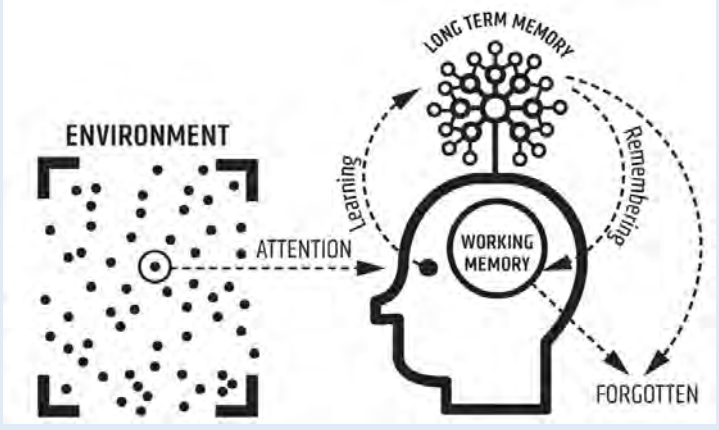
Knowledge Organiser Booklet Year 10 Term 2 Non Core

Our working memories can only store a limited amount of information, whereas our long term memories can store limitless information. To learn successfully, we need to store core knowledge into our long term memories, so we can retrieve it when we need it.

For instance, if you are at work or in the shops and need to work out a 25% discount, you can't memorise 25% of every number, so you need to be able to quickly recall the method for calculating a percentage. Committing core knowledge to our long-term memories is a life-hack. It makes thinking about difficult things easier.

Using a knowledge organiser with regular retrieval activities is a way for you to store core knowledge & subject specific words, into your long term memory so it is there when you need it.

Click here to be taken to the knowledge organiser part of the school website.



Contents

Clicking on the subjects below will take you directly to the knowledge organisers for each subject. These are to support learning that has taken place this past term. Use these to help reinforce the key knowledge. Use some of the strategies explained in the introduction to help you retain this important information.

Blended Learning Expectations

Make sure you have **access to a computer at home** (If you don't please make pastoral staff aware or email langley.homelearning@taw.org.uk)

Download Microsoft Teams on both your phone and computer. (If you don't know how to do this please ask a member of staff or do this in your next computing lesson)

Spend at least 2 hours a week using teams EVERY WEEK. (Engagement in teams can be tracked and monitored). You need to be accessing each of your class teams and recapping on the previous learning or completing additional tasks set by your class teacher.

If you have any issues with teams (e.g. login problems or missing classes etc then please email langley.homelearning@taw.org.uk)

Teams is a tool to support ongoing learning and should **only be used for educational purposes.**

How to complete homework your teacher has set

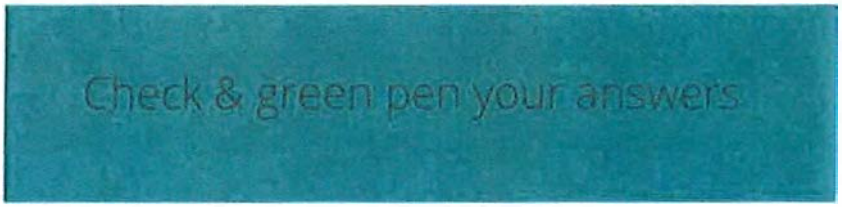
	LOOK, COVER, WRITE, CHECK	DEFINITIONS TO KEY WORDS	FLASHCARDS	DUAL CODING
STAGE 1	Look at & study an area of your knowledge organiser 	Write down the key words & definitions 	Write key words, dates/formulae, equations/quotes on one side & answers on the other	Draw pictures/diagrams/ cartoon strips 
STAGE 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. Repear. 

Retrieval Placemat

Look at your knowledge organiser. Now cover it up and write down Key vocabulary & definitons from memory:

First time: Look. Cover. State 3 facts	Second time: Look. Cover. State 3 facts	Third time: Look. Cover. State 3 facts



Look at the knowledge organiser again. Now cover it up and without looking, explain a concept or idea in your own words

Re-read your answer above. Look at the knowledge organiser again. Now cover it up and improve on your previous explanation in green pen.

Retrieval Relay

Look at your knowledge organiser. Now cover it up.

First time: Write down everything you can remember

Second time: Look. Cover. Write down everything you can remember

Third time: Look. Cover. Write down everything you can remember

Write down everything here that you didn't remember:

Vocabulary focus 1

Look at your knowledge organiser. Select a key word and write it here:

Write a definition of the key word in your own words - not the same as the one on the knowledge organiser:

Write a sentence with the key word in it:

Create a question where the key word is the answer:

What other words are connected to this key word?

Draw a picture or diagram to help you remember this key word:

Vocabulary focus 2

Definition:

