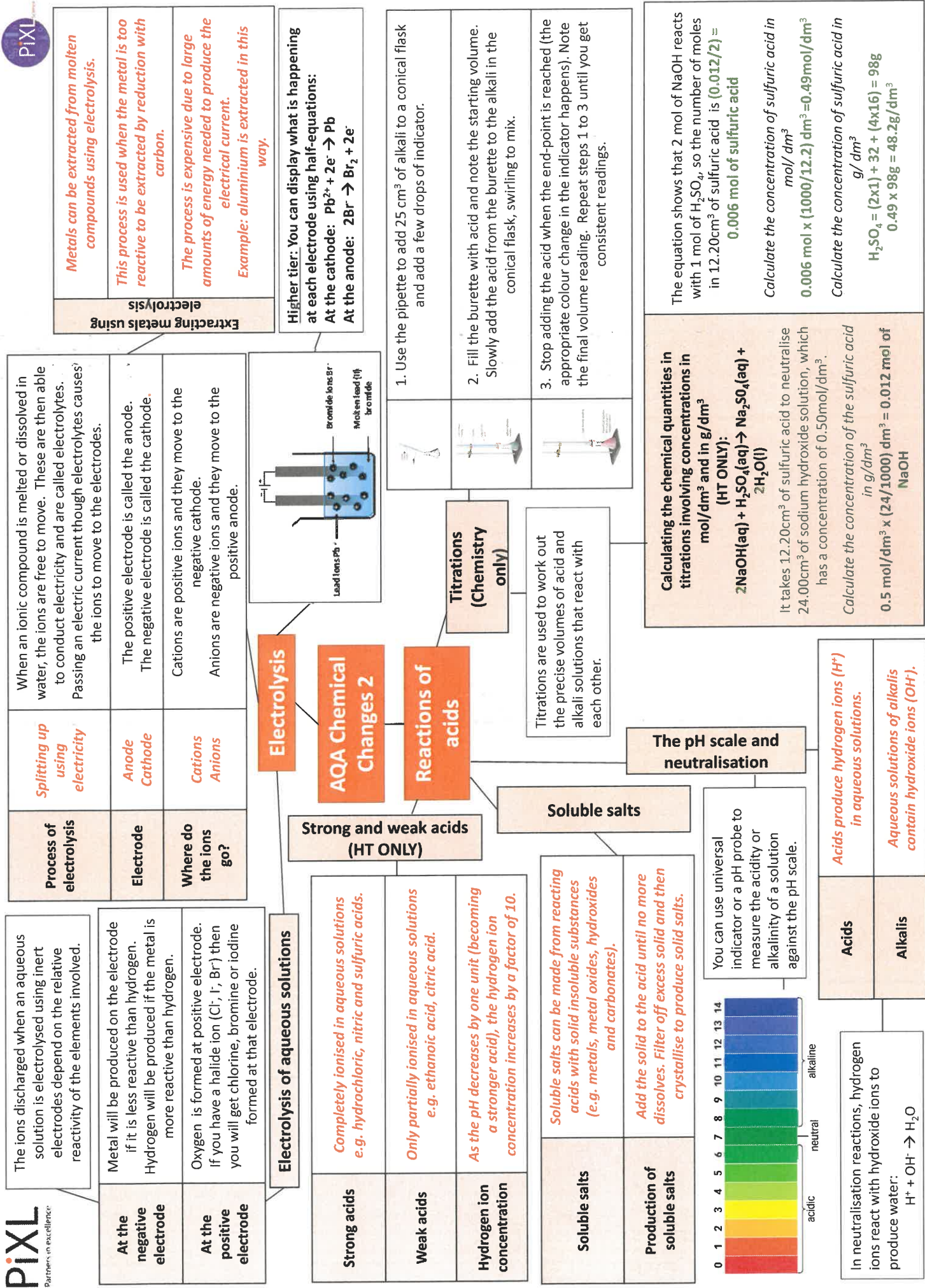
| Reaction with acids                | metal + acid → metal salt + hydrogen |
|------------------------------------|--------------------------------------|
| Extraction of metals and reduction |                                      |
| Reactions with acid                |                                      |
| Reactions with water               |                                      |
| Group 1 metals                     |                                      |
| Group 2 metals                     |                                      |
| Zinc, iron and copper              |                                      |



more reactive metal can displace a less reactive metal from a solution

more reactive metal can displace a less reactive metal from a solution





|                    |                                                                                            |                                                                                                            |
|--------------------|--------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| <b>Endothermic</b> | Energy is taken in from the surroundings so the temperature of the surroundings decreases  | <ul style="list-style-type: none"> <li>Thermal decomposition</li> <li>Sports injury packs</li> </ul>       |
| <b>Exothermic</b>  | Energy is transferred to the surroundings so the temperature of the surroundings increases | <ul style="list-style-type: none"> <li>Combustion</li> <li>Hand warmers</li> <li>Neutralisation</li> </ul> |

|                          |                                              |
|--------------------------|----------------------------------------------|
| <b>Reaction profiles</b> | Show the overall energy change of a reaction |
|--------------------------|----------------------------------------------|

|                                    |                     |
|------------------------------------|---------------------|
| <b>Breaking bonds in reactants</b> | Endothermic process |
| <b>Making bonds in products</b>    | Exothermic process  |

|                                            |                    |                                                                                               |
|--------------------------------------------|--------------------|-----------------------------------------------------------------------------------------------|
| <b>Overall energy change of a reaction</b> | <b>Exothermic</b>  | Energy released making new bonds is greater than the energy taken in breaking existing bonds. |
|                                            | <b>Endothermic</b> | Energy needed to break existing bonds is greater than the energy released making new bonds.   |

|                                                                                                                                       |  |
|---------------------------------------------------------------------------------------------------------------------------------------|--|
| <b>Bond energy calculation</b>                                                                                                        |  |
| Calculate the overall energy change for the forward reaction<br>$\text{N}_2 + 3\text{H}_2 \rightleftharpoons 2\text{NH}_3$<br>N≡N 945 |  |
| Bond energies (in kJ/mol): H-H 436, H-N 391,                                                                                          |  |
| Bond breaking: $945 + (3 \times 436) = 945 + 1308 = 2253 \text{ kJ/mol}$                                                              |  |
| Bond making: $6 \times 391 = 2346 \text{ kJ/mol}$                                                                                     |  |
| Overall energy change = $2253 - 2346 = -93 \text{ kJ/mol}$                                                                            |  |
| Therefore reaction is exothermic overall.                                                                                             |  |

### Types of reaction

### The energy change of reactions (HT only)

### AQA GCSE Energy changes

### Cells and batteries (Chemistry only)

|                               |                                                                                                              |                                                                                      |
|-------------------------------|--------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| <b>Simple cell</b>            | Make a simple cell by connecting two different metals in contact with an electrolyte                         | Increase the voltage by increasing the reactivity difference between the two metals. |
| <b>Batteries</b>              | Consist of two or more cells connected together in series to provide a greater voltage.                      |                                                                                      |
| <b>Non-rechargeable cells</b> | Stop when one of the reactants has been used up                                                              | Alkaline batteries                                                                   |
| <b>Rechargeable cells</b>     | Can be recharged because the chemical reactions are reversed when an external electrical current is supplied | Rechargeable batteries                                                               |

