

# Woldgate School

Of great merit, character & value

Part of the Family



**Wonder**  
Learning Partnership  
Educate | Empower | Engage | Enrich

# Knowledge Book 2024-25

**Name:**

**Form:**

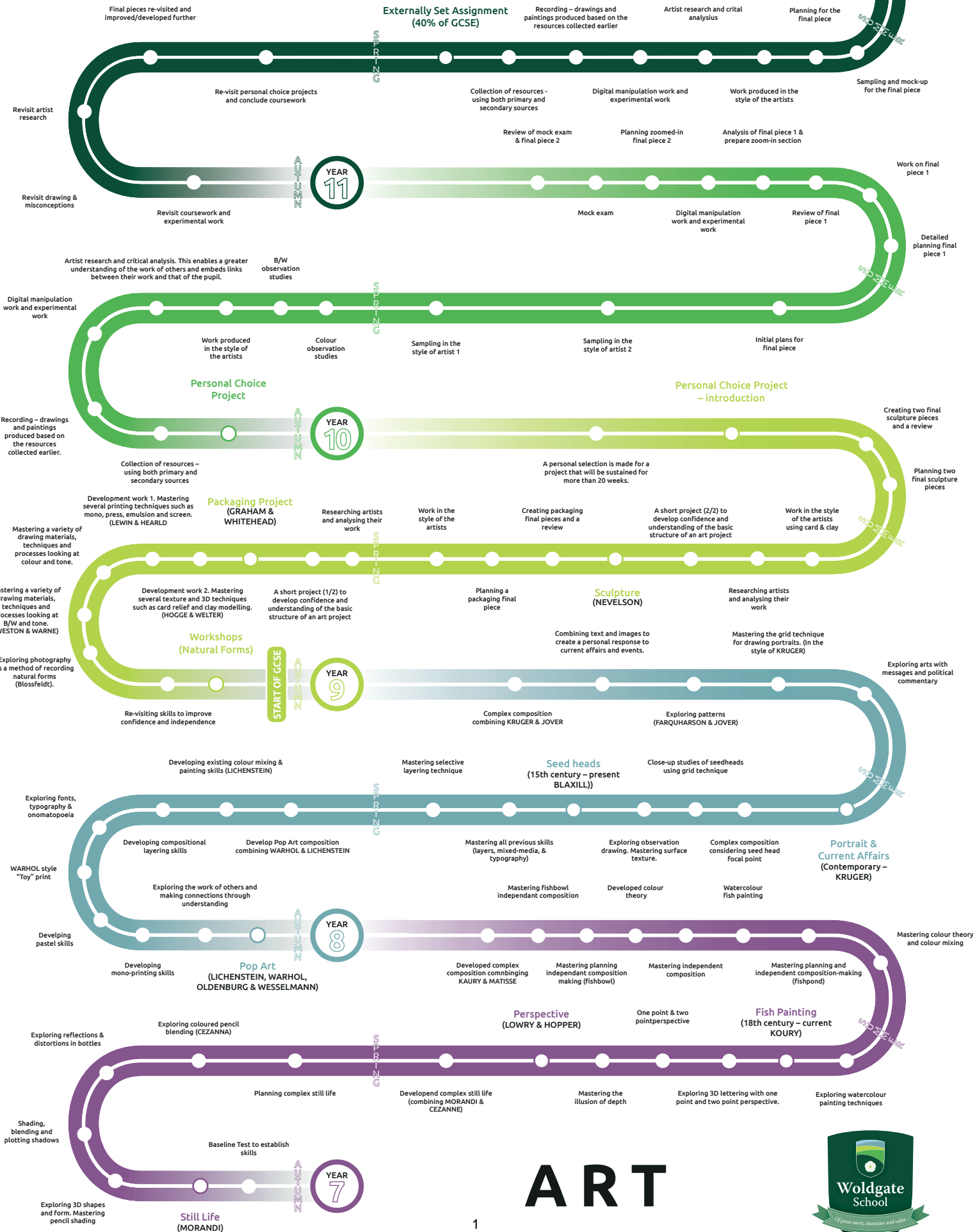
# YEAR

# 9



**GCSE EXAMINATIONS**

Final piece produced under exam conditions (10 hours)



**ART**





# YEAR 9 PACKAGING MINI PROJECT KNOWLEDGE ORGANISERS

- LINE**
- TONE**
- SHAPE & FORM**
- COLOUR**
- TEXTURE**
- PATTERN**



**SALVADOR DALÍ**  
**CHUPA CHUPS**  
**DESIGN (1969)**



## Key Words

### Close Up

Zooming in a the detail or an area of a picture.

### Hyperrealism art

a genre of painting and a sculpture resembling a high-resolution photograph.

### Packaging

colourful material used for wrapping or covering goods to protect them and shows a logo or brand.

### Viewfinder

a window or frame to help select an area of a picture to focus on.

### Zoomed in

focusing on a specific section of an image.

## NANCY WHITEHEAD (1988-)



Nancy Whitehead  
Photorealist Artist based in London producing photorealism and hyperrealism paintings of sweet wrappers and drinks cans.



## POP FIZZ



## SARAH GRAHAM (1977-)



British painter Sarah Graham was born in Hitchin in 1977, and works almost exclusively in oil on canvas. It is her paintings of Chupa Chups that she is perhaps best known.



## PLANNING IDEAS



## FINAL PIECES



**Challenge Tasks:** Produce a range of different compositions when photographing objects. Look at single as well as group arrangements. Try scrunching up the packaging.



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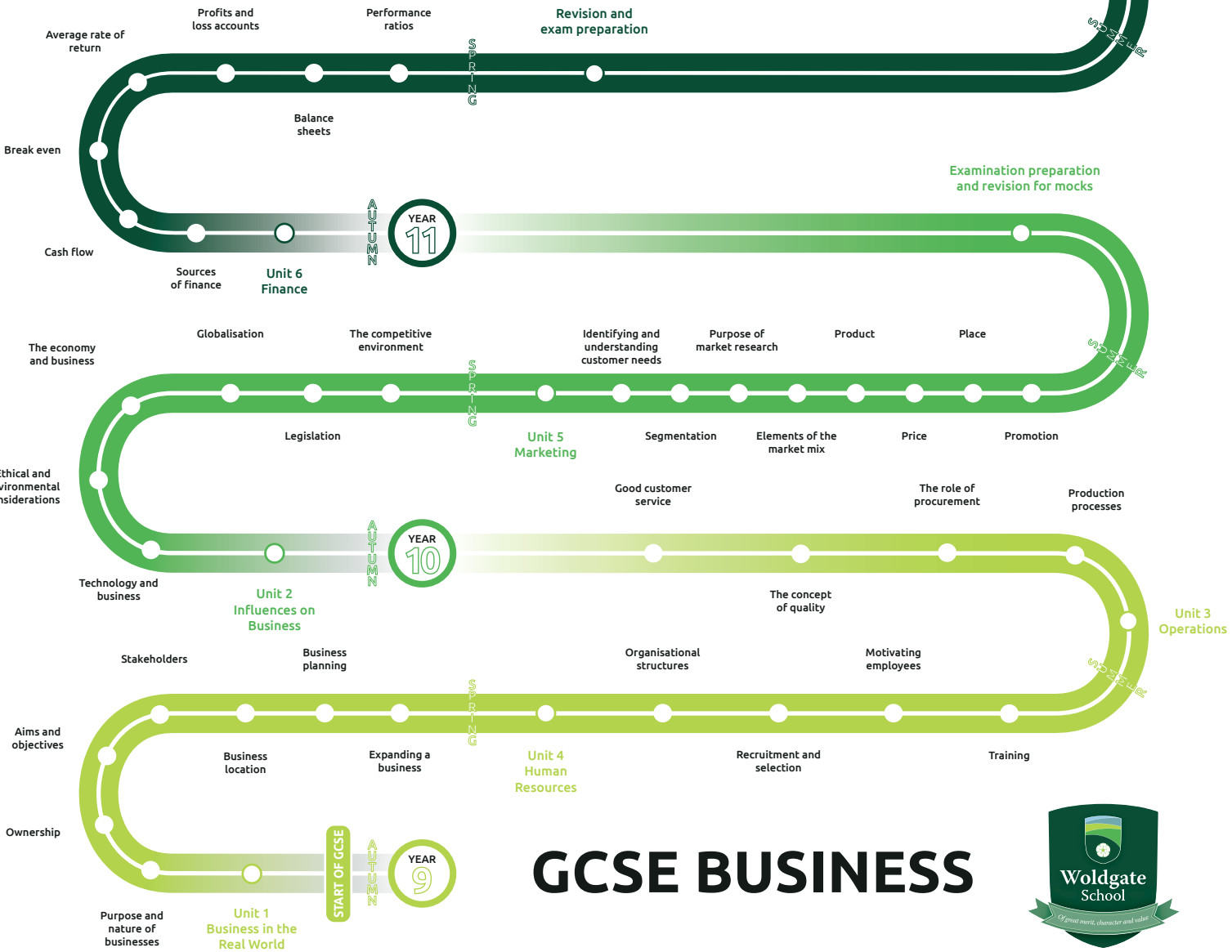


**GCSE EXAMINATIONS**

Revision and Exam Preparation

Paper 1 – Influences of operations and HRM on business activity

Paper 2 – Influences of marketing and finance on business activity



**GCSE BUSINESS**





### 3.4.1 - Organisational Structures

The organisation of a business defines how **information** is passed around the business and how **decisions** are made. In general, the more **centralised** a business is, the more **layers** there are, and the **slower** information travels, however **decisions** are made faster. The structure of a business can be shown in an **organisation chart** or **hierarchy** (like below).