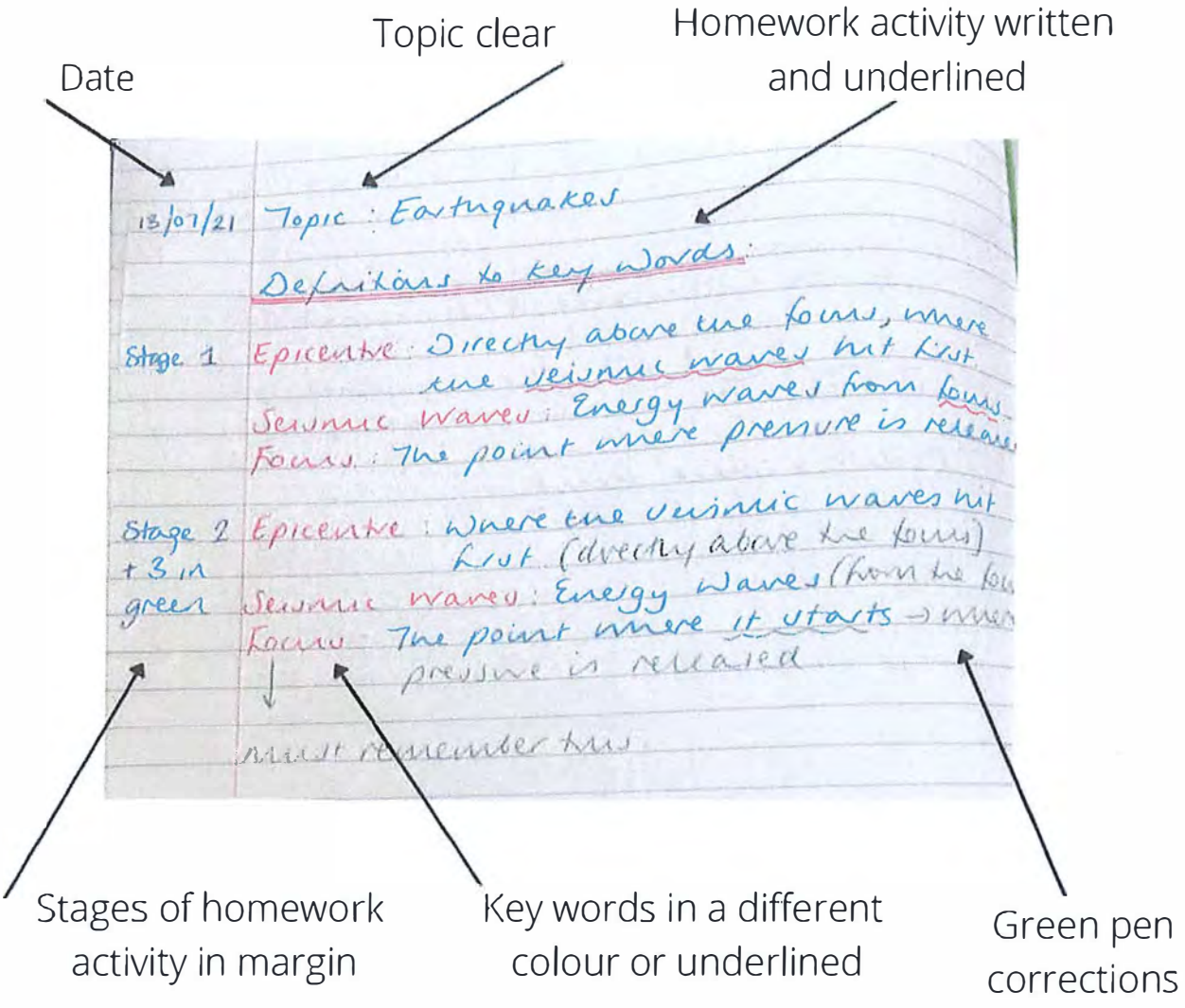
Characteristics:

Key word:

Examples:

Non-examples:

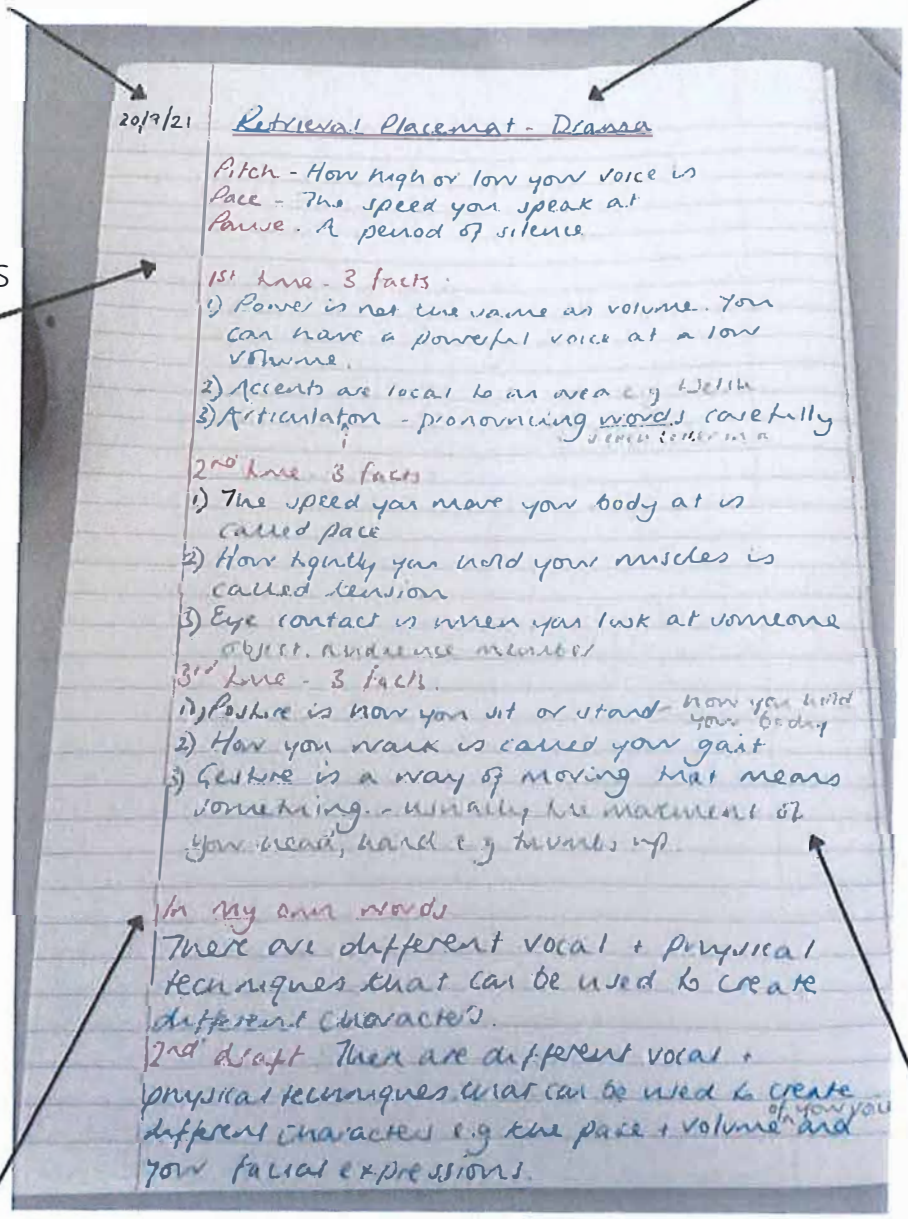
What should my knowledge organiser homework look like?



What should my knowledge organiser homework look like?