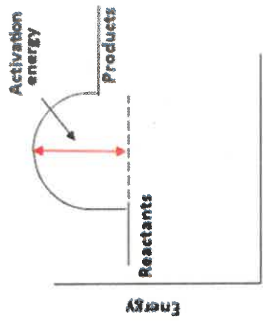
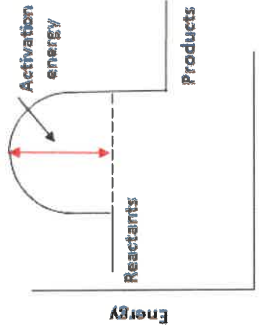
|                                                                                                                        |                                                                                                                                  |                                                                                                                                 |
|------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <b>Ionic half equations</b>                                                                                            | Negative electrode:<br>$2\text{H}_2(\text{g}) + 4\text{OH}^-(\text{aq}) \rightarrow 4\text{H}_2\text{O}(\text{l}) + 4\text{e}^-$ | Positive electrode:<br>$\text{O}_2(\text{g}) + 2\text{H}_2\text{O}(\text{l}) + 4\text{e}^- \rightarrow 4\text{OH}^-(\text{aq})$ |
| <b>Hydrogen fuel cells</b>                                                                                             |                                                                                                                                  |                                                                                                                                 |
| Word equation:<br>hydrogen + oxygen → water                                                                            |                                                                                                                                  |                                                                                                                                 |
| Symbol equation:<br>$2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$                                         |                                                                                                                                  |                                                                                                                                 |
| Advantages:                                                                                                            |                                                                                                                                  |                                                                                                                                 |
| <ul style="list-style-type: none"> <li>No pollutants produced</li> <li>Can be a range of sizes</li> </ul>              |                                                                                                                                  |                                                                                                                                 |
| Disadvantages:                                                                                                         |                                                                                                                                  |                                                                                                                                 |
| <ul style="list-style-type: none"> <li>Hydrogen is highly flammable</li> <li>Hydrogen is difficult to store</li> </ul> |                                                                                                                                  |                                                                                                                                 |

### Fuel cells (Chemistry only)

### Reaction profiles

Activation energy  
Chemical reactions only happen when particles collide with sufficient energy

The minimum amount of energy that colliding particles must have in order to react is called the activation energy.

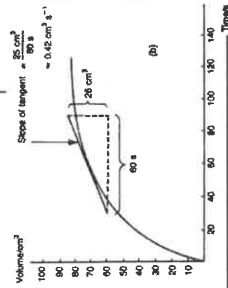
|                    |                                                                                     |                                                                                                                                                                                                                                                              |
|--------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Endothermic</b> |   | Products are at a higher energy level than the reactants. As the reactants form products, energy is transferred from the surroundings to the reaction mixture. The temperature of the surroundings decreases because energy is taken in during the reaction. |
| <b>Exothermic</b>  |  | Products are at a lower energy level than the reactants. When the reactants form products, energy is transferred to the surroundings. The temperature of the surroundings increases because energy is released during the reaction.                          |



|                           |                                                                                                             |                                                                      |
|---------------------------|-------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| Rate of chemical reaction | <i>This can be calculated by measuring the quantity of reactant used or product formed in a given time.</i> |                                                                      |
|                           |                                                                                                             | Rate = $\frac{\text{quantity of reactant used}}{\text{time taken}}$  |
|                           |                                                                                                             | Rate = $\frac{\text{quantity of product formed}}{\text{time taken}}$ |

| Quantity                | Unit                                                                           |
|-------------------------|--------------------------------------------------------------------------------|
| <b>Mass</b>             | Grams (g)                                                                      |
| <b>Volume</b>           | cm <sup>3</sup>                                                                |
| <b>Rate of reaction</b> | Grams per cm <sup>3</sup> (g/cm <sup>3</sup> )<br>HT: moles per second (mol/s) |

### Calculating rates of reactions

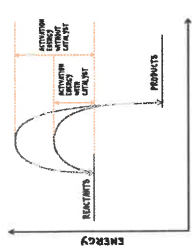


## Rate of reaction

## AQA GCSE The rate and extent of chemical change

## Reversible reactions and dynamic equilibrium

|                          |                                                                                                                          |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------|
| <b>Catalysts</b>         | A catalyst changes the rate of a chemical reaction but is not used in the reaction. These are biological catalysts.      |
| <b>Enzymes</b>           | Catalysts provide a different reaction pathway where reactants do not require as much energy to react when they collide. |
| <b>How do they work?</b> |                                                                                                                          |



If a catalyst is used in a reaction, it is not shown in the word equation.

### Reversible reactions

|                                          |                                                                                                                                             |
|------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Reversible reactions</b>              | In some chemical reactions, the products can react again to re-form the reactants.                                                          |
| <b>Representing reversible reactions</b> | $A + B \rightleftharpoons C + D$                                                                                                            |
| <b>The direction</b>                     | The direction of reversible reactions can be changed by changing conditions:<br>$A + B \xrightleftharpoons[\text{cool}]{\text{heat}} C + D$ |

### Energy changes and reversible reactions

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

### Changing conditions and equilibrium (HT)

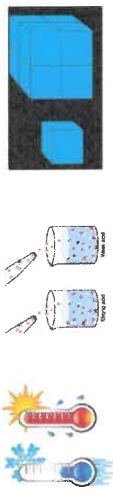
The relative amounts of reactants and products at equilibrium depend on the conditions of the reaction.

When a reversible reaction occurs in apparatus which prevents the escape of reactants and products, equilibrium is reached when the forward and reverse reactions occur exactly at the same rate.

### Equilibrium in reversible reactions

For example:  
 $\text{Hydrated copper sulfate} \rightleftharpoons \text{Anhydrous copper sulfate} + \text{Water}$   
 endothermic (forward)  
 exothermic (reverse)

| Factors affecting the rate of reaction |                                                                                               |
|----------------------------------------|-----------------------------------------------------------------------------------------------|
| <b>Temperature</b>                     | <i>The higher the temperature, the quicker the rate of reaction.</i>                          |
| <b>Concentration</b>                   | <i>The higher the concentration, the quicker the rate of reaction.</i>                        |
| <b>Surface area</b>                    | <i>The larger the surface area of a reactant solid, the quicker the rate of reaction.</i>     |
| <b>Pressure (of gases)</b>             | <i>When gases react, the higher the pressure upon them, the quicker the rate of reaction.</i> |