A **line manager** is the “boss” of the people below them in the hierarchy. For example, the **directors** are line managers of 4 **managers** each.

**Authority** is the power people have to make decisions. **Authority** increases the higher you go up the hierarchy

**Delegation** occurs when responsibly for making decision is passed down to **subordinates** (people lower in the hierarchy). This is sometimes referred to as “giving **autonomy**” to employees.

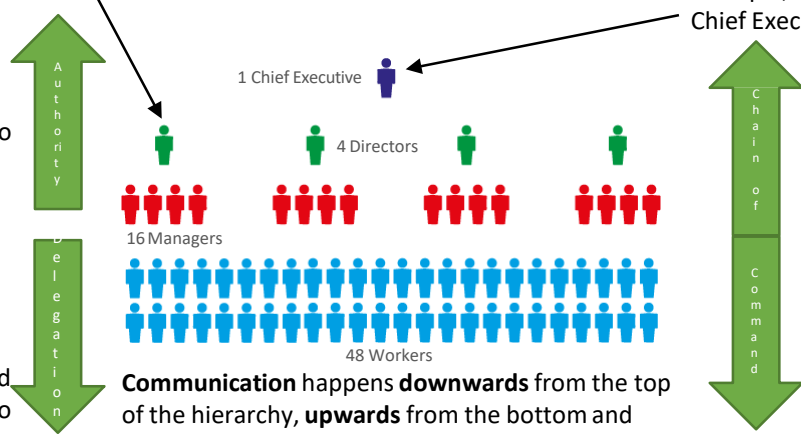
**Centralisation** is when there are **many** layers and decisions are only made by a **few people** at the top

- + Decisions are made quickly by a few people – good for emergencies
- Decisions are made far from the customer – **communication diseconomies of scale**

An **organisational structure** can be described as **tall** if there are many layers, or **flat** if there are few.

The **span of control** of an employee is the number of employees **directly managed** by that employee. For example, the span of control for this Chief Executive is **4**.

**Chain of Command** refers to how commands are passed down from people in **authority** and who they travel through, and how information is passed **up** from **subordinates** (people lower in the hierarchy).



**Communication** happens **downwards** from the top of the hierarchy, **upwards** from the bottom and **horizontally** across departments.

**De-centralisation** is the process of **removing** layers of the hierarchy to improve communication and **delegate** responsibility

- + Decisions made closer to the customer (potentially better)
- + Motivating for employees (**autonomy**)
- May be disagreements
- Low skilled employees could mean bad decisions

### 3.4.3 - Motivating employees

**Benefits of a highly-motivated workforce:**

- Higher **retention** – lower recruitment costs as fewer people leave
- Higher **productivity** – employees will be more willing to do more or better work
- Higher **levels of sales** – employees will go above and beyond to satisfy customer needs
- Easier to attract new employees – more people will want to work for the business



**Financial methods of motivation:**

- **Wages** – pay a person by the hour. Represents a **variable cost** to the business. Encourages employees to pick up extra shifts. Can also offer **overtime** – a higher hourly rate for employees who work over their contracted hours
- **Salary** – pay a person a fixed amount for a year. No set number hours for employee. Represents a **fixed cost** to a business.
- **Piecework/Piece rate** – money paid to an employee per “output” they produce: E.G per item manufactured. The business must also ensure they pay the **minimum wage**
- **Commission** – money paid to an employee when they make a sale. May be a fixed amount or a percentage of the sale amount
- **Profit sharing** – where a percentage of the profits made by a business is shared with all employees – encourages all employees to work better together

**Non-Financial methods of motivation:**

- **Job Enrichment** – giving employees more interesting or challenging tasks to do. Could also give them more autonomy (choice) in what job they do (job rotation).
- **Training** – providing good training will help employees feel they are doing their job better (job satisfaction) and feel like they are being invested in
- **Management style** – when managers show more trust in employees by allowing them to make decisions, employees are said to have more **autonomy** over their working day which can be motivational
- **Fringe benefits** are benefits given in addition to pay that come with a job. Could include: **Discounts** when buying the business’s products/services, **company car**, **health insurance**



AQA GCSE Business



## Human Resources

# Unit 4

Appears in:  
Paper 1

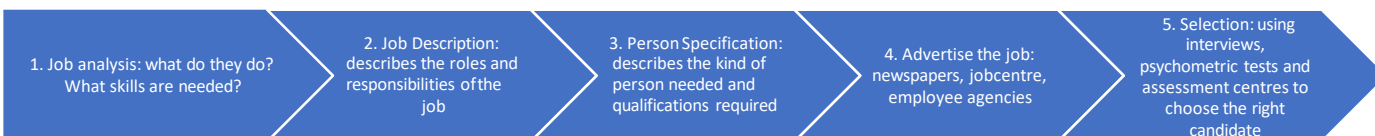
### 3.4.2 - Recruitment and selection of employees

**Internal** recruitment is when an employee is recruited from **inside** the business

- + Candidates already know the business operates
- + Offers a chance of **promotion** which **motivates** people
- + Lower cost to a business
- Cost of retraining employees for a new job
- May lead to **stagnation** or **complacency** – no new ideas

**External** recruitment is when an employee is recruited from **outside** the business

- + Recruit people with new ideas and enthusiasm
- + May be from a competitor and have insider knowledge
- + Wider choice of candidates
- + May have expensive **specialist qualifications** or **degrees**
- High costs in advertising and selection
- Candidate needs **induction training**



Employee **retention** is a measure of how long employees stay at a business. A high retention rate means lower recruitment costs, higher experience and therefore higher level of customer service and productivity.

**Selection methods:**

- **Interviews** – a face-to-face meeting with manager(s) with the applicant
- **Psychometric tests** – a questionnaire that measures personality traits to see if the applicant fits the person specification
- **Assessment Centres** – role play scenarios or a series of tasks/tests to see how the candidate approaches them

#### Full Time Contract

- Between 35 and 40 hours
- + Employee at work during normal working times -> higher productivity
- + Employees have higher experience in the job

#### Part Time Contract

- Fewer than 35 hours
- + May not require work for the whole week – saves money
- + Employee can work around another job/family

### 3.4.4 - Training

**Good training:**

- + Improves **productivity**. Employees will have more skills to do more with less time and materials
- + Improves **motivation**. Employees feel they know more about their job and therefore feel more satisfied
- + Increases employee **retention**. Fewer people leave as they feel invested in and feel they have the skills to do their job
- + Results in **higher quality** products and **higher levels of customer service**
- Costs money – some training and skills can cost money to receive. Employees may also need time off to attend.



**Induction training** is provided for new employees joining the business. Its purpose is to introduce new employees to the people they will be working with, and the procedures and policies of the business. It is also used to align the recruit with the values of the business, so they can integrate well with their new team and reduce the likelihood they will leave

**On-The-Job training** is when an experienced colleague shows you how a job is done. This is done by a combination of **observing** the colleague and doing the job with the **support** or **feedback** from the colleague. It is useful as the person being trained knows exactly how to do the job for the specific business (it may be done slightly different elsewhere) and means that the person being trained **doesn't need to take time off** for training. It can be **motivational** for an experienced colleague to show someone how to do their job, however, may cause resentment if they don't. **Doesn't result in new ideas or ways of working.**



**Off-The-Job Training** is when an employee is paid to go to training off site. This is a cost to the business as they have to **pay for the training**, **pay the employee** for being there and **lose productivity** when they are not doing their job. However, the employee can learn **brand new skills** and ideas they can bring back and improve the business. Employees can also **earn externally acknowledged qualifications**, which the business can use to charge more for their services.

Key Term	Definition
Centralisation	Maintaining control by keeping authority at the senior levels of the organisation.
Chain of command	The line through the hierarchy that shows who is responsible for whom from top to bottom of an organisation.
Commission	An amount of money paid to an employee that is based on a percentage of the sales he/she achieved; paid in addition to a basic salary.
Contracts of employment	A legal document that sets out the terms and conditions of the job for the employer and the employee.
Customer engagement	The relationship between the business and the customer that puts the customer's requirements at the centre of the operation to build brand loyalty.
Decentralisation	Where authority is spread widely through the organisation.
Delayering	The reorganisation of the organisation's employees so that there are fewer levels of management.
Delegation	Allocating a task to someone who would not normally be responsible for it.
Directors	The people who are elected by the shareholders to run the business on their behalf.
Diseconomies of scale	When a business grows too large, leading to a possible increase in unit cost.
Employees	Individuals who work full time or part time for the business; they have a contract of employment detailing their duties and rights.
Employment law	Rulings that relate to the rights and responsibilities of people who work for a business; they affect the recruitment and selection process and how the business deals with its workers.
Flat organisational structure	An organisational structure with a wide span of control and few levels of hierarchy (a short chain of command).
Fringe benefits	Additional 'perks' that are in addition to a wage/salary; they are liable to income tax.
Full time	Working all the usual hours required of an employee; usually 35 hours or more.
Hierarchy	The management structure of a business/organisation showing the levels of responsibility. It is often shown as an organisation chart.
Induction	Training given to a new employee when they start a new job; it provides information about the business, its operation and working practices.