Homework activity written and underlined

Date

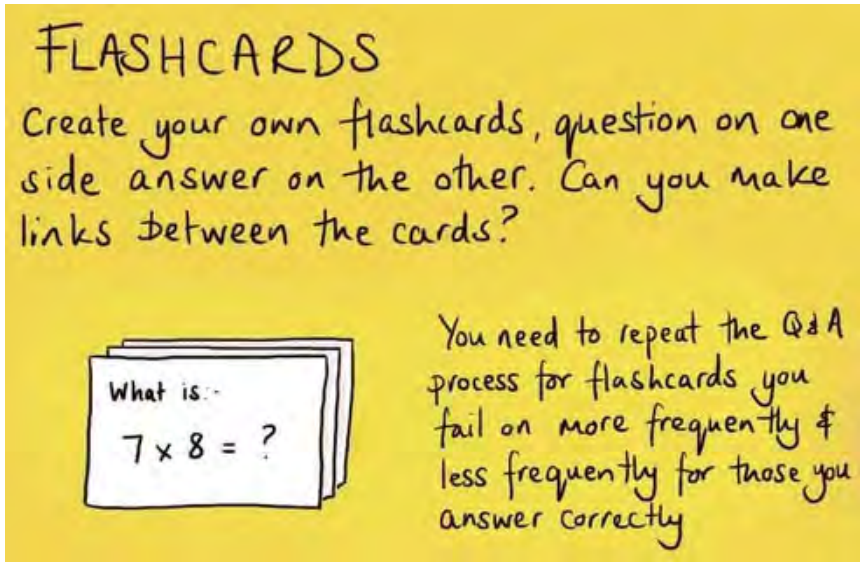


Key words in a different colour

Green pen corrections

Stages of homework activity as subtitles

Art & Design



Create a flash card with all the key facts you want to learn (this can be drawn in your book). On the next page try writing down as many facts or as much of the knowledge as you can. If you find you are getting certain facts wrong then these are where you need to focus and relearn.

Year 10: Unit 3

Unit 3

Threshold Concept (TC1) - Understand the elements of art and how these can be used to create a piece of artwork.
Threshold Concept (TC14) - Understand how symmetry, simple geometric shapes, measuring techniques and the grid method can help with accuracy when drawing.
Threshold Concept (TC51) - Understand how to create a range of tonal values with pencil.

Bronze

… remember the seven elements of art.
… understand how to draw simple geometric shapes to help plan a drawing.
… understand simple drawing techniques to help plan a drawing.
… understand the techniques of using graphite to create a range of tonal values.

Formal Elements of Art

Colour – what you see when light reflects off something.
Line – a mark made which can be long, short, scribbled, straight etc.
Shape – a 2D area which is enclosed by a line.
Form – a shape which has 3 dimensions.
Tone – how light or dark something is.
Texture – how something looks or feels (visual or actual) rough etc.
Pattern – a symbol or shape that can be random or repeated.

SCAN ME

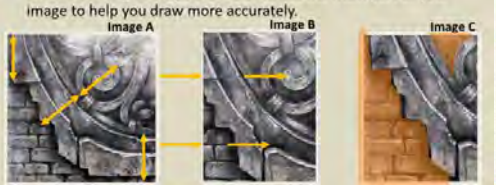
Rule of Thirds

Pencils come in different grades,
the softer the pencil, the darker the tone.
H = Hard B = Black
The most useful pencils for shading are 2B and 4B.
If your pencil has no grade it is most likely HB which is 'hard black'.

Year 9 Previous Learning

Technique 1: Drawing freehand

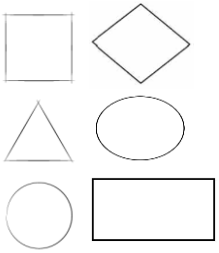
- When **starting to draw**, begin with **basic shapes** and draw them **very very softly.**
- Use **measuring techniques**, i.e. compare the size of one part against another to get the proportions of your drawing correct. Image A is a square!
- **Compare heights of different parts.** (Which parts are at the same level?)
- Look at the **negative space** in and around the main part of your image to help you draw more accurately.



SCAN ME

Measuring with a pencil

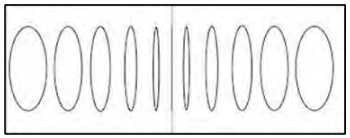
Basic **Shapes**



Working out the measurements and drawing the outline first is crucial before adding tone and texture. If drawn softly, the outline can then be gradually erased or built up using tonal values.

Draw edges not outlines!

Ellipses



Mark making

To make drawings look more realistic, try to use different marks to show textures and surfaces. You can do this by changing the direction, pressure and length of your marks.

Grid Method

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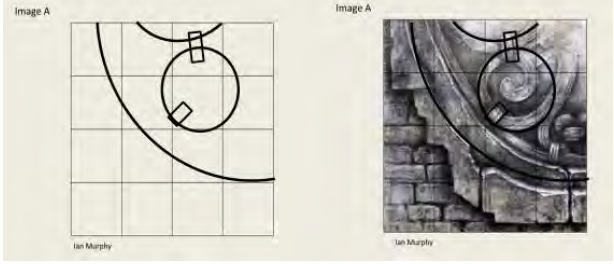
Year 9 Previous Learning

Task:

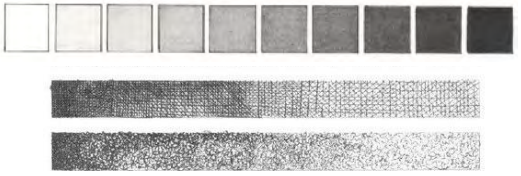
Technique 2: The grid method

- **Start to sketch the basic shapes** from your image.
- Have **reference points** that you can refer to.
  You can then check that you have things in the correct square.
  Look at where the image crosses over the grid lines.



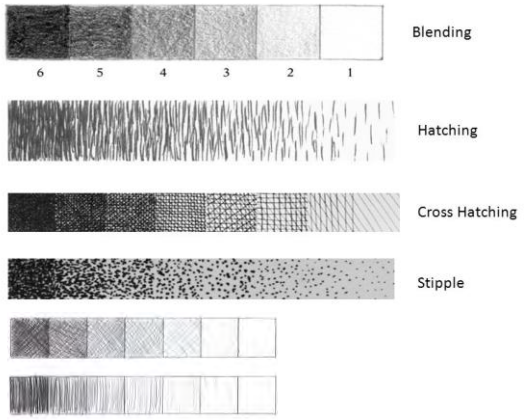
Texture

Visual texture is accomplished by carefully using a combination of tonal shading and the different shading techniques.



A tonal drawing does not need colour to be added.