### Collision theory and activation energy

|                          |                                                                                                                  |                                                                                                                                                                         |
|--------------------------|------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Collision theory</b>  | <i>Chemical reactions can only occur when reacting particles collide with each other with sufficient energy.</i> | Increasing the temperature increases the frequency of collisions and makes the collisions more energetic, therefore increasing the rate of reaction.                    |
| <b>Activation energy</b> | <i>This is the minimum amount of energy colliding particles in a reaction need in order to react.</i>            | Increasing the concentration, pressure (gases) and surface area (solids) of reactions increases the frequency of collisions, therefore increasing the rate of reaction. |

|                                              |                                                                                                                                                                                                                                                           |
|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Le Chatelier's Principles</b>             | States that when a system experiences a disturbance (change in condition), it will respond to restore a new equilibrium state.                                                                                                                            |
| <b>Changing concentration</b>                | If the concentration of a reactant is increased, more products will be formed.<br>If the concentration of a product is decreased, more reactants will react.                                                                                              |
| <b>Changing temperature</b>                  | If the temperature of a system at equilibrium is increased:<br>- Exothermic reaction = products decrease<br>- Endothermic reaction = products increase                                                                                                    |
| <b>Changing pressure (gaseous reactions)</b> | For a gaseous system at equilibrium:<br>- Pressure increase = equilibrium position shifts to side of equation with smaller number of molecules.<br>- Pressure decrease = equilibrium position shifts to side of equation with larger number of molecules. |

| Mechanical | Force acts upon an object              |
|------------|----------------------------------------|
| Electrical | Electric current flow                  |
| Heat       | Temperature difference between objects |
| Radiation  | Electromagnetic waves or sound         |

|                                |                                                    |                                                                                                                                                                        |
|--------------------------------|----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Kinetic energy                 | Energy stored by a moving object                   | $\frac{1}{2} \times \text{mass} \times (\text{speed})^2$<br>$\frac{1}{2} \text{ mv}^2$                                                                                 |
| Elastic Potential energy       | Energy stored in a stretched spring, elastic band  | $\frac{1}{2} \times \text{spring constant} \times (\text{extension})^2$<br>$\frac{1}{2} \text{ ke}^2$<br>(Assuming the limit of proportionality has not been exceeded) |
| Gravitational Potential energy | Energy gained by an object raised above the ground | Mass $\times$ gravitational field strength $\times$ height<br>$\text{mgh}$                                                                                             |

| System                  | An object or group of objects that interact together                                                                |                                                                                       |
|-------------------------|---------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Energy stores           | Kinetic, chemical, internal (thermal), gravitational potential, elastic potential, magnetic, electrostatic, nuclear | EG: Kettle boiling water.<br>Energy is gained or lost from the object or device.      |
| Ways to transfer energy | Light, sound, electricity, thermal, kinetic are ways to transfer from one store to another store of energy.         | EG: electrical energy transfers chemical energy into thermal energy to heat water up. |
| Unit                    | Joules (J)                                                                                                          |                                                                                       |

|       |                                                       |                                                                    |                                                                                                           |
|-------|-------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| Work  | Doing work transfers energy from one store to another | By applying a force to move an object the energy store is changed. | Work done = Force $\times$ distance moved<br>$W = Fs$                                                     |
| Power | The rate of energy transfer                           | 1 Joule of energy per second = 1 watt of power                     | Power = energy transfer $\div$ time<br>$P = E \div t$<br>Power = work done $\div$ time,<br>$P = W \div t$ |

|                        | Units                                                              |
|------------------------|--------------------------------------------------------------------|
| Specific Heat Capacity | Joules per Kilogram degree Celsius ( $\text{J/Kg}^\circ\text{C}$ ) |
| Temperature change     | Degrees Celsius ( $^\circ\text{C}$ )                               |
| Work done              | Joules (J)                                                         |
| Force                  | Newton (N)                                                         |
| Distance moved         | Metre (m)                                                          |
| Power                  | Watts (W)                                                          |
| Time                   | Seconds (s)                                                        |

|               |                                                |
|---------------|------------------------------------------------|
| Useful energy | <i>Energy transferred and used</i>             |
| Wasted energy | <i>Dissipated energy, stored less usefully</i> |

|        |                    |               |
|--------|--------------------|---------------|
| Prefix | <i>Multiple</i>    | Standard form |
| Kilo   | <i>1000</i>        | $10^3$        |
| Mega   | <i>1000 000</i>    | $10^6$        |
| Giga   | <i>100 000 000</i> | $10^9$        |

Change in thermal energy = mass  $\times$  specific heat capacity  $\times$  temperature change  
 $\Delta E = m \times c \times \Delta\theta$

HIGHER: efficiency can be increased using machines.

Efficiency = Useful power output  
Total power input

Efficiency = Useful output energy transfer  
Total input energy transfer

Efficiency

How much energy is usefully transferred

To scatter in all directions or to use wastefully

When energy is 'wasted', it dissipates into the surroundings as internal (thermal) energy.

Ways to reduce 'wasted' energy

Insulation, streamline design, lubrication of moving parts.

The amount of energy always stays the same.

Energy cannot be created or destroyed, only changed from one store to another.

Principle of conservation of energy

|                                | Units                                 |
|--------------------------------|---------------------------------------|
| Energy (KE, EPE, GPE, thermal) | Joules (J)                            |
| Velocity                       | Metres per second ( $\text{m/s}$ )    |
| Spring constant                | Newton per metre ( $\text{N/m}$ )     |
| Extension                      | Metres (m)                            |
| Mass                           | Kilogram (kg)                         |
| Gravitational field strength   | Newton per kilogram ( $\text{N/Kg}$ ) |
| Height                         | Metres (m)                            |

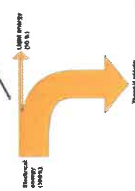
Reducing friction - using wheels, applying lubrication. Reducing air resistance - travelling slowly, streamlining.

## Energy Conservation and Dissipation

Energy stores and changes

AQA ENERGY - part 1

|               |                                     |
|---------------|-------------------------------------|
| Closed system | No change in total energy in system |
| Open system   | Energy can dissipate                |



HIGHER: When an object is moved, energy is transferred by doing work.

Work done = Force  $\times$  distance moved

Frictional forces cause energy to be transferred as thermal energy. This is wasted.



Using renewable energy will need to increase to meet demand.

Renewable energy makes up about 20% of energy consumption.

Fossil fuel reserves are running out.

Energy demand is increasing as population increases.

*These will run out. It is a finite reserve. It cannot be replenished.*

*These will never run out. It is an infinite reserve. It can be replenished.*

e.g. Fossil fuels (coal, oil and gas) and nuclear fuels.

e.g. Solar, Tides, Waves, Wind, Geothermal, Biomass, Hydroelectric

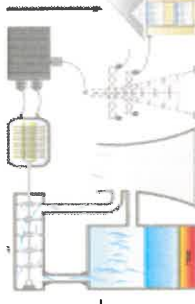
Using fuels

Energy resources

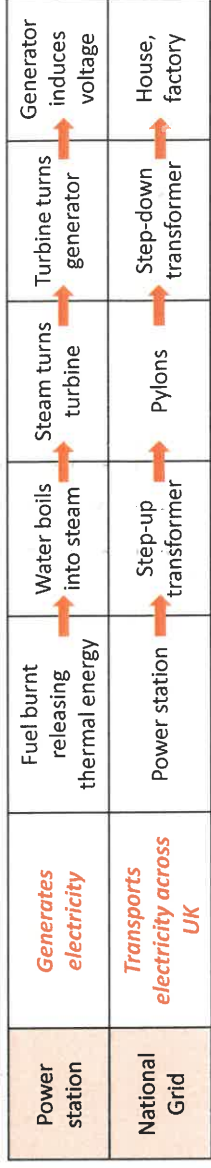
Global Energy Resources

AQA ENERGY – part 2

National Grid



**Power station – NB: You need to understand the principle behind generating electricity. An energy resource is burnt to make steam to drive a turbine which drives the generator.**