Key Term	Definition
Job analysis	The process of determining what the job entails, including responsibilities and tasks.
Job description	A summary of what the job entails, including job title, duties and who they are responsible for/to.
Job share	A system where two employees choose to share a full time job; they receive the salary and benefits on a pro rata basis according to the proportion of the full time hours that each works.
Motivation	The reasons people are interested in and committed to their job.
Off-the-job training	Employees are trained away from their job, at a college, training provider or the business' training centre.
On-the-job training	Employees learn alongside experienced colleagues while they are doing the job.
Organisational structures	The way in which the organisation is divided into levels of management, functions and responsibilities.
Part time	Working only a proportion of the full time hours.
Person specification	Identifies the requirements of the job holder, including qualifications, experience and skills.
Recruitment	The process of hiring a new employee.
Salary	A method of paying employees for their work; based on a fixed annual amount, normally paid monthly.
Span of control	The number of people for whom a manager is directly responsible.
Staff retention	Keeping staff once they have been employed.
Styles of management	The methods used by those in leadership roles to achieve the most effective outcomes from the employees for whom they are responsible.
Tall organisational structure	An organisational structure with a narrow span of control and many levels of hierarchy (a long chain of command).
Training	Employees learn the skills and techniques needed to do the job or to prepare for a new role.
Wage	A method of paying employees for their work based on an hourly, weekly or piece of work basis, usually paid weekly or monthly.



**GCSE EXAMINATIONS**

2 GCSE Exam Papers

Revision

Search with SQL

Purpose and functionality of systems software

Programming languages

Functions of the OS

Files, fields and attributes

Sort with SQL

Operating systems

Translators and facilities of languages

Utility system software

Structured Query Language

Logic

RAM and ROM

CPU components and their functions

CPU

YEAR 11

Structured data

Truth tables

Types of storage and their suitability

Storage and memory

Hardware

Data mine

Sorting algorithms

Networks

Hardware

Transmission methods

Protocol stack

VPN

Library code

Searching algorithms

Trace tables

Types of networks, PAN, LAN, WAN

Protocols

Addressing

WiFi

Algorithms

Compression

Using Binary data

Use of data types

Data

Ascii Art

Using Hexadecimal data

Analog

YEAR 10

Data types

Negative numbers in computing

Hex

Algorithms

Producing algorithms

Chat app

Lists

Converting between number bases

Maths for Computer Science

Computational thinking

Story game

Types of error

Quiz host

Number bases – decimal binary and hexadecimal

Analysing data

The investigative cycle

Using software to visualise data sets

Sound editing

Image editing

Pixels, resolution and colour depth

Digital images

Layers of computing systems

Hardware

Operating systems

Artificial Intelligence

Introduction to Python programming

Using assignment statements

Using binary selection

Boolean variables

Locating and correcting syntax errors

Operations on strings

Representations going audiovisual

Using data

Collecting data

Modelling data using spreadsheets

Using block based programming

Mobile apps

Modifying markup

Working with multiple objects

Using variables to track counts and sums

YEAR 8

Making calculations on a spreadsheet

Spreadsheets

Developing an app

GUI elements

Programming using scratch

Paths

Manipulating shape

Media vector graphics

Credibility of sources

Networks

Wired and wireless networks

Programming using scratch

Sequence and variables

Iteration

Website building blocks

Searching the web

Word processing

Promoting a cause

Networking hardware

The internet

Programming essentials

Operators

Developing for the web

Shortcuts

Navigating the web

Using Media to gain support for a cause

Branding

Digital Media

YEAR 7

Presenting

Adding content

Getting the message across

# COMPUTING

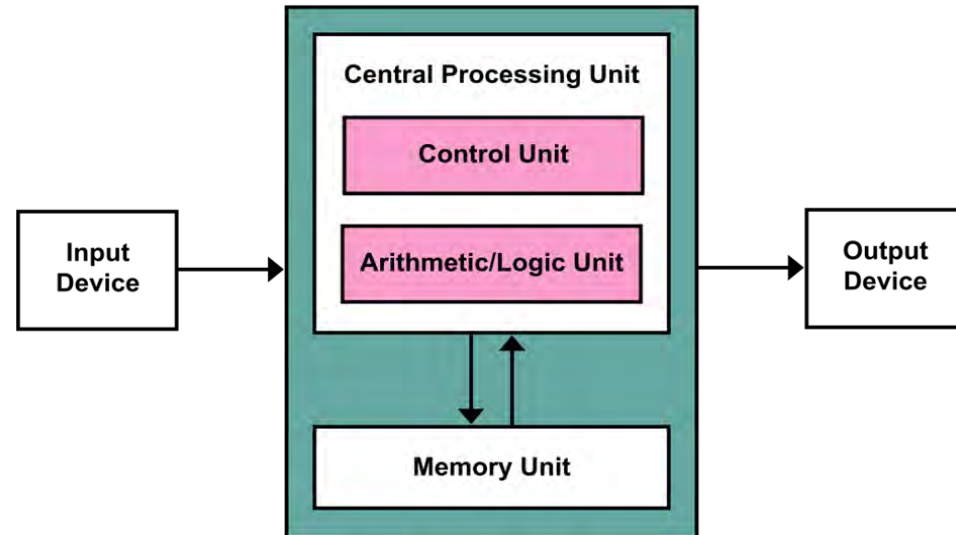




# Von Neumann Architecture

Nearly every modern computer that exists today uses the structure pioneered by von Neumann. They are made up of the following components:

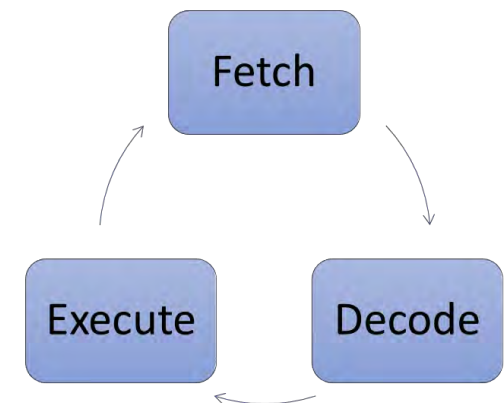
- a processing unit that contains an **arithmetic logic unit** and processor **registers**
- a **control unit** that contains an instruction register and program counter register
- memory that stores both data and instructions
- external data storage
- input and output mechanisms



## Fetch, Decode, Execute (FDE)

## CYCLE

- **FETCH** – Fetches the next instruction and associated data to be fetched from main memory
- **DECODE** – Interprets the instruction, decodes it.
- **EXECUTE** – Performs the instruction, it executes it.





# Busses

The CPU is connected to other components using a physical connection called a **bus**.

They are known as buses as they carry a number of bits of data simultaneously, in the same way that a bus carries many people at once.

There are three types of bus that connect to the components of the CPU and which connect the CPU to the rest of the computer's components.

Data bus	Carries binary data from component to component – for example an instruction from RAM that is being transferred to the CPU.
Control bus	Carries signals that control the CPU components – for example a signal to start fetching the next instruction.
Address bus	Carries the address of a memory location – for example the address of an instruction being fetched from memory.

# Main Memory

# Primary Storage

# Volatile RAM

- Random Access Memory (RAM) is volatile memory – this means that its contents are erased when its power supply is turned off.
- RAM is often referred to as ‘primary storage’, as it sits close to the CPU.
- However, it isn’t possible to keep a computer on permanently. So it is necessary to have somewhere to store the programs and data (that make a computer general purpose) when the power is switched off.
- The non-volatile storage required for this job is most often a hard disk.
- Hard disks are often referred to as ‘secondary storage’, to make them distinct from ‘primary storage’.

# Secondary Storage

# Non Volatile

There are three main types of storage technology that computers use:

- magnetic
- optical
- solid state.

There is a difference between a storage device and the medium that it uses to store information.

- A DVD drive reads from and writes data to an optical disk medium.
- A hard disk reads from and writes data to a magnetic platter medium.
- A USB drive reads from and writes data to a solid-state/flash medium.



# Colour Depth

1 bit:

2 colours (1 = white; 0 = black) –

2 bit:

4 colours (00 = white; 01 = blue;  
10 = green; 11 = yellow)

4 bits = 24 = 16 colours

16 bits = 216 = 65 536 colours.

The size, in pixels, of a bitmap image is expressed as:

image size = width × height

Construct an expression to  
Calculate the size of this image

image size = 3456 × 2592

## Calculate the file size of an image

The file size of an image is calculated by:

File size = width × height × colour depth

Bits

Pixels

Pixels

Bits

2592 pixels



3456 pixels



Every character the computer uses is recognised as binary.

Everything in a computer is binary.

Character Sets give codes in a more human-readable form for every character in a set.