Keywords
Grid method,
Basic shapes,
Rule of Thirds,
Graphite,
Formal elements
Tonal scale,
Hatching
Cross hatching,
Ellipse,
Symmetrical
Mark making,
Geometric shapes,
Parallel,



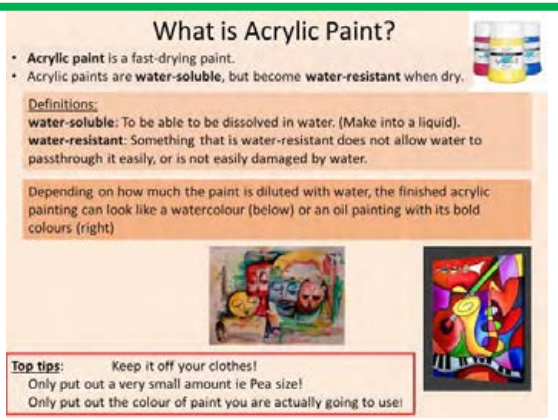
Year 10: Unit 4

Unit 4
Portrait
Threshold Concept (TC52) - Understand different acrylic paint techniques.
Lino Print
Threshold Concept (TC53) - Understand the process of lino printing.
Threshold Concept (TC54) - Understand how to produce a lino print with many colours.

Transfer: to move someone or something from one place to another:

Formal Elements of Art
Colour, Line, Shape
Form, Tone,
Texture, Pattern

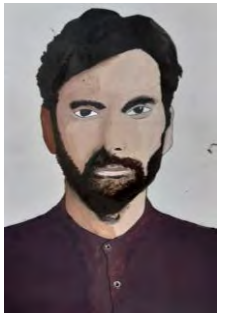
Bronze
Portrait
… understand how to trace and simplify an image.
… understand what 'transfer' means
… understand what 'acrylic paint' is.
Lino Print
… understand what 'Lino printing' is.
… understand how to cut a lino safely.
… demonstrate how to produce a uniform lino print.



SCAN ME

Acrylic Paint Techniques


David Tennant


Acrylic painting

Always carve into the lino pointing **away from your free hand.**

When clearing the lino after carving into it, put the **lino cutter down safely away from the lino you are working on.**

Always use a lino cutter with care.

Lino printing is a printmaking technique that goes back to the early 20th century.

It's an effective method for creating multiple prints of an artistic piece using lino.

Other printmaking techniques, such as etching and lithographs, use a similar technique.

In the same way as a painting, each linocut print that is produced, is an handmade original artwork - it's has not been mass produced. An artist has used their time and skill to design, carve, ink and carefully press onto paper the finished piece of artwork.

1 Your design is traced and transferred onto the lino. It is then carved into the lino with care.

SCAN ME

Colour Theory

2 The chosen colour of printing ink is rolled out onto acrylic glass only to get an even coverage on the roller, not to cover the area of the acrylic glass. 2 colours can also be mixed this way.

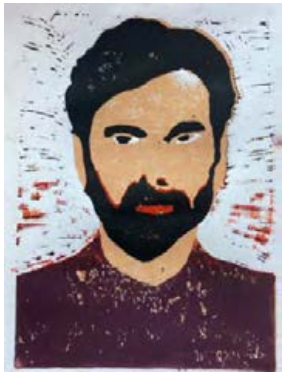
3 Once you have an even coverage of ink on the roller, you can roll it over the lino. The ink will stick to the peaks of lino but not go into the areas that have been carved out.

4 Put paper over the lino and use a roller to apply pressure so that the inked areas touch the paper.

Reductive Lino Printing Technique

SCAN ME

Always remember that the image will be reversed when you print, including any lettering in your design.


Lino print

Year 10: Unit 4

Unit 4
Clay Work
Threshold Concept (TC24) - Many artists over the years have used clay as a material to produce their artwork.
Threshold Concept (TC25) - Understand that ideas can be developed from primary and/or secondary sources.
Threshold Concept (TC26) - Understand the different stages of clay.
Threshold Concept (TC27) - Understand basic clay techniques.


Antoni Gaudi

Keywords
Composition, Technique, Slip, Plastic, Leather hard, Bisqueware,

Formal Elements of Art
Colour, Line, Shape, Form, Tone, Texture Pattern

Clay Work
… understand what 'ceramic' means.
… understand that clay can be used as a medium for artwork.
… understand how to make simple shapes using clay.
… select appropriate colours for the clay work.

SCAN ME
The six stages of clay

Ceramic means that the item is made of clay and it is permanently hardened by heat.


Natalie Blake


Chris Gryder


Rachel Dein

Artists who have used clay as a material to produce their artwork.



Yr11 Sealife project where clay was used as a material to produce artwork from a secondary source.


Score, slip and blend

SCAN ME
Clay Techniques: Slip, Score And Blend

Claywork produced from a primary source



Plastic


Tile work

SCAN ME
Modelling Simple Shapes

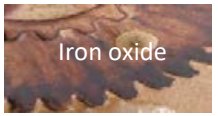
Glazes

White glaze

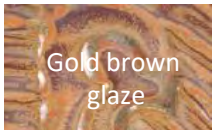

Fire engine red glaze

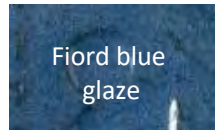
Butter yellow glaze


Tivoli red glaze


Iron oxide


Sea green glaze


Gold brown glaze


Fiord blue glaze

Computer Science

Sorting Algorithms

Bubble Sort

- The purpose of sorting algorithms is to order an unordered list. Item can be ordered alphabetically or by number.
- Bubble sort steps through a list and compares pairs of adjacent numbers. The numbers are swapped if they are in the wrong order. For an ascending list if the left number is bigger than the right number the items are swapped otherwise the numbers are not swapped.
- The algorithm repeatedly passes through the list until no more swaps are needed.

Example

Sort the following sequence in ascending order using bubble sort: 5,3,4,1,2.

Pass 1	**5**	**3**	**4**	**1**	**2**	
	3	5	4	1	2	Compare 5 and 3 – swap
	3	4	5	1	2	Compare 5 and 4 – swap
	3	4	1	5	2	Compare 5 and 1 – swap
	3	4	1	2	5	Compare 5 and 2 – swap; end of pass 1
Pass 2	3	4	1	2	5	Compare 3 and 4 – no swap
	3	1	4	2	5	Compare 4 and 1 – swap
	3	1	2	4	5	Compare 4 and 2 – swap
	3	1	2	4	5	Compare 4 and 5 – no swap; end of pass 2
Pass 3	1	3	2	4	5	Compare 3 and 1 – swap
	1	2	3	4	5	Compare 3 and 2 – swap
	1	2	3	4	5	Compare 3 and 4 – no swap
	1	2	3	4	5	Compare 4 and 5 – no swap; end of pass 3
	1	**2**	**3**	**4**	**5**	