| Energy resource                  | How it works                                                                             | Uses                                          | Positive                                                                                                                                | Negative                                                                                                                                                                                                                                                                     |
|----------------------------------|------------------------------------------------------------------------------------------|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Fossil Fuels (coal, oil and gas) | <i>Burnt to release thermal energy used to turn water into steam to turn turbines</i>    | Generating electricity, heating and transport | Provides most of the UK energy. Large reserves. Cheap to extract. Used in transport, heating and making electricity. Easy to transport. | Non-renewable. Burning coal and oil releases sulfur dioxide. When mixed with rain makes acid rain. Acid rain damages building and kills plants. Burning fossil fuels releases carbon dioxide which contributes to global warming. Serious environmental damage if oil spilt. |
| Nuclear                          | <i>Nuclear fission process</i>                                                           | Generating electricity                        | No greenhouse gases produced. Lots of energy produced from small amounts of fuel.                                                       | Non-renewable. Dangers of radioactive materials being released into air or water. Nuclear sites need high levels of security. Start up costs and decommission costs very expensive. Toxic waste needs careful storing.                                                       |
| Biofuel                          | <i>Plant matter burnt to release thermal energy</i>                                      | Transport and generating electricity          | Renewable. As plants grow, they remove carbon dioxide. They are 'carbon neutral'.                                                       | Large areas of land needed to grow fuel crops. Habitats destroyed and food not grown. Emits carbon dioxide when burnt thus adding to greenhouse gases and global warming.                                                                                                    |
| Tides                            | <i>Every day tides rise and fall, so generation of electricity can be predicted</i>      | Generating electricity                        | Renewable. Predictable due to consistency of tides. No greenhouse gases produced.                                                       | Expensive to set up. A dam like structure is built across an estuary, altering habitats and causing problems for ships and boats.                                                                                                                                            |
| Waves                            | <i>Up and down motion turns turbines</i>                                                 | Generating electricity                        | Renewable. No waste products.                                                                                                           | Can be unreliable depends on wave output as large waves can stop the pistons working.                                                                                                                                                                                        |
| Hydroelectric                    | <i>Falling water spins a turbine</i>                                                     | Generating electricity                        | Renewable. No waste products.                                                                                                           | Habitats destroyed when dam is built.                                                                                                                                                                                                                                        |
| Wind                             | <i>Movement causes turbine to spin which turns a generator</i>                           | Generating electricity                        | Renewable. No waste products.                                                                                                           | Unreliable – wind varies. Visual and noise pollution. Dangerous to migrating birds.                                                                                                                                                                                          |
| Solar                            | <i>Directly heats objects in solar panels or sunlight captured in photovoltaic cells</i> | Generating electricity and some heating       | Renewable. No waste products.                                                                                                           | Making and installing solar panels expensive. Unreliable due to light intensity.                                                                                                                                                                                             |
| Geothermal                       | <i>Hot rocks under the ground heats water to produce steam to turn turbine</i>           | Generating electricity and heating            | Renewable. Clean. No greenhouse gases produced.                                                                                         | Limited to a small number of countries. Geothermal power stations can cause earthquake tremors.                                                                                                                                                                              |

Electrons are free to move in metal.

| Cell                     | Battery                     | Switch                              | Lamp                      | Ammeter          | Volt meter                    | Diode                 | LED                            | LDR                            | Fuse                           | Resistor                            | Variable resistor           | Thermistor                  |
|--------------------------|-----------------------------|-------------------------------------|---------------------------|------------------|-------------------------------|-----------------------|--------------------------------|--------------------------------|--------------------------------|-------------------------------------|-----------------------------|-----------------------------|
| Store of chemical energy | Two or more cells in series | Breaks circuit, turning current off | Lights when current flows | Measures current | Measures potential difference | Current flows one way | Emits light when current flows | Resistance low in bright light | Melts when current is too high | Affects the size of current flowing | Allows current to be varied | Resistance low at high temp |

### Circuit symbols

| Current                                       | Ampere (A)   |
|-----------------------------------------------|--------------|
| Flow of electrical charge                     |              |
| Potential difference (p.d.)                   | Volts (V)    |
| How much electrical work is done by a cell    |              |
| Charge                                        | Coulombs (C) |
| Amount of electricity travelling in a circuit |              |

|                         |                                                     |
|-------------------------|-----------------------------------------------------|
| Charge = Current X time | $Q = I \times t$                                    |
| Changing current        | Change the p.d. of the cells<br>Add more components |

### Controlling current

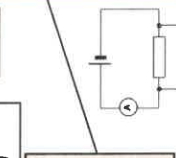
|           |                                  |
|-----------|----------------------------------|
| Ammeter   | Set up in series with components |
| Voltmeter | Set up parallel to components    |

|                                                                          |                                                   |
|--------------------------------------------------------------------------|---------------------------------------------------|
| Resistance ( $\Omega$ )                                                  | A measurement of how much current flow is reduced |
| The higher the resistance, the more difficult it is for current to flow. |                                                   |
| Increasing resistance, reduces current.                                  |                                                   |
| Increasing voltage, increases current.                                   |                                                   |

|                  |                                                                                              |
|------------------|----------------------------------------------------------------------------------------------|
| Ohmic conduct or | At a constant temperature, current is directly proportional to the p.d. across the resistor. |
| Filament lamp    | As current increases, the resistance increases. The temperature increases as current flows.  |
| Diode            | Current flows when p.d. flows forward. Very high resistance in reverse.                      |

## Current, potential difference and resistance

### Current and Charge



$R = V \div I$

Resistance = Potential difference  $\div$  Current

### Series and parallel circuits

|                  |                                                       |
|------------------|-------------------------------------------------------|
| Series circuit   | Current is the same in all components.                |
| Parallel circuit | Total current is the sum of each component's current. |

|                                                               |                                                                                         |
|---------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| Total p.d. from battery is shared between all the components. | Total resistance is the sum of each component's resistance.                             |
| p.d. across all components is the same.                       | Total resistance is less than the resistance value of the smallest individual resistor. |

| Series                                                       | Parallel                         |
|--------------------------------------------------------------|----------------------------------|
| A circuit with one loop                                      | A circuit with two or more loops |
| If cells are joined in series, add up individual cell values |                                  |

### Energy transfers

Work is done when charge flowing.