ASCII = 7 bits

(128 characters)

- Enough for the standard English alphabet and a few essential system characters

Extended ASCII = 8 bits

(256 characters)

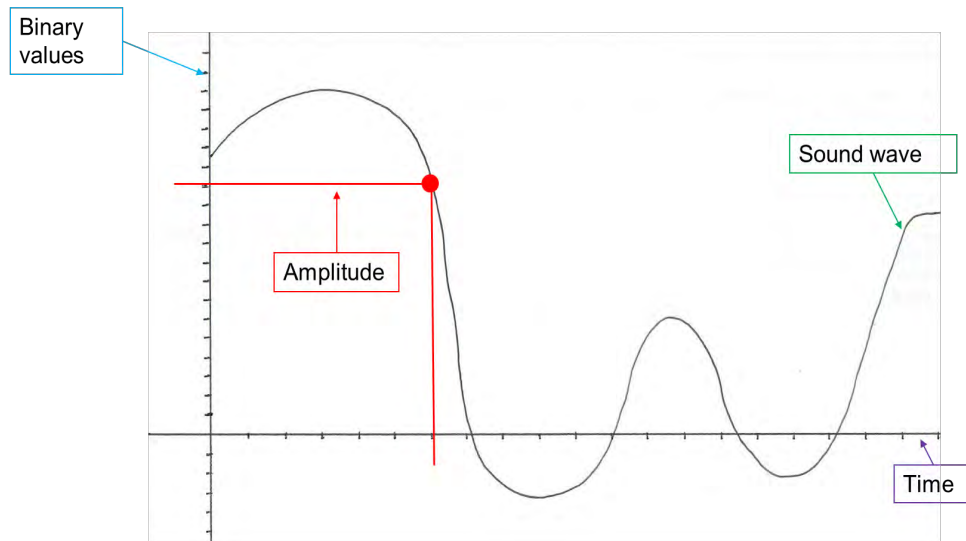
- Enough for almost all Latin-based languages, such as English

## Character Sets (ASCII and Unicode)

**Ascii Table**

<b>Dec</b>	<b>Bin</b>	<b>Hex</b>	<b>Character</b>
033	000100001	21	!
034	000100010	22	"
035	000100011	23	#
036	000100100	24	\$
037	000100101	25	%
038	000100110	26	&
039	000100111	27	'
040	000101000	28	(
041	000101001	29	)
042	000101010	2A	*
043	000101011	2B	+

# Sound



Sound wave – the whole section of the wave

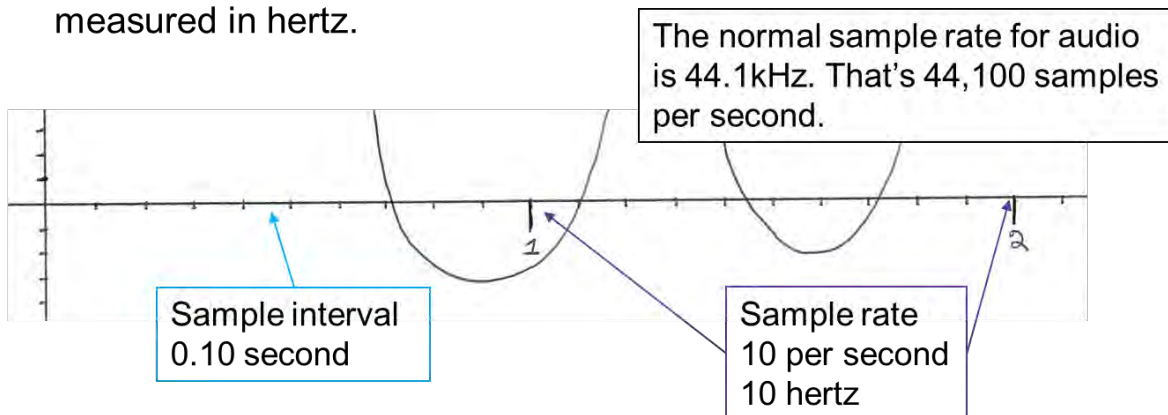
Amplitude – the value of the wave (y-axis) at a given point in time (x-axis)

Bit depth – the number of bits needed to represent the range of values on the y-axis

Y-axis – binary values

X-axis – time values.

- Sample interval - the time between samples measured in seconds
- Sample rate - the number of sound samples taken per second, measured in hertz.



## Sound—File Size

Just like image representation, we can calculate the size of an audio file based on its characteristics.

$$\text{file size} = \text{sample rate} \times \text{bit depth} \times \text{time}$$

Just like image representation, we can also calculate any one unknown if we know the other three.

Remember to use the correct units.

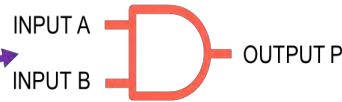
# Logic

## Programming

```
rain = True
sun = True

if rain and sun:
    print("Rainbow")
else:
    print("No Rainbow")
```

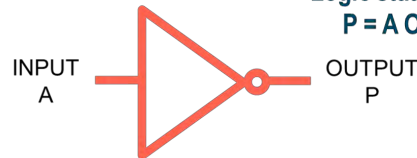
Computer circuits (logic gates)



Logic statement:  
 $P = A \text{ AND } B$



Logic statement:  
 $P = A \text{ OR } B$



Logic statement:  $P = \text{NOT } A$

# File Handling

```
file = open(fileName, mode)
```

← Any valid file name string →      ← 2-character string →

Mode First Character

r = read  
x = create  
a = append  
w = write

Mode Second Character

t = text  
b = binary

GCSE only needs text

# Compression

	Advantages	Disadvantages
Lossy	<ul style="list-style-type: none"> <li>•Bigger reduction in file size than lossless</li> <li>•Data removal not noticeable by human eyes or ears</li> </ul>	<ul style="list-style-type: none"> <li>•Removes actual data</li> <li>•Original can not be reconstructed</li> </ul>
Lossless	<ul style="list-style-type: none"> <li>•Encodes data, rather than removes it</li> <li>•Original can be reconstructed exactly</li> </ul>	<ul style="list-style-type: none"> <li>•Not as much reduction as lossy compression</li> </ul>

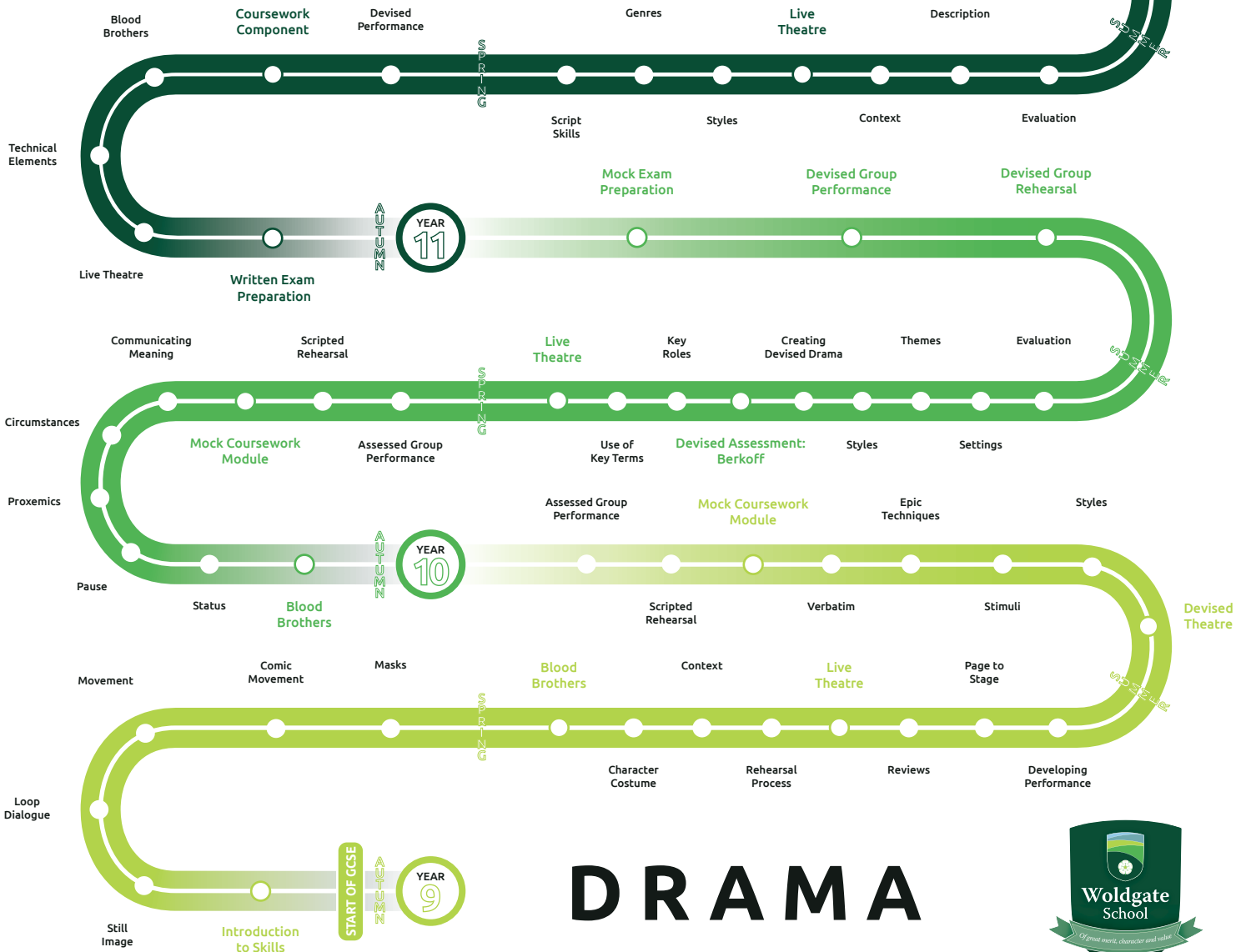




**GCSE EXAMINATIONS**

1 Written Paper

Rehearsal and Performance Exam



**DRAMA**



## ZERO FOR THE YOUNG DUDES



*"If you butcher my future, I will massacre your past"*

When the threat arrives, stay in line, follow orders, self-censor.