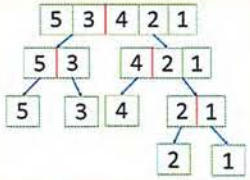
Bubble sort Pseudocode

```
A=[5,3,4,1,2]
sorted ← False
WHILE not sorted
 sorted ← True
 FOR I TO LEN(A)-1:
  IF A[i] > A[i+1]:
   temp ← A[i]
   A[i] ← A[i+1]
   A[i+1] ← temp
   sorted ← False
  ENDIF
 ENDFOR
ENDWHILE
OUTPUT A
```

Merge Sort

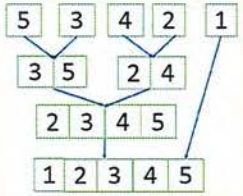
- Merge sort is a type of divide and conquer algorithm.
- There are two steps: divide and combine
- Merge sort works by dividing the unsorted list sublists. It keeps on doing this until there is 1 item in each list.
- Pairs of sublists are combined into an ordered list containing all items in the two sublists. The algorithm keeps going until there is only 1 ordered list remaining.
- Merge sort is a recursive function, that calls itself.

Step 1: Divide



Keep dividing until there is only 1 item in each list

Step2: Combine



1. The first items in the two sublists are compared, and the smallest value is copied to the parent list.
2. The copied item is then removed from the sublist.
3. When there are no items left in one of the sublists the remaining items in the other sublist are them copied in order to the parent list.

Merge sort Versus Bubble sort

	Advantages	Disadvantages
Bubble sort	Very simple and robust algorithm	Can be slow particularly for long lists. As the number of items increases the time taken for the algorithm to run increases dramatically.
Merge sort	Much faster than bubble sort especially when the number of elements is large	More complex to understand Step 1: Divide Step 2: Combine

Computer Systems

A computer system has both hardware and software.

Hardware are the physical components that make up a device or computer system. These include both the internal components (eg motherboard, CPU, RAM) and peripheral devices such as printers.

Software is the computer code, programs and algorithms that give instructions to the hardware to make it perform the desired task. Without the software the hardware will not get any instructions and it will not do anything.

Software Classification

Software is split into two types: application software and system software

Application software is a program designed to perform a specific task that the user interacts directly with (eg spreadsheets, web browser and word processor, disk defragmentation).

System software is concerned with the running of the computer. Its purpose is the control the computer hardware and manage the application software. (eg operating system, antivirus, backup tools, firewall)

The **operating system (OS)** is the most important piece of system software. The OS handles management of the processor, memory, input/output devices, applications and security.

- **Application management** - Application software does not need to concern itself with interaction and complexities of managing the hardware because this is dealt with by the operating system. Application software runs on top of operating system which is an intermediary and takes care of interaction with the hardware.

- **Processor resources** – Allows multiple applications to be run simultaneously by manages the processing time between applications and cores and switching processing between applications very quickly. Multiple applications will access the processor resources via a schedule that alternates process between applications. High priority applications will have more CPU time, but it means that lower priority applications will take longer to run.

- **Memory management** – Distributes memory resources between programs and manages transfer of data and instruction code in and out of memory. Ensures that each application does not use excessive memory.

- **Security** – Tools such as anti-virus software and firewalls help protect the computer from attack. In addition requirement for passwords and control of access rights

- **Input / Output devices** – OS controls interaction with input (eg keyboard) outputs (eg. Monitor) and storage (eg hard disk) using hardware drivers. Allows users to save files to the hard disk and print documents for instance.

Cloud Computing

- Can store data and files on a server elsewhere that can be accesses via the internet.
- Can use applications over the internet
- Can sync files so that all your devices see the same files
- Can share documents with others
- Can access your files anywhere if you have a good internet connection

Advantages of cloud computing
- Only pay for storage that you use
- Data and files available from anywhere in the world where there is an internet connection
- Data automatically backed up

Disadvantages of cloud computing
- Need a reliable network connection
- Files are hosted elsewhere so a security concern
- the most recent versions of software is often not available
- Transfer of data over the internet will slow down performance.

Advantages of local storage
- Files can be accessed even when there is no internet connection
- More secure as files to not need to be transferred over the network and the user has more control

Disadvantages of local storage
- Users need to organise their backup solutions
- Not so easy to share documents
- Can only access the files locally

Memory

Volatile memory (main memory) When the computer is turned off the contents of volatile memory is lost. When there is no power, volatile memory is erased.

Non-volatile memory (secondary storage) Even when here is no power, the data remain unchanged and can be accessed once again once power has been resumed. This allows you to store files for he long term.

ROM (Read Only Memory) Data can only be read from the device, and cannot the memory cannot be edited or deleted. ROM is only used for situations where you can be sure that updates will not be needed. The computer's BIOS (basic input output system) which controls the boot up sequence is stored on a ROM chip.

RAM (Random Access Memory) - When applications are executed they are loaded into RAM first. RAM is volatile.

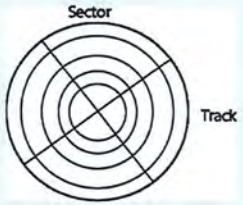
Embedded Systems

An embedded system is a computer system that is designed for a specific function, in contrast to a general-purpose computer that can carry out many tasks. Embedded systems typically have a minimal or no user interface. Thus, they can be optimised for size and power consumption, for instance. Examples of embedded systems include digital watches, MP3 players, washing machines, cars and mobile phones.

Secondary Storage

Secondary storage is necessary for saving files long and software including the operating system. Even when the computer is turned off, the data remain unchanged, and can be accessed again once the power supply has been turned on.

Magnetic Hard Disk
- Tracks on the disk platters contain tiny magnets, each holding 1 bit of data.
- The polarity (negative or positive) of the magnets determines whether the bits are 0 or 1.
- The write head modifies the polarity of the magnet as appropriate.
- The read head identifies whether each magnet is negative or positive.
- The tracks are laid out as a series of concentric rings.



Advantages
- Cheap form of storage

Disadvantages
- Less reliable because it contains moving parts that can break
- Electromagnetic surge can corrupt the data held
- Slow speed of read/write access

Optical Disks

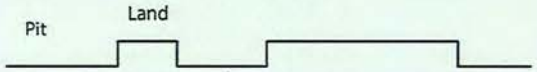
- Tracks on the disk contain pits and lands.
- The track is a spiral.
- A laser is emitted and the laser light is reflected when it hits the lands, but is scattered when it hits the pits.
- Depending on whether the light is scattered light is encoded as a binary value of 0 and reflected light is encoded as a 1.
- The sensor is able to detect light reflected, but not scattered.
- Example: Blue-Ray (25 Gb) DVD (4.7 Gb), CD (700 Mb).