Power (W) = potential difference X current

$R = V \times I$

Power = (current)<sup>2</sup> X resistance

$P = I^2 \times R$

Energy transferred = Power X time

$E = P \times t$

### AQA Electricity

### Domestic uses and safety



Distributes electricity generated in power stations around UK

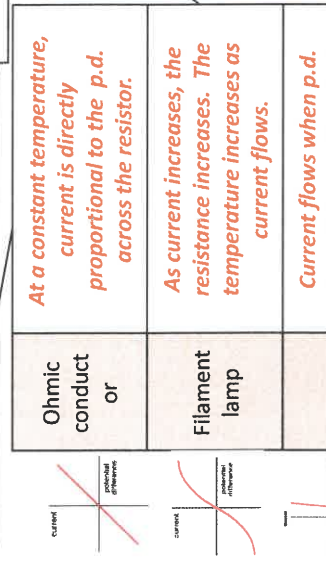
National Grid

| Alternating current                                                     | Direct current                                                  |
|-------------------------------------------------------------------------|-----------------------------------------------------------------|
| p.d. switches direction many times a second, current switches direction | p.d. remains in one direction, current flows the same direction |
| Generator.                                                              | Cell or battery.                                                |

| Thermistor                                     | LDR                                      |
|------------------------------------------------|------------------------------------------|
| Resistance varies with temperature             | Resistance varies with light intensity   |
| Resistance decreases as temperature increases. | Resistance decreases as light increases. |

|                                                              |                      |
|--------------------------------------------------------------|----------------------|
| 'Earthing' a safety device; Earth wire joins the metal case. | Mains supply         |
|                                                              | Frequency 50Hz, 230V |

### Current - Potential difference graphs



### Static electricity

When two insulating material are rubbed together, electrons move from one material to the other.

Electrical charge is stationary

Shocks

Walking on carpet causes friction. Electrons move to the person and charge builds up. When the person touches a metal object, the electrons conduct away, making a spark.

Electric fields

Charged objects create electric fields around them. Strongest closest to the object. The field direction is the direction of force on a positive charge. Add more charge increases field strength.





| State  | Particle arrangement                                                       | Properties                                    |
|--------|----------------------------------------------------------------------------|-----------------------------------------------|
| Solid  | Packed in a regular structure. Strong forces hold in place so cannot move. | Difficult to change shape.                    |
| Liquid | Close together, forces keep contact but can move about.                    | Can change shape but difficult to compress.   |
| Gas    | Separated by large distances. Weak forces so constantly randomly moving.   | Can expand to fill a space, easy to compress. |



### Kinetic theory of gases

Pressure of a fixed volume of gas increases as temperature increases (temperature increases, speed increases, collisions occur more frequently and with more force so pressure increases).

Temperature of gas is linked to the average kinetic energy of the particles.

If kinetic energy increases so does the temperature of gas.

No kinetic energy is lost when gas particles collide with each other or the container.

Gas particles are in a constant state of random motion.

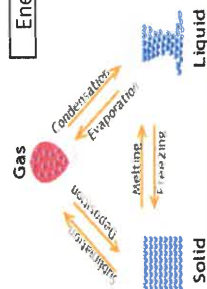
$$P = m \div V$$

$$\text{Density} = \text{mass} \div \text{volume.}$$

**Mass of a substance in a given volume**

**Density**

|                       |                                                             |
|-----------------------|-------------------------------------------------------------|
| Freezing              | Liquid turns to a solid. Internal energy decreases.         |
| Melting               | Solid turns to a liquid. Internal energy increases.         |
| Boiling / Evaporating | Liquid turns to a gas. Internal energy increases.           |
| Condensation          | Gas turns to a liquid. Internal energy decreases.           |
| Sublimation           | Solid turns directly into a gas. Internal energy increases. |
| Conservation of mass  | When substances change state, mass is conserved.            |
| Physical change       | No new substance is made, process can be reversed.          |



## Particle model

### Pressure

**PHYSICS ONLY:** when you do work the temperature increases e.g. pump air quickly into a ball, the air gets hot because as the piston in the pump moves the particles bounce off increasing kinetic energy, which causes a temperature rise.

$$PV = \text{constant.}$$

$$P_1 V_1 = P_2 V_2$$

## AQA PARTICLE MODEL OF MATTER

## Internal energy and energy transfers

### Change of state

|                                      |                                                                                  |
|--------------------------------------|----------------------------------------------------------------------------------|
| Specific Latent Heat                 | Energy needed to change 1kg of a substance's state                               |
| Specific Latent Heat of Fusion       | Energy needed to change 1kg of solid into 1 kg of liquid at the same temperature |
| Specific Latent Heat of Vaporisation | Energy needed to change 1kg of liquid into 1 kg of gas at the same temperature   |

$$\text{Energy needed} = \text{mass} \times \text{specific latent heat.}$$

$$\Delta E = m \times L$$

Energy needed to raise 1kg of substance by 1°C

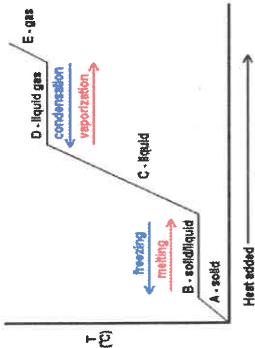
**Specific Heat Capacity**

- Depends on:
- Mass of substance
  - What the substance is
  - Energy put into the system.

Change in thermal energy = mass  $\times$  specific heat capacity  $\times$  temperature change.

$$\Delta E = m \times c \times \Delta \theta$$

|                        |                                                   |                                                                                                                                                                                                            |
|------------------------|---------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Internal energy</b> | Energy stored inside a system by particles        | Internal energy is the total kinetic and potential energy of all the particles (atoms and molecules) in a system.                                                                                          |
|                        | Heating changes the energy stored within a system | Heating causes a change in state. As particles separate, potential energy stored increases. Heating increases the temperature of a system. Particles move faster so kinetic energy of particles increases. |



|                          | Units                                       |
|--------------------------|---------------------------------------------|
| Density                  | Kilograms per metre cubed (kg/m³)           |
| Mass                     | Kilograms (kg)                              |
| Volume                   | Metres cubed (m³)                           |
| Energy needed            | Joules (J)                                  |
| Specific latent heat     | Joule per kilogram (J/kg)                   |
| Change in thermal energy | Joules (J)                                  |
| Specific heat capacity   | Joule per kilogram degrees Celsius (J/kg°C) |
| Temperature change       | Degrees Celsius (°C)                        |
| Pressure                 | Pascals (Pa)                                |

Radius of an atom  
 $1 \times 10^{-10}\text{m}$

Electrons gained  
Negative ion

Electrons lost  
Positive ion

| Atom          | Same number of protons and electrons   |  |
|---------------|----------------------------------------|--|
| Ion           | Unequal number of electrons to protons |  |
| Mass number   | Number of protons and neutrons         |  |
| Atomic number | Number of protons                      |  |

| Particle | Charge | Size | Found              |
|----------|--------|------|--------------------|
| Neutron  | None   | 1    | In the nucleus     |
| Proton   | +      | 1    | In the nucleus     |
| Electron | -      | Tiny | Orbits the nucleus |



*Different forms of an element with the same number of protons but different number of neutrons*