Survive.

We're at camp and there's revolution in the air, and rebellion on the ground.

In a world where there's no room for self expression, play by the rules.

Drill. Work. Eat. Repeat.

If they can't control the future, do they want a future?

Is it time to make a stand?

*Zero for the Young Dudes!* was first commissioned and produced by National Theatre Connections in 2017.

## MY AIMS IN THIS UNIT

To work successfully as a **performer** in the using a high level of performance **skills** and to perform in front of an **audience**.

To experience, **preparation** for a performance.

Complete the **process of developing a role**, which I will then perform.

I will **research** the play and my role, take part in workshops which explore the play practically and **participate in rehearsals** prior to performing the role in front of an audience.

Following the performance I will **reflect** and **evaluate** the performance of my role.

## DRAMA SCRIPTED KNOWLEDGE

### ORGANISER Y9

## THEMES



Young vs Old  
Revolution  
Passion  
Anger  
The impact of war

## KEY SKILLS NEEDED

- interpret a role
- participate in rehearsal
- participate in performance
- evaluate my and others performance
- access the skills previously taught in rehearsal and performance.

## ASSESSMENT CRITERIA

PERFORMANCE: 20 MARKS

QUALITY OF PERFORMANCE SKILLS 4

RANGE OF PERFORMANCE SKILLS 4

INDIVIDUAL INTERPRETATION OF A PART 4

CONTRIBUTION TO THE PERFORMANCE 4

SUCCESS OF INTENTION 4

EVALUATION: 60 MARKS

WRITING ABOUT RESEARCH AND INTEPRETATION 20

WRITING ABOUT REHEARSAL 20

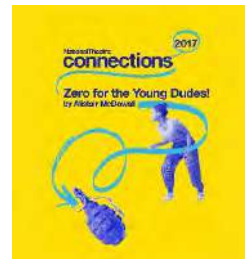
WRITING ABOUT PERFORMANCE 20

## RESEARCH

The National Theatre

Zero for the Young Dudes

Alastar McDowell



## LIGHTING, SETTING, SOUND

The set-up of lighting for a particular moment is called a state. Sound can be very *symbolic* and communicate key themes and character features to an audience. The *style* of the performance is also one of the most important influencing factors for the set designer.

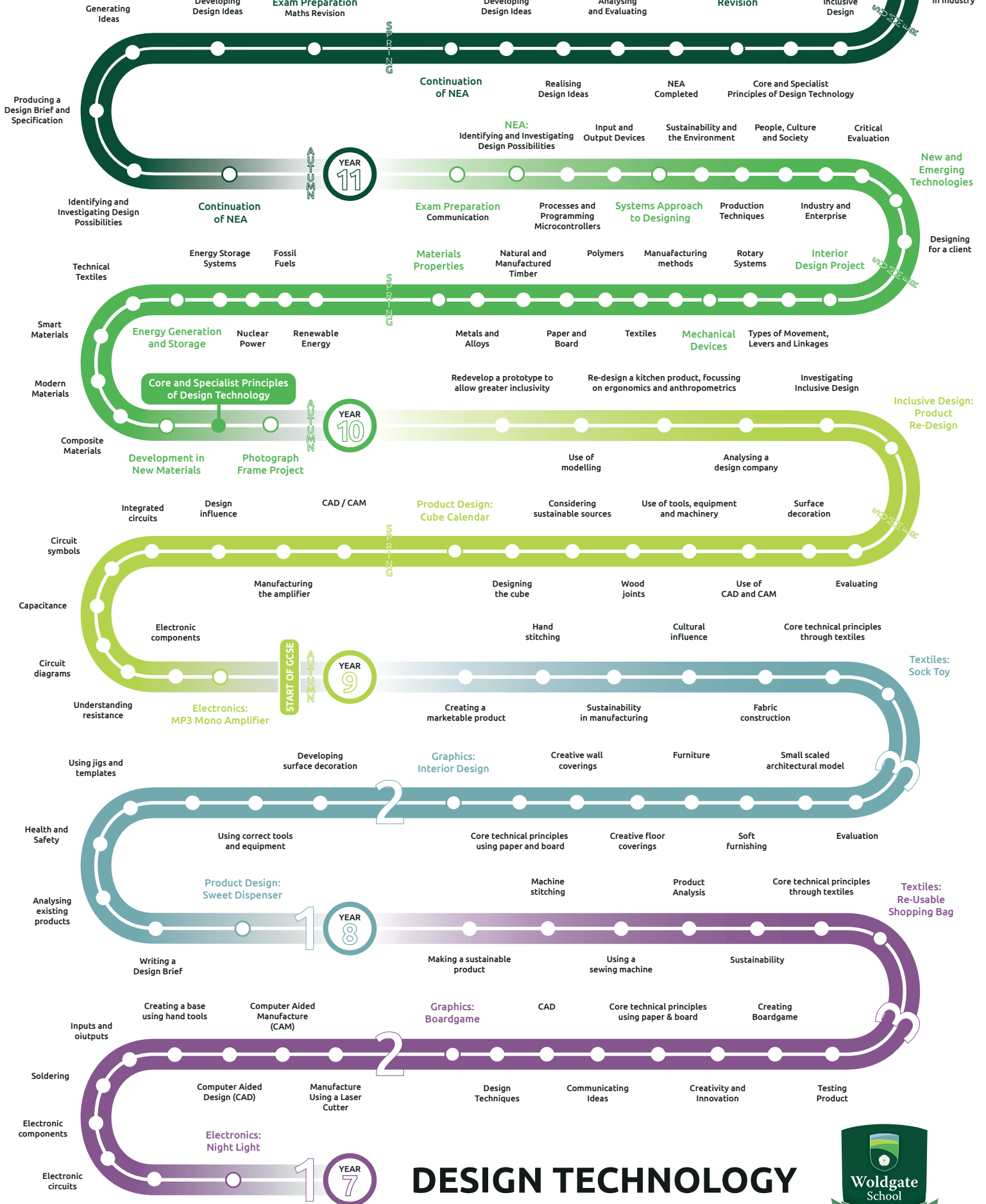


**GCSE EXAMINATIONS**

1 Written Paper

Maths Revision

Manufacturing in Industry

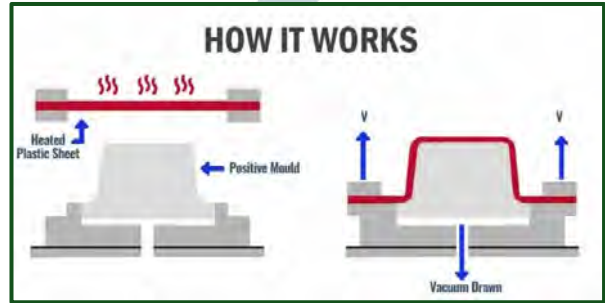


**DESIGN TECHNOLOGY**

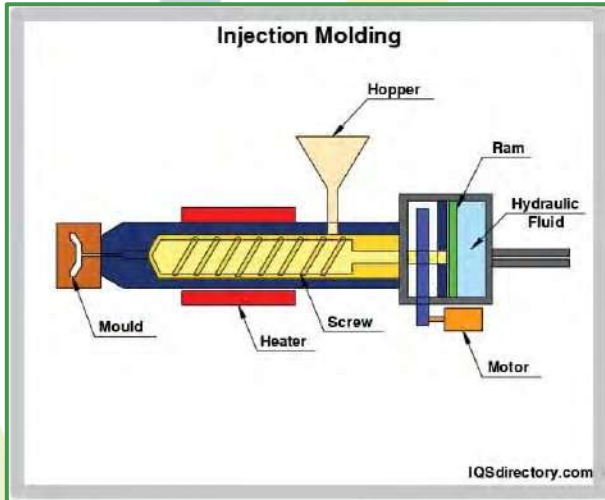




THERMOPLASTICS	THERMOSETTING PLASTICS
<p>One type of plastic known for its versatility and reusability</p> <p>Form when repeating units called monomers link into chains or branches</p> <p>Strengths: Lightweight, Low processing costs</p> <p>Low melting point: Weaken adhesive bonds</p> <p>Commonly employed for manufacturing include PE, PVC and PS used for packaging applications. Other groups are acrylics, fluoropolymers, polyesters, polyimides, and nylons.</p> <p>Thermoplastics are considered to be a favorable substitute for steel piping</p> <ul style="list-style-type: none"> <li>- Insulating electrical cable (low-pressure PE)</li> <li>- Ropes and belts (Polyamide)</li> <li>- Electrical equipment (high-pressure PE)</li> </ul> <p>Classified according to the "Resin Identification Code" (RIC) system</p>	<p>A type of plastic which cannot be remolded or recycled due to its composite chemical structure</p> <p>- Known as a thermoset</p> <p>- polymer consisting of cross-linked structure or heavily branched molecules.</p> <p>Strengths: Heat resistance, Hard and Rigid</p> <p>The compounds used in thermosets are reactive systems</p> <p>Low initial viscosity</p> <p>Unsaturated polyesters, Phenolic Resin, formaldehyde, PF, Polyurethane (PU), Urea formaldehyde, etc</p> <p>It can be used manufactured in a mold, wide range of industries such as application for automotive, appliances, electrical, lighting, and energy markets</p> <p><b>No "Recycling Identification"</b></p>