Advantages

- Can transfer easily between computers

Disadvantages

- Can scratch easily
- Not much storage compared with other methods.
- No unlimited writes to the hard disk



Solid state Drive

- Use millions of switches called floating gate transistors on microchips to store data.
- Electrons are stored in gates and this is encoded as 0 when there is an electron present and encoded a 1 when there is no electron present.
- The electros remain trapped even when there is no flow of electricity.
- Contain no moving parts and are therefore more robust that optical and magnetic storage.

Advantages

- Much faster that other means of storage
- More reliable than other means if you are only reading
- Quiet

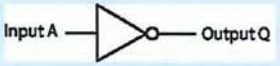
Disadvantages

- More expensive per volume of storage
- Reliability might be an issue if you do a lot of writing

Boolean Logic

NOT gate - The output is the opposite of the input

$$Q = \bar{A}$$
$$Q = NOT\ A$$



NOT truth table

Input	Output
0	1
1	0

AND gate - has two inputs and will have a true output if the two inputs are true otherwise the output will be false

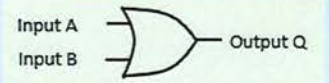
$$Q = A.B$$
$$Q = A\ AND\ B$$

AND truth table

Input - A	Input - B	Output
0	0	0
1	0	0
0	1	0
1	1	1

OR gate - has two inputs and will have a true output if either or both the inputs are true

$$Q = A + B$$
$$Q = A\ OR\ B$$

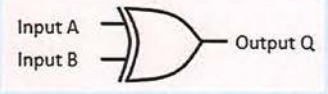


OR truth table

Input - A	Input - B	Output
0	0	0
1	0	1
0	1	1
1	1	1

XOR gate - has two inputs and will have a true output if either the inputs are true but not both

$$Q = A \oplus B$$
$$Q = A\ XOR\ B$$



OR truth table

Input A	Input B	Output
0	0	0
1	0	1
0	1	1
1	1	0

Converting a truth table to a logic circuit

There is a general approach to converting a truth table into a logic circuit.

We consider only the lines with an output of 1.
We take in the input of each and then AND.

We then OR between each statement such that
(NOT A AND B) OR (A AND NOT B). We can then draw the logic circuit.

Worked example: What is the logic circuit for the following truth table

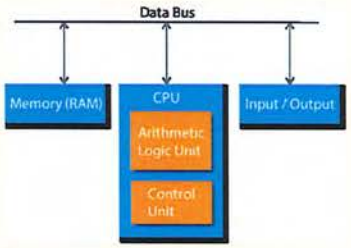
Input - A	Input - B	Output
0	0	0
1	0	1
0	1	0
1	1	1

(A AND NOT B) OR (A AND A)

System Architecture

CPU (Computer Processing Unit) or processor Fetches, decodes and executes instructions and performs logical and arithmetic operations.

Von Neumann architecture is the stored program concept, where program instructions and the data to be processed can be stored in the same memory.



Components of a CPU

Bus Wires through which data and instructions are transferred between computer components

Clock keeps all the CPU components synchronised

Arithmetic Logic Unit (ALU) Every operation takes place here. This is where the arithmetic (eg adding two binary numbers) and logic operations (eg checking to see if one number is bigger than another) take place.

Control Unit Decode the machine code instruction so that the ALU knows what to do with the instruction. Controls and monitors data transfer between different input and output hardware components

Factors affecting CPU performance

Clock speed is the number of cycles that a processor carries out per second. Each cycle of the CPU allows a single action (instruction) to be carried out. The greater the clock speed, the greater the number of operations and the faster the computer will run.

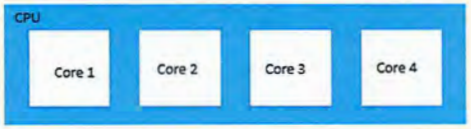
Number of processor cores A core is CPU in its own right. Nowadays most CPUs have multiple cores. Having multiple cores allows instructions to be carried out concurrently (at the same time), whereas a single core will only allow carry out instructions in serial (one at a time).

Latency Delay in transfer of data between components

Cache size Cache is a volatile memory store on the processor. Cache is much faster but smaller that RAM. Frequently used data and instructions within an application can be stored in cache instead of fetching from RAM which is quite slow. The bigger the cache the greater the volume of data and instructions that can be stored thereby reducing latency and improving performance of the CPU.

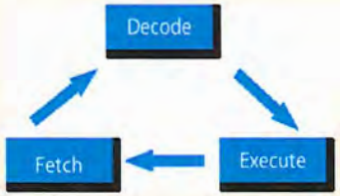
Cache type There are three levels of cache. Cache Level is a trade off between size and speed

- *Level 1 Cache* closest to the CPU and is the fastest cache (lowest latency), but does not have much capacity
- *Level 2 Cache* – is slower and further away from the CPU than L1 cache so latency is greater, but has more storage capacity.
- *Level 3 Cache* is the slower than L1 and L2 cache; much faster than RAM; has greater capacity than L1 and L2 cache.



Fetch execute cycle

1. Instructions are loaded into memory
2. Processor fetches the instruction from the main memory
3. Instruction is decoded so the CPU knows what to do with the instruction
4. Processor then executes the instruction
5. Result of the instruction can be stored in memory
6. Next instruction is then fetched from main memory and the cycle repeats itself.



Classification of programming languages

High level programming languages are closer to human language and is therefore easier to understand. A translator is used to convert the instructions into code that the computer understand. High level languages allow programs to be written that is independent of the type of computer. High level programming languages allow code to be written that is independent of the type of computer system. It is up to the compiler to translate the code into the right machine code for a particular code. There is a huge variety of high level programming languages, and the choice depends on the application.

Low level programming languages refer to machine code and assembly language. The Low level refers to low level of abstraction. The low level language is close to the language understood by the computer where operations map to the instruction in the processor instruction set. However it is difficult for humans to understand. Low level languages are appropriate for developing new operating systems, embedded systems and hardware device drivers

Machine code is expressed in binary values 0 and 1. This is the language that computers understand. All codes whether assembler or high level programming languages need to be translated into machine code. Machine code is specific to a processor.
Machine code instructions are made up of two parts the operator and the operand. The processor decodes the operator to identify the task that is to be carried out (eg. Add, load). The operand is the value or memory address that that instruction is to be operated on

Machine code instruction	
Operator	Operand
0011	10010100

Assembly language provides basic computer instructions for programs to run. There is a one to one relationship between machine code and assembly code instructions. One assembly language instruction maps to one machine code instruction, thus the structure of assembly language and machine code is the same, but where machine codes uses 0 and 1 which are very difficult for programmer to understand, assembly language uses mnemonics which is easier for the programmer.