### Discovery of the nucleus

|                           |                                                                                                                                                                                                                                                                                                   |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Democritus                | Suggested idea of atoms as small spheres that cannot be cut.                                                                                                                                                                                                                                      |
| J J Thomson (1897)        | Discovered electrons – emitted from surface of hot metal. Showed electrons are negatively charged and that they are much less massive than atoms.                                                                                                                                                 |
| Thomson (1904)            | Proposed 'plum pudding' model – atoms are a ball of positive charge with negative electrons embedded in it.                                                                                                                                                                                       |
| Geiger and Marsden (1909) | Directed beam of alpha particles ( $\text{He}^{2+}$ ) at a thin sheet of gold foil. Found some travelled through, some were deflected, some bounced back.                                                                                                                                         |
| Rutherford (1911)         | Used above evidence to suggest alpha particles deflected due to electrostatic interaction between the very small charged nucleus, nucleus was massive. Proposed mass and positive charge contained in nucleus while electrons found outside the nucleus which cancel the positive charge exactly. |
| Bohr (1913)               | Suggested modern model of atom – electrons in circular orbits around nucleus, electrons can change orbits by emitting or absorbing electromagnetic radiation. His research led to the idea of some particles within the nucleus having positive charge; these were named protons.                 |
| Chadwick (1932)           | Discovered neutrons in nucleus – enabling other scientists to account for mass of atom.                                                                                                                                                                                                           |

### Atom structure



|                   |                                                         |
|-------------------|---------------------------------------------------------|
| Radioactive decay | Unstable atoms randomly emit radiation to become stable |
| Detecting         | Use Geiger Muller tube                                  |
| Unit              | Becquerel                                               |
| Ionisation        | All radiation ionises                                   |

### Atoms and Isotopes

### Atoms and Nuclear Radiation

### AQA ATOMIC STRUCTURE

### PHYSICS ONLY: Hazards and uses of Radioactive emissions and of background radiation

### Nuclear fission and fusion

### PHYSICS ONLY: Nuclear energy

| Decay | Range in air    | Ionising power | Penetration power     |
|-------|-----------------|----------------|-----------------------|
| Alpha | Few cm          | Very strong    | Stopped by paper      |
| Beta  | Few m           | Medium         | Stopped by Aluminium  |
| Gamma | Great distances | Weak           | Stopped by thick lead |

| Decay              | Emitted from nucleus                | Changes in mass number and atomic number |
|--------------------|-------------------------------------|------------------------------------------|
| Alpha ( $\alpha$ ) | Helium nuclei ( ${}^4_2\text{He}$ ) | -4      -2                               |
| Beta ( $\beta$ )   | Electron ( ${}^0_{-1}\text{e}$ )    | 0      +1                                |
| Gamma ( $\gamma$ ) | Electromagnetic wave                | 0      0                                 |
| Neutron            | Neutron                             | -1      0                                |

|               |                                            |
|---------------|--------------------------------------------|
| Contamination | Unwanted presence of radioactive atoms     |
| Irradiation   | Person is in exposed to radioactive source |

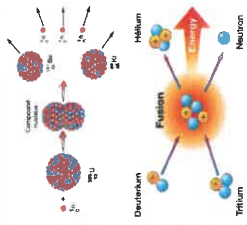
Half life  
The time taken to lose half of its initial radioactivity

|            |                                                                                             |
|------------|---------------------------------------------------------------------------------------------|
| Sievert    | Unit measuring dose of radiation                                                            |
| Background | Constant low level environmental radiation, e.g. from nuclear testing, nuclear power, waste |

|                   |                                              |
|-------------------|----------------------------------------------|
| Uses              | Different isotopes have different half lives |
| Tracers           | Used within body                             |
| Radiation therapy | Used to treat illnesses e.g. cancer          |

|              |                                                                                                       |
|--------------|-------------------------------------------------------------------------------------------------------|
| Fuel rods    | Made of U-238, 'enriched' with U-235 (3%). Long and thin to allow neutrons to escape, hitting nuclei. |
| Control rods | Made of Boron. Controls the rate of reaction. Boron absorbs excess neutrons.                          |
| Concrete     | Neutrons hazardous to humans – thick concrete shield protects workers.                                |

|                 |                                                              |                                                                                                                                                  |                                        |
|-----------------|--------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| Nuclear fission | One large unstable nucleus splits to make two smaller nuclei | Neutron hits U-235 nucleus, nucleus absorbs neutron, splits emitting two or three neutrons and two smaller nuclei. Process also releases energy. | Process repeats, chain reaction formed |
| Nuclear fusion  | Two small nuclei join to make one larger nucleus             | Difficult to do on Earth – huge amounts of pressure and temperature needed.                                                                      | Used in nuclear power stations         |
|                 |                                                              |                                                                                                                                                  | Occurs in stars                        |



better hope – brighter future



# Education knowledge organiser

## The role of education in society.

### 1. The economic role- teaching skills for work.

**Functionalists:** Teaches skills and knowledge necessary for work. Preparation for real world.  
**Marxists:** This is reinforcing the class system.

### 2. The selective role- Choosing the most able people for the most important jobs.

**Functionalists:** The system is a sieve. Meritocratic system, everyone has equal opportunities to succeed, those who work hard and achieve are rewarded with higher pay levels/status.  
**Marxists:** Education does not provide equal opportunities. Designed to benefit the powerful. This is why working-class children underperform.



### 3. Social Control- teaching acceptance of rules and authority

**Functionalists:** Society must be regulated by rules. Schools are an agency of social control.  
**Marxists:** Social control reflects social control in the wider society which benefits those in power.

### 4. The political role- teaching people to be effective citizens and creating social cohesion.

**Functionalists:** Acceptance of the political system and will exercise their rights wisely (voting)  
**Marxists:** Only certain political opinions and ideas are tolerated, radical ideas are rejected.

## The Hidden Curriculum:

- Hierarchy: The hierarchy in school can be seen to reflect the structure of society and in the workplace.
- Competition: School encourages competition between students e.g. sports, exam results.
- Social Control: Rules, regulations, obedience and respect for authority.
- Gender role allocation: teacher expectations and subject choice
- Lack of satisfaction: Preparing students for boring, meaningless and repetitive jobs is a similar experience to employees at work.



**Social Control: Formal**  
 Discipline, punishment, school rules.

**Social Control: Informal**  
 Peer-group pressure, learning to live and work with others.

**Pre-School** (3-5 years). May be provided through the local authority or private.

**De-schooling:** Illich (1995) argues that schools repress children and promotes passive conformity rather than developing creative individuals. He argues for de-schooling. School should be abolished and people should pursue knowledge and skills with like-minded individuals



| Arguments <b>for</b> vocational education                                                                                                                                                                                                                                                                   | Arguments <b>against</b> vocational education                                                                                                                                                                                                                                                                                                                                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> <li>It will lead to a more skilled, better-qualified workforce that will make Britain more competitive</li> <li>Functionalists believe it shows the importance the education system has to provide skills and expertise needed by industry &amp; the economy.</li> </ul> | <ul style="list-style-type: none"> <li>The emphasis on skills training disguises the fact that the problem is not that young people lack necessary skills for work it's that there is no work for skilled young people.</li> <li>Marxists argue it is viewed as lower status compared to purely academic qualifications.</li> <li>Seen as replicating the Tripartite system</li> </ul> |

**Home education (home schooling):** Teaching children at home rather than in a state or independent school. Parents or tutors usually carry this out. It is a legal option for people who wish to provide a different learning environment or ethos to local schools. Recently raised issues around standards and impact on social development.