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

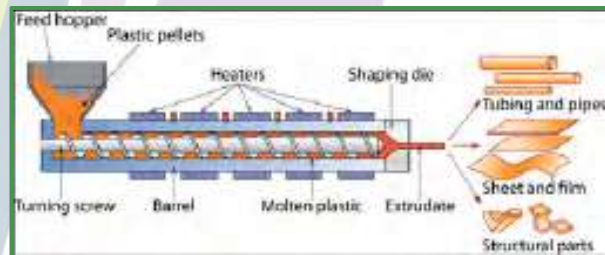
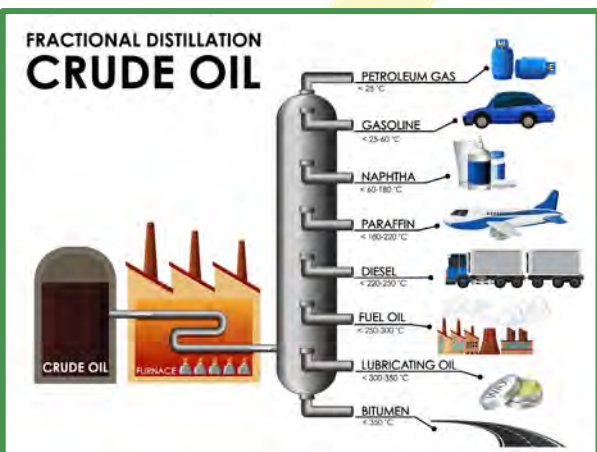


Injection moulding: common process for solid plastic objects with details. Examples are bottle tops, lego.

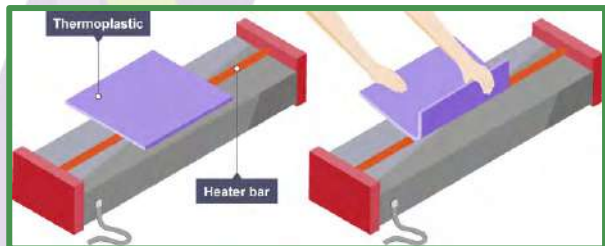
Plastics are numbered as they have different qualities and so need to be separated before recycling.

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

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



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



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



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

Tensol cement is used to join plastic to plastic.





Textiles fibres (like hairs)



Fibres are spun into yarn.



Yarn is woven or bonded into fabric.

Fabric types – their sources and characteristics:

Fabric	Source	Attribute
cotton	shrub	Lightweight and absorbent.
silk	Silkworm	Smooth, high shine, strong fabric finish.
Lambs' wool	sheep	Softness, elasticity, warmth.
cashmere	Indian cashmere goat	softness
bamboo	Grass pulp	Lightweight, pliable fibre.
jute	Vegetable plant	Strength, durability
acrylic	Crude oil / petroleum	Lightweight, warm, dries quickly.
nylon	Crude oil / petroleum	Durable, strong, lightweight, dries quickly.
polyester	Crude oil / petroleum	Durable, strong, lightweight, dries quickly.
kevlar	aramid	Very strong – hence Kevlar's use in bullet-proof vests.

### Kevlar

- Kevlar is an incredibly strong material combining plastics and resin.
- It is a very lightweight material.
- Woven to create a net like structure resistant to penetration
- Kevlar can withstand high temperatures (up to 450°C)
- Can withstand very low temperatures (up to -196°C)
- Can resist attacks from many different chemicals.
- Kevlar is often used for personal armour, such as bullet proof vests, face masks, helmets and motorcycle safety clothing.
- It can also be used in sports equipment such as bicycle frames and table tennis bats, due to its high strength-to-weight ratio.



### Fire-resistant Fabrics

These fabrics are used for items that are often exposed to flames. Such as:

- Fire-fighters uniforms
- Children's pyjamas
- Cotton furnishings

(All these items must have a flame resistant finish by law).



- NOMEX is a brand name for fire-resistant fabrics.
- It is used for the production of fire-fighters' suits
- Woolens thicken when heated to increase protection

#### Properties:

- It is lightweight
- Flame-resistant to protect the wearer from heat
- Breathable
- Durable



### Gore-Tex

- Designed to be a waterproof yet breathable textile.
- It is used to provide a waterproof product that released perspiration vapour (sweat)
- Gore-tex contains a layer of plastic with tiny holes. Each hole is too small for water droplets but big enough for sweat to pass through.

#### Commonly used:

- Waterproof jackets
- Walking boots



### Technical textiles

Technical textiles are textile materials and products that are manufactured for their technical and performance properties rather than what they look like.



### Conductive Textiles

- Fabrics that have conductive fibres woven into them
- Often called Electronic textiles or E-textiles
- Materials such as conductive thread is useful for use in circuits that power LEDs

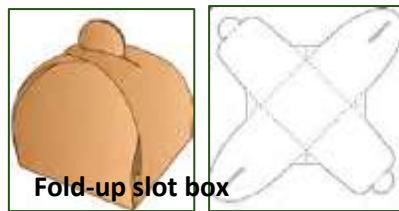
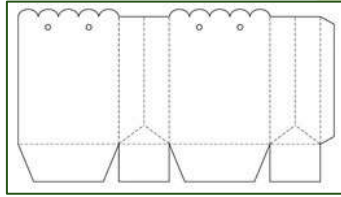


#### Example:

Conductive materials have been built into fencing jackets to help with point scoring. When the metal of their sword makes contact with the suit, a 'hit' is recorded.



Type of paper / board	Characteristics:	Applications:
Corrugated cardboard	Insulator, strong, rigid.	Pizza boxes, outer packaging
Duplex board	General packaging (low budget)	Cereal boxes, food packaging.
Solid white board	Expensive packaging	Perfume / aftershave packaging, 'Apple' products.
Foil lined board	Card with a foil layer on one side. Insulator, hygienic.	Take away containers, drink cartons.
Tracing paper	Thin, translucent, lightweight.	Tracing images to repeat or develop ideas.

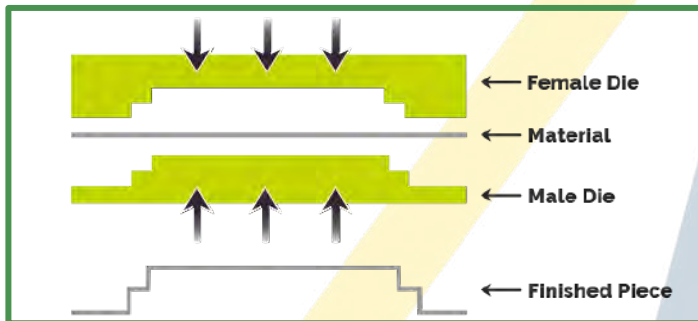


\_\_\_\_\_ = cut line  
- - - - - = fold line

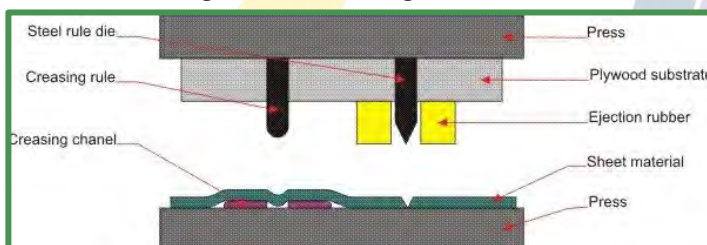
### Types of Papers

- Bleed Proof**  
Uses: High quality illustrations with colour richness
- Cartridge**  
Uses: Sketching, watercolors, ink drawings
- Grid**  
Uses: Scale Drawings, Scientific diagrams
- Layout**  
Uses: Sketching and Design work
- Tracing**  
Uses: Copying overlays and tracing drawings work

**Nets:** a net is used to create a flat plan for a 3D outcome. It will include glue tabs or assemble methods. These are **DIE CUT** in industry. Sharp blades used for cutting and rounded blades are used for creasing.



Embossing card or paper is done by pressing a male and female mould together with a design on.



Die cutting is the process used for cutting a creasing in industry. It works like a pastry cutter and stamps out designs.