Assembly language sample Instruction set

```
LOAD #23 # Load from RAM to processor
MOV a 23 # Transfer in number 23 into the variable a
ADD 2 3  # Add 2 values
STORE    # store data in RAM
```

Each type of processor has its own instruction set and therefore its own assembly language and machine code. So Assembly code written for one type of processor will not run on another.

Low level languages versus high level languages

	Advantages	Disadvantages
Low level	Produce code that is faster and better optimised than high level languages. Appropriate for developing new operating systems, embedded systems and hardware device drivers	Difficult to understand and modify Assembly code is written for a specific processor architecture, and so is not portable to other computer architectures
High level	High level programming languages allow code to be written that is more portable. Thus code can be run on different of the types of computer system with different processor architecture. Easier to understand Easier to modify	Needs a translator run slower because of the layers of abstraction and there is inefficiency in translator.

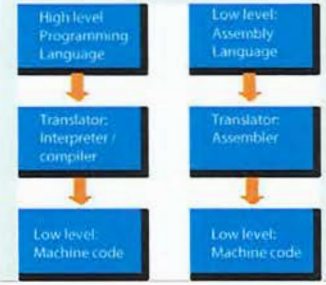
Program translators allow programs to be translated into machine code so the than programs can be run on a computer.

Interpreter converts high level languages into machine code one instruction at a time on-the-fly while the program is running. Each instruction is converted to machine code once the previous instruction has been executed. Interpreters are good for debugging code because the program stops as soon as the error has been found. However running code this way is much slower running compiled code. The machine code is not saved.

Compiler A program that converts high level languages into machine code before the program is run. A compiler saves the machine code,

so the source code is no longer needed A compiler allows a program to be run faster than interpreted code. Software is normally distributed as compiled machine code. For proprietary software this is good because other people cannot copy the code and use it for their own applications.

Assembler Assembler converts assembly language instructions into machine code.



Programming - Python

Comment – Text within the code that is ignored by the computer. A Python comment is preceeded by a #.

```
# This is an example of a comment
```

Output – Processed information that is sent out from a computer

Python	Pseudocode

`print("Hello World!")`
Hello World!
`print("Hello", "World!")`
Hello World!
`print("Hello"+"World!")`
HelloWorld!
`print("Hello\nWorld!")`
Hello
World!
	`OUTPUT "Hello World"`

Input – Data sent to a computer to be processed

`print("Enter name")`	`OUTPUT "Enter name"`
`name=input()`	`name ← USERINPUT`
`print("Hello", name)`	`OUTPUT "Hello", name`
`print("Enter age")`	`OUTPUT "Enter age"`
`age=int(input())`	`age ← USERINPUT`

Assignment - The allocation of data values to variables, constants, arrays and other data structures so that the values can be stored.

- *Variable* – Value that can change during the running of a program. By convention we use lower case to identify variables (eg `a=12`)
- *Constant* – Value that remains unchanged for the duration of the program. By convention we use upper case letters to identify constants. (e.g. `PI=3.141`)

Data Types

Integer	`age = 12`	`age ← 12`
Float (real) number	`height = 1.52`	`height ← 12`
Character	`a = 'a'`	`a ← 'a'`
String – multiple characters	`name = "Bart"`	`name ← "Bart"`
Boolean (true/false)	`a = True` `b = False`	`a ← True` `b ← False`

Arithmetic Operators

Add	`7 + 2`	`= 9`	`7 + 2`
Subtract	`7 - 2`	`= 5`	`7 - 2`
Multiply	`7 * 2`	`= 14`	`7 * 2`
Divide	`4 / 2`	`= 2`	`4 / 2`
power	`2 ** 3`	`= 8`	`2 ** 3`
Integer division	`7 // 2`	`= 3`	`7 DIV 2`
Modulus (remainder)	`7 % 2`	`= 1`	`7 MOD 2`

Relational Operators – Allows the Comparison of values

Less than	`<`	`<`	`7<2`	`-> False`
Greater than	`>`	`<`	`7 > 2`	`-> True`
Equal to	`==`	`==`	`7==2`	`-> False`
Not equal to	`!=`	≠ or <>	`7!=2`	`-> True`
Less than or equal to	`<=`	≤	`7<=2`	`-> False`
Greater than or equal to	`>=`	≥	`7>=2`	`-> True`

Boolean Operators

`AND`	`and`	`7 < 2 and 1 < 2`	`-> False`
`OR`	`or`	`7 < 2 or 1 < 2`	`-> False`
`NOT`	`not`	`not 7 < 2`	`-> True`

Sequencing represents a set of steps. Each line of code will have some operation and these operations will be carried out in order line-by-line

Using + operator for adding	

`a = 1`
`b = 2`
`c = a + b`
`print(c)  -> 3`
	`a ← 1`
	`b ← 2`
	`c ← a + b`
	`OUTPUT c`

Using + operator for concatenation	

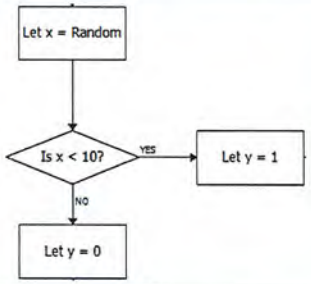
`a = 'Hello '`
`b = 'World'`
`c = a + b`
`print(c) -> Hello World`
	`a ← 'Hello '`
	`b ← 'World'`
	`c ← a + b`
	`OUTPUT c`

Random number

Random integer	`import random` `random.randint(0,9)`	`RANDOM_INT(0,9)`
Choice	`random.choice('a','b','c')`	
Random value from 0 to 1	`random.random()`	

Selection represents a decision in the code according to some condition. The condition is met then the block of code is executed otherwise it is not. Often alternative blocks of code are executed according to some condition.

```
x=RANDOM_INT()
IF  x < 10 THEN
 y=1
ELSE
 y=0
ENDIF
```