**Secondary** (11-16 years). Most provided for by the state in comprehensive schools.

**Further & Higher Education** (16-18 years). Sixth Form, college or apprenticeships.

## Talcott Parsons (Functionalist)

- Schools prepare children for the same **universalistic standards**- the opposite of the **particularistic standards** from home life.
- Schools promote a **value consensus**: encouraged to achieve high and the rewards encourage them to maximise their potential. Students are also competing on equal terms in the classroom.
- Meritocracy**: students achievements are based on their abilities and efforts, not on social class, gender or ethnicity.
- Role allocation: matched to the correct job based on skill/knowledge.

## Functionalist

Education is an important agency of socialisation, it maintains social stability and social cohesion. Prepares young people for working life and adulthood. Teaches specialist skills for work. Education is meritocratic.

## Marxist

Prepares young people for a capitalist society. Education is not meritocratic. Encourages conformity and acceptance of social position. The hidden curriculum teaches young people the expectations of society.

## Feminist

There are inequalities in the education system between boys and girls. It plays a role in socialisation of boys and girls. Even though girls are outperforming boys, education still reinforces patriarchal views.

## Why are independent schools favoured by some?

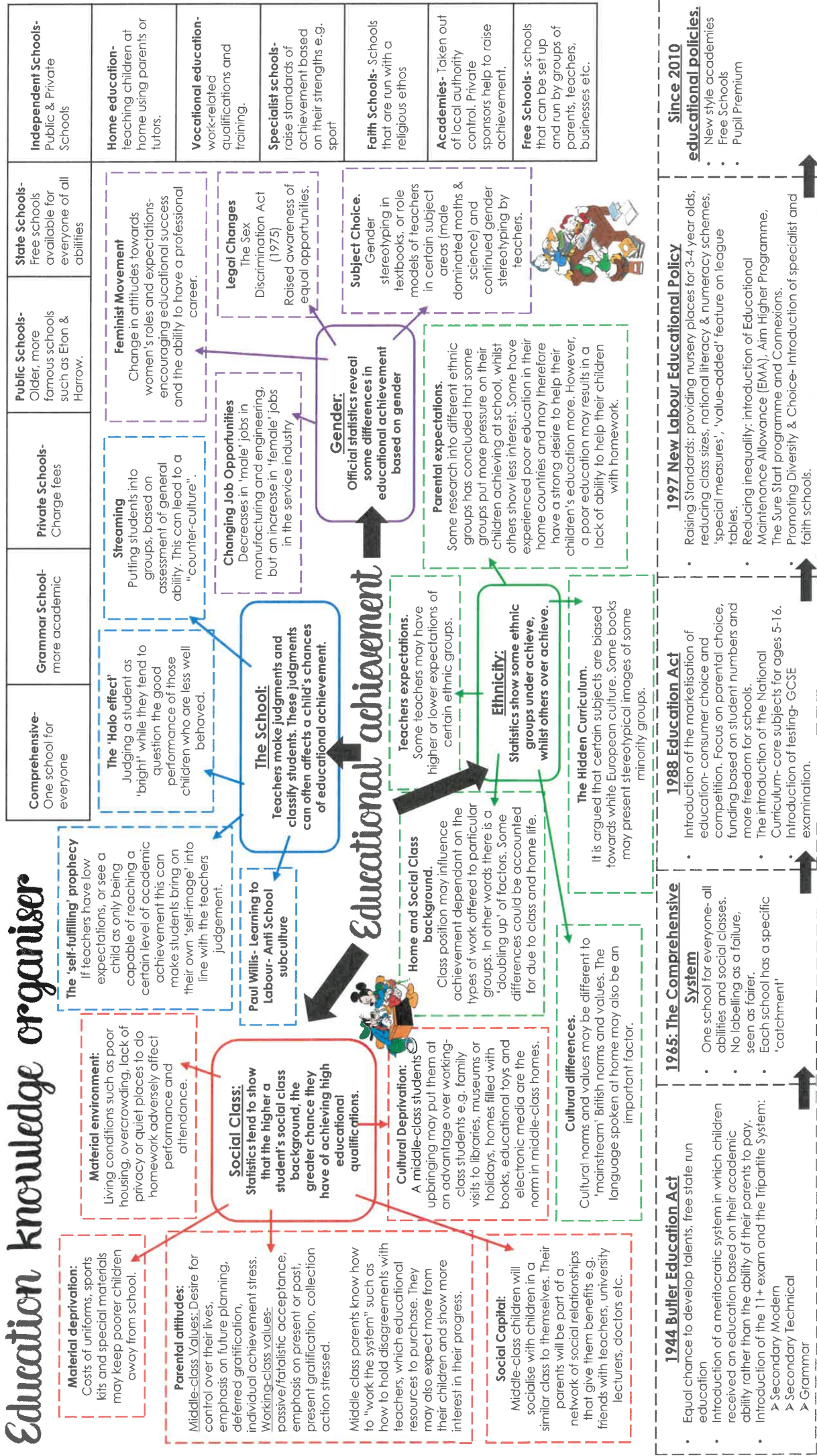
**Why are state schools favoured by others?**

- Lower teacher-student ratio which means smaller classes so students receive more attention
- Resources/ facilities are better
- Academic culture
- Parental input, expectations and support tends to be higher
- Free and not based on ability
- More socially mixed
- Upward social mobility
- Students do not have to travel far on a daily basis