### Types of board

- Corrugated Card**  
Fully degradable and recyclable. Used for packaging for impact protection.
- Duplex Board**  
Two layers of card bonded together. Used for food packaging due to bright white appearance.
- Foiled Lined Board**  
Card coated with aluminium foil on one side. Full moisture heat and freezing contents warm and a moisture barrier. Difficult to recycle as cannot separate layers. Used for takeaway containers.
- Foam Core Board**  
An inner foam core with a paper face. Used for model making and mounting artwork.
- Ink Jet Card**  
Premium card with smooth finish. Used for printing photographs and artwork.
- Solid White Board**  
High quality card, brilliant white with smooth finish. Used for greetings card, quality packaging and book covers.

CNC vinyl plotter / cutters are used to cut self-adhesive lettering or shapes for a product. It is an example of CAM.





**MODERN MATERIAL:** One which has been developed as a result of 'Technology Push'.

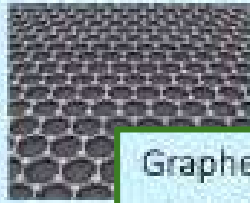
**SMART MATERIAL:** One which responds to an external input.

## Graphene

Is a single layer of carbon atoms, tightly bound in a hexagonal lattice.

Its main properties are:

1. Thinnest known material to date
2. Electroconductive
3. 200 times stronger than steel
4. Can take any shape
5. Ultra-lightweight.
6. Transparent.
7. Flexible



### Graphene uses

Used in Solar Cells, as these cells need conductive material that allows light.

Graphene is suitable due to high conductivity.

## Photochromic pigments

These pigments react to a change in temperature. A colour change can indicate that a particular temperature has been reached.

The pigments can be incorporated into a material, for example plastics, or applied to the surface as a paint.

Thermochromic pigments are quite often used in products such as babies' feeding spoons, to indicate if the food is too hot.



## Metal foam

Cellular structures made up from metal containing gas filled pores.

- Good stiffness to weight ratio
- Strong
- Resist deformation
- Good heat resistance



### Metal foam Uses

Light weight structure, compressive strength



Light weight but adds strength to critical areas. Improved safety in accidents. Less metal required.



Photochromic pigments react to UV rays and creates a colour change in the material where the pigment is located. Pigments are usually found in novelty items such as colour changing nail varnish, T shirts and vehicle spray paint etc. Photochromic particles are found in sunglasses, and will darken the clear glass when exposed to UV light.



## Corn Starch Polymers



\*Starch is a natural, organic polymer that comes from corn kernels.  
\*It's biodegradable and is used in food products, or paper production.  
\*It's renewable source.  
\*Sustainable source, makes carbon footprint less significant.

## Shape memory alloys

- Nitinol is the most common shape memory alloy. It is an alloy of nickel and titanium.
- Nitinol is used in dental braces – the heat from the wearer causes the wire to shrink slightly pulling the teeth into position.
- It can also be used in surgical stents to expand blood vessels.
- It will also respond to electrical current being passed through it – this will cause it to contract.



## Composites

### Concrete

- Concrete is a **particle composite**.
- Uses a mixture of cement, sand and stones.
- Combining these materials creates a very strong composite material.
- However, if it is to be used somewhere where it needs tensile strength, steel reinforcing is added.

Tensile strength = the maximum stress that a material can take before breaking.



## Titanium

Titanium is a versatile base metal, which is usually alloyed with other metals to enhance its properties.

It is typically used in the following ways:

- Titanium can be easily polished to a mirror finish.
- It has a high strength-to-weight ratio.
- It can be easily formed and welded.
- It is hypo-allergenic.



### Glass-fibre reinforced polymer (GRP)

- Combines strands of glass fibres which are strong but brittle with a flexible polymer
- This makes a composite material that is tough, but not brittle.
- GRP is used to make hulls for yachts and in car bodies



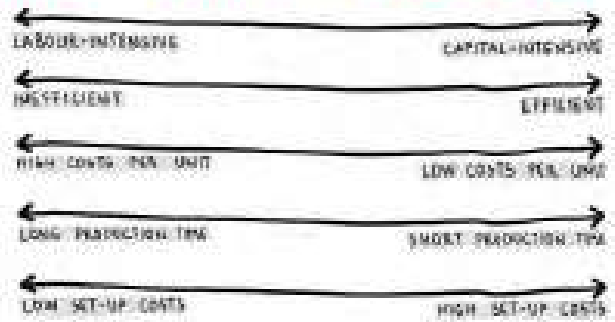
PROTOTYPES: <https://www.businessinsider.com/why-car-companies-spend-thousands-clay-models-2022-5?r=US&IR=T>

## Manufacturing

Manufacturing requires:

- Special buildings or places of work
- Organisation of people
- Organisation of tools & equipment
- Health and safety considerations
- Communication systems
- Efficient working methods

## JOB BATCH MASS / FLOW

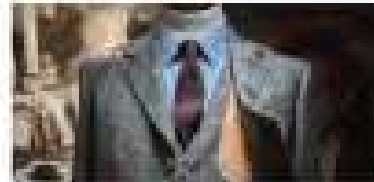


### COMPARISON OF THE THREE PRODUCTION METHODS

Criteria	Job Production	Batch Production	Mass Production
<b>Set up time</b>	Long set-up time as there is a new set up for every new job.	Can be reasonably fast as set up is usually a modification of an existing process. Otherwise as for mass production.	Very long set up as it takes time to synchronize the whole process.
<b>Cost per unit</b>	High	Medium	Low
<b>Capital (machinery)</b>	Can be flexible as it depends on specific use	A mixture of machines used, but this method is based on general purpose machines	Can involve large numbers of general purpose machines designed for a specific function
<b>Labour</b>	Highly skilled may be craft workers.	Semi-skilled and need to be flexible.	Unskilled & need medium training
<b>Production time</b>	Likely to be long	Once set up, production can be swift	Production is swift.
<b>Stock</b>	Low raw materials and finished stock, but high work in progress.	High raw materials-buffer stocks. Medium work in progress & finished stock	High raw materials & finished stock – low work in progress

## One off production

- Sometimes called custom production it is dependant upon highly skilled workers who are able to take on a number of tasks and build a product to a customer's exact needs.
- No two products will be exactly the same which is often the reason the customers are prepared to pay more.



## Just in Time manufacturing

This is where products are made to order in a timely way. Raw materials are ordered and delivered in time to make. Products are made and then dispatched just in time for them to get to the final destination.

This is only possible because of:

- + Shared information systems between manufacturer and individual component and material suppliers.
- + Excellent supplier partnerships.



## Benefits of Just in Time

- Reduced lead times between placing an order and receiving the product
- Less money is tied up in stock as every product is already ordered by a customer.
- The suppliers provide materials and components when needed. This means both raw materials and the final products do not need to be stored in warehouses, saving a significant amount of money.

## Batch production

- This involves manufacturing a number of identical products, usually by workers who take on more specialised roles.
- Manufacturing aids / jigs / moulds are usually needed although batch production typically makes use of generalised tools and equipment which can be used to make other products.



## Mass production

- This is where the number of products required is so huge that the production line needs to run day and night.
- To ensure that this can happen the whole manufacturing plant is often designed around a single product.
- Automation is vital to this type of production