## Key thinkers

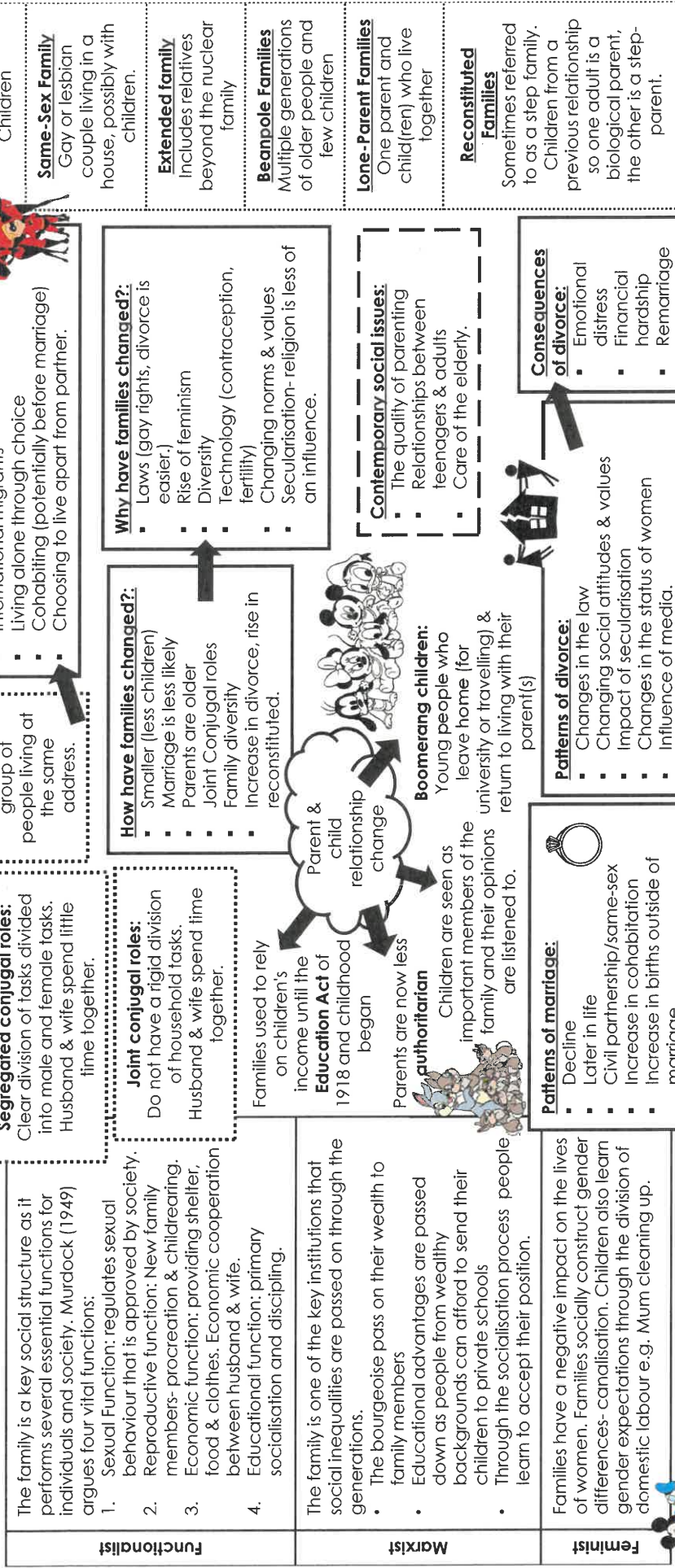
| Emile Durkheim (Functionalist)                                                                                                                                                                                                                                                                                                                                                                                                | Bowles & Gintis (1976) (Marxist)                                                                                                                                                                                                                                                                                                                                                             | Ball, Bowe & Gewirtz (1994)- Parental Choice & Competition                                                                                                                                                                                                                                                                 | Halsey, Heath & Ridge (1980)- Social Class Inequality                                                                                                                                                                                                                                                                                                                     | Ball (1981)- Banding & Teacher expectations                                                                                                                                                                                                                                          | Willis (1977)- Learning to Labour (Marxist)                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The major function of education is learning society's norms and values. Education provides the link between the individual and society. He believed that the school provides a context in which children learn to cooperate with those who are neither their kin nor their friends. Rules should be strictly enforced in order for children to learn self-discipline and to see that misbehaviour damages society as a whole. | The major role of education is the reproduction of labour power. There is a close relationship between the rules which govern the work place and the education system e.g. the creation of a hardworking, docile, obedient. They reject the view that capitalist societies are meritocratic and believe that class background is the most important factor influencing levels of attainment. | A study of fifteen schools in neighbouring LEAs with different population profiles (e.g. class and ethnicity). The study evaluates the impact of parental choice and the publication of league tables, e.g. the pressure to reintroduce streaming and setting and the tendency for some schools to focus on the more able. | The authors found evidence of clear class inequalities in education. They found that an individual from the service class, as compared to one from the working class, had four times as great a chance of being at school at 16. Whilst the chance of an individual from the service class attending university was eleven times greater than one from the working class. | This is a participant observation study. The study describes a school in the process of change and raises questions about the selection and socialisation experienced by two cohorts moving through the school, one banded by ability and the other taught in mixed ability classes. | He believes that education is not a particularly successful agency of socialisation and that education can have unintended consequences that may not be beneficial to capitalism. He described the existence of a counter culture, which was opposed to the values of the school. He concluded their rejection of the school made them suitable candidates for male dominated, unskilled or semi-skilled manual work. |

# Education knowledge organiser





# Families Knowledge Organiser



# Research Methods Knowledge Organiser

## Postal / Email Questionnaires:

- ✓ Quick
- ✓ Easy to send to lots of people (representative & reliable).
- x Response rate is about 10%
- x Might not understand the questions (less valid).

## Structured / Semi-structured Interviews:

- ✓ All participants are asked the same questions (reliable)
- ✓ Can explain what questions mean (valid);
- ✓ Ability to explain answers further in a semi-structured interview (valid).
- x Interviewer bias

## Informal (Unstructured) Interviews:

- ✓ Participants can talk about what is important to them (valid)
- ✓ The researcher can ask the participant what their answers mean (valid).
- x Every interview is different, hard to compare the results of all the interviews (less reliable)

## Group interviews

- ✓ Access a wide range of views and experiences
- ✓ Participants may feel more at ease.
- ✓ Save time and money
- x Some may dominate discussion/everyone might not be heard
- x Cannot assure confidentiality

## Participant observation

- ✓ Watch how participants behave (valid)
- ✓ Can see the world from participants' point of view (valid).
- x If participants know they are being observed, then they will not act naturally
- x The researcher might have to get involved in criminal behaviour (unethical)
- x If participants do not know they are being observed, then they can not give their permission (consent – unethical).

## Official Statistics

- ✓ The data is usually based on the whole population (representative).
- ✓ May be the only source of data
- ✓ Can investigate trends over time
- x Cannot check the validity
- x Could be politically biased

**Qualitative Data:** data presented in words or visual form e.g. diary, photographs, mass media



**Quantitative Data:** data presented in numerical form presented in graphs, pie charts or tables of statistics e.g. official statistics

- ✓ Reliable
- ✓ Relevant
- ✓ Scientific
- ✓ Preferred by Positivists
- x Costly
- x Time consuming
- x Sampling needs to be generalisable

## Primary Research (data collected first hand.)



## Secondary Research (data from previously published sources.)

- ✓ Large Scale
- ✓ Cheap
- ✓ Quick
- ✓ Only way to study historical issues
- ✓ Preferred by Interpretivists
- x Reliability could be questioned
- x Interpretation issues

**Validity:** Data is valid if it gives a true picture of social reality

**Reliability:** Data is seen as reliable if other researchers using the same methods get the same results.

**Ethics:** Research must be carried out in a morally acceptable way



**Representativeness:** Sociologists want the sample they are studying to represent a large group of people

**Generalisation:** Assuming the results are valid, reliable and representative you should be able to generalise your findings

## Closed (or fixed-choice) questions

- ✓ Easy to process and present
- x Doesn't allow for the respondent to expand on their answer

## Open-ended questions

- ✓ Able to give a more detailed answer
- x Difficult to convert into statistics
- x More time consuming to process



**A representative sample:** typical of the wider population

**An unrepresentative sample:** difficult to generalise. Some groups are overrepresented

## Sampling Methods

### Probability (or random) sampling

#### Simple random sampling

Use a computer to generate a random sample, everyone has as much chance as the other.

#### Systematic random sampling

The researcher uses a system to pick the participants (eg. every 10th name on the register).

#### Stratified random sampling

This involves picking people from different groups within the population

### Non-probability sampling

#### Snowball sampling

The researcher selects one person, then asks them to put them in touch with other people, etc.

#### Quota sampling

Each interviewer has an exact number of people from categories that they need e.g. females, teenagers.

#### Purposive sampling

The sample is collected according to a known characteristic e.g. a teacher.