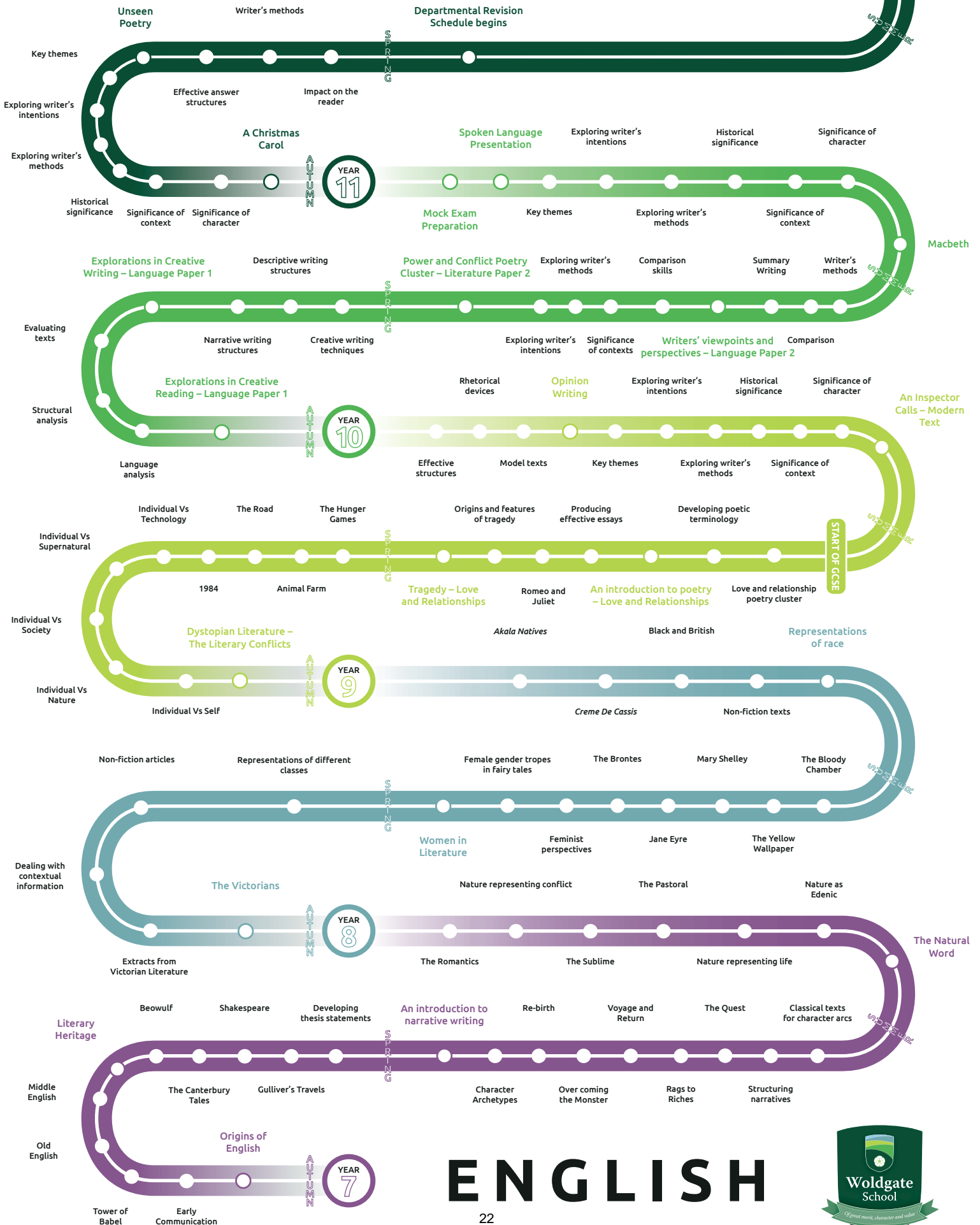




**GCSE EXAMINATIONS**

Two English Language Papers

Two English Literature Papers



**ENGLISH**



**Woldgate School: *Romeo and Juliet* knowledge organiser**

Plot				
Act One	<ul style="list-style-type: none"> <li>✓ Two wealthy families, the Montagues and the Capulets, have another brawl in the city of Verona. The Prince and the townspeople cannot cope with the constant fighting so the Prince declares that the next person to break the peace will be killed.</li> <li>✓ Romeo Montague and his friends gatecrash a Capulet party and Romeo meets Juliet Capulet.</li> </ul>			
Act Two	<ul style="list-style-type: none"> <li>✓ Romeo falls in love with her instantly. They meet again at Juliet's balcony and discover they are sworn enemies due to their feuding families. However, they agree to marry. Friar Laurence marries Romeo and Juliet.</li> </ul>			
Act Three	<ul style="list-style-type: none"> <li>✓ Romeo goes to celebrate his marriage with his friends, Mercutio and Benvolio, but gets into a fight with Juliet's cousin, Tybalt. Tybalt kills Mercutio and Romeo avenges his death by killing Tybalt.</li> <li>✓ The Prince banishes Romeo because he killed Tybalt. Both Romeo and Juliet are heartbroken.</li> </ul>			
Act Four	<ul style="list-style-type: none"> <li>✓ Capulet, Juliet's father, decides she should marry Paris. Juliet refuses and goes to Friar Laurence where they come up with a plan for Romeo and Juliet to be together.</li> <li>✓ Juliet fakes her death and lies in a tomb waiting for Romeo to come so they can run away together.</li> </ul>			
Act Five	<ul style="list-style-type: none"> <li>✓ Romeo doesn't receive the message about the plan, so thinks Juliet has actually died. He goes to Verona and sees Juliet in her tomb, 'dead'.</li> <li>✓ Romeo drinks poison so he can be with Juliet in death. She wakes up to discover Romeo is dead. Juliet kills herself with his dagger.</li> <li>✓ The Capulet and Montague families vow never to argue again.</li> </ul>			
Character summary		Killer quotations		
Romeo	<ul style="list-style-type: none"> <li>▪ a young, passionate and headstrong teenager who thinks and acts with his emotions.</li> <li>▪ his emotions are changeable</li> <li>▪</li> </ul>	<p>"Did my heart love till now? Forswear it, sight! For I ne'er saw true beauty till this night."</p> <p>"O she doth teach the torches to burn bright!"</p>	<p>"Like a rich jewel in an Ethiop's ear,"</p> <p>"My lips, two blushing pilgrims, ready stand"</p> <p>"Juliet is the sun"</p>	<p>"By heaven, I love thee better than myself;"</p>
Juliet	<ul style="list-style-type: none"> <li>▪ a young and innocent teenage girl, but she is also decisive, passionate and headstrong.</li> <li>▪ When Romeo is banished for killing her cousin Tybalt, she is devastated. She feels very confused but knowing how she feels for Romeo, she forgives him.</li> </ul>	<p>"Saints do not move, though grant for prayers' sake."</p>	<p>"Yet if thou swearest, Thou mayst prove false"</p>	<p>"<b>O happy dagger,</b> This is thy sheath; there rust, and let me die."</p>
Mercutio	<ul style="list-style-type: none"> <li>▪ Mercutio is Romeo's best friend. Mercutio likes to have a good laugh, is optimistic, loyal and a good friend.</li> </ul>	<p>"ask for me to-morrow, and you shall find me a grave man."</p>	<p>"Why the devil came you between us?"</p>	<p>"A plague o' both your houses"</p>



**Woldgate School: *Romeo and Juliet* knowledge organiser**

<b>Tybalt</b>	<ul style="list-style-type: none"> <li>Juliet's cousin. He is extremely feisty and enjoys the conflict between the Montagues and his family. He is strong-willed, argumentative, passionate and loyal.</li> </ul>	<p>"It fits when such a villain is a guest. I'll not endure him"</p>	<p>"but this intrusion shall Now seeming sweet convert to bitter gall."</p>	
<b>Lord Capul</b>	<ul style="list-style-type: none"> <li>Juliet's father</li> <li>Has arranged her marriage to Paris</li> <li>Is controlling, powerful and passionate</li> </ul>	<p>"Go to, go to; You are a saucy boy" "He shall be endured:"</p>	<p>"Out, you baggage, You tallow-face! ..." "Hang thee, young baggage. Disobedient wretch!"</p>	<p>"Speak not, reply not, do not answer me. My fingers itch."</p>
<b>Paris</b>	<ul style="list-style-type: none"> <li>A wealthy gentleman who has arranged his marriage to Juliet via her father</li> </ul>	<p>"This is that banish'd haughty Montague, That murder'd my love's cousin, with which grief, It is supposed, the fair creature died;"</p>	<p>"Condemned villain, I do apprehend thee: Obey, and go with me; for thou must die."</p>	

Key terms/concepts		How to answer an essay question
<p>In Literature, <b>context</b> means placing the text you are studying in the 'bigger picture'. You should ask yourself consider:</p> <ol style="list-style-type: none"> <li>When the text was written</li> <li>What the society was like at the time the text was written</li> <li>What or who influenced the writer</li> <li>What political or social influences there would have been</li> <li>What influences there may have been in the genre that may have affected the writer</li> <li>When the text was written and when it was set may also have an important part to play in what is written</li> <li>The context hinted at by the examination question</li> </ol>	<p>Dramatic Irony Foreshadowing Imagery Antithesis Sonnet Metaphor Simile Alliteration</p> <p>Revenge Courtly love Justice pride callousness</p>	<ol style="list-style-type: none"> <li>Chronological approach - identify the topic word in the question and track that idea in time order through the play</li> <li>Noticing approach - annotate the extract with how Shakespeare presents the theme in the question. Then make links to other parts of the play.</li> </ol>
<p>Elizabethan England: Gender roles during the patriarchal Elizabethan society were clearly defined, with men holding significant power over women. A woman at this time had few legal rights, less chance of an education and very little control over her own life.</p> <p>Women were considered to be 'weak' and were expected to be submissive, demure and obedient. All throughout their life, the women of the Elizabethan times were made to become dependent on a male relative - a father or a husband for example.</p>		<p style="text-align: center;"><b>Introduction and premise</b></p> <p><b>Sentence 1:</b> Define the key word in the question. Personalise it - what does it mean to you? Contextualise it based on the text you're writing about.</p> <p><b>Sentence 2:</b> Identify a question based on what the author wants us to think of the key theme/character named in the exam question.</p>

**Woldgate School: *Romeo and Juliet* knowledge organiser**

The Globe Theatre: There would be approximately 2, 500 people at each Shakespeare performance. It had a thatched roof around the outside but was open in the middle to allow light in for the plays. Shakespeare owned 12.5% of the theatre as his acting company, The Lord Chamberlain's Men, clubbed together to pay for the land and the building. Shakespeare owned 12.5% of the theatre as his acting company, The Lord Chamberlain's Men, clubbed together to pay for the land and the building.

**Model: "How does Shakespeare present the theme of revenge in the play?"**

**Sentence 1:** Revenge is seeking something in return for someone's wrong against you. In *Romeo and Juliet*, the feuding families seek revenge on each other.

**Sentence 2:** Shakespeare perhaps uses this theme so that the audience question what is revenge and what is justice. Are the families punished for seeking revenge for 'an airy word'?