IF ...	`IF i > 2 THEN`
	`j ← 10`
	`ENDIF`
		`if i  > 2:`
		`j=10`

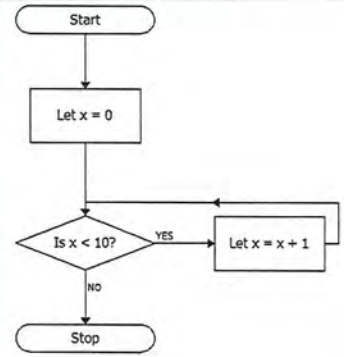
IF ... ELSE ...	`IF i > 2  THEN`
	`j ← 10`
	`ELSE`
	`j ← 3`
	`ENDIF`
		`if i > 2:`
		`j=10`
		`else:`
		`j=3`

IF ... ELSE IF ... ELSE	`IF i ==2 THEN`
	`j ← 10`
	`ELSE IF i==3`
	`j ← 3`
	`ELSE`
	`j ← 1`
	`ENDIF`
		`if i ==2:`
		`j=10`
		`elif i==3:`
		`j=3`
		`else:`
		`j=1`

Iteration Sometimes we wish the code to repeat a set of instructions

`WHILE` loops are used when the we do not know beforehand the number of iterations needed and this varies according to some condition.

```
x = 0
while (x < 10):
      x = x + 1
```



`while True:`
`print("Hello World")`
	`WHILE TRUE`
	`OUTPUT "Hello World"`
	`ENDWHILE`

`a=0`
`while a<4:`
`print(a)`
`a=a+3`
	`a ← 0`
	`WHILE a < 4`
	`OUTPUT a`
	`a ← a + 3`
	`ENDWHILE`

`FOR` loops are used when we know before hand the number of iterations we wish to make.

`for a in range(3):`
`print(a)`
	`FOR a ← 0 TO 3`
	`OUTPUT a`
	`ENDFOR`

Nested structures - Use constructs (e.g. WHILE, FOR, IF) inside another.

use a nested FOR loop to print out a grid	`for i in range (10):`
	`  for i in range (10):`
	`  print ("x ",end="")`
	`  print()`

Use a nested while and if to print out only even numbers	`i=0`
	`while i<51:`
	`  if (i%2==0):`
	`  print(i)`
	`  i=i+1`

Lists

Create a list	`shapes=["square","circle"]`
Access element by index pos	`shapes[1] -> circle`
Append item to list	`shapes.append("triangle")`
Remove item from list	`shapes.remove("circle")`
Remove item from list by index	`shapes.pop(1)`
Insert item into list	`shapes.insert(2,"rectangle")`
Number of elements in a list	`len(shapes)`
Get index pos of item in list	`shapes.index("triangle")`

Concatenating lists	`shapesGroup1["square","circle"]`
	`shapesGroup2=["triangle"]`
	`shapes=shapesGroup1+shapesGroup2`

Loop through list	`for i in range(len(shapes)):` `  print(shapes[i])`
Reverse elements in a list	`shapes.reverse()`
Order elements in a list	`shapes.sort()`

2D lists - A list if lists

Create a 2D list	`d = [ [23, 14, 17], [12, 18, 37], [16, 67, 83]]`

Another way to create a 2D list	`a = [23, 14, 17]`
	`b = [12, 18, 37]`
	`c = [16, 67, 83]`
	`d = [a,b,c]`

Access element by index position	`d[1][2] -> 37`

Strings

Get length of a string	`len("Hello")`	`LEN("Hello")`
Character to character code	`ord("a") -> 97`	`ORD("a")`
Character code to character	`chr(101) -> 'e'`	`CHR(101)`
String to integer	`a=int("12")`	`a=INT("12")`
String to float	`a=float("12.3")`	`a=FLOAT("12.3")`
integer to string	`a=str(12)`	`a=STR(12)`
real to string	`a=str(12.3)`	`a=STR(12.3)`

Concatenation -merge multiple strings together	`a="hello "`
	`b="world"`
	`c=a+b`
	`print(c) ->`
	`hello world`

Return the position of a character If there is more than 1 of the same character the position of the first character is returned.	`student = "Hermione"` `student.index('i')`
Find the character at a specified position	`student = "Hermione"` `print(student[2]) -> r`

sub strings - select parts of a string

Example	`student="Harry Potter"`	
Output the first two characters	`print(student[0:2])`	Ha
Output the first three characters	`print(student[:3])`	Har
Output characters 2-4	`print(student[2:5])`	Rry
Output the last 3 characters	`print(student[-3:])`	Ter
Output a middle set of characters	`print(student[4:-3])`	y Pot

*A negative value is taken from the end of the string.

Subroutines are a way of managing and organising programs in a structured way. This allows us to break up programs into smaller chunks.

- Can make the code more modular and more easy to read as each function performs a specific task.
- Functions can be reused within the code without having to write the code multiple times.

- **Procedures** are subroutines that do not return values
- **Functions** are subroutines that have both input and output

Procedure: No input parameters or return	`SUB greeting()`
	`  OUTPUT "hello"`
	`ENDSUB`
		`def greeting():`
		`  print("hello")`
		
		`call: greeting()`

Procedure: One input parameter, no return	`SUB greeting(name)`
	`  OUTPUT "Hello",name`
	`ENDSUB`
		`def greeting(name):`
		`  print("Hello",name)`
		
		`greeting("grey")`

Function: 1 input parameter, and 1 return value	`SUB add(n)`
	`  a ← 0`
	`  FOR a ← 0 TO n`
	`  a ← a + n`
	`  ENDFOR`
	`  RETURN a`
	`ENDSUB`
		`def add(n):`
		`  a=0`
		`  for a in range(n+1):`
		`  a=a+n`
		`  return a`

Function: Two input parameters, and 1 return value	`SUB (num1,num2)`
	`  sum=num1+num2`
	`  return sum`
		`def add(num1,num2):`
		`  sum=num1+num2`
		`  return sum`
		
		`greeting(1,2)`

The **scope** of a variable determines which parts of a program can access and use that variable.

A **global variable** is a variable that can be used anywhere in a program. The issue with global variables is that one part of the code may inadvertently modify the value because global variables are hard to track.

A **local variable** is a variable that can only be accessed within a certain block of code typically within a function. Local variables are not recognized outside a function unless they are returned. There is no way of modifying or changing the behavior of a local variable outside its scope.

Global variables need to defined throughout the running of the whole program. This is an inefficient use of memory resources. Local variables are defined only when they are needed an so have less demand on memory. Local variables only exist within the subroutine.

Reading and writing files

Open file Whatever we are doing to a file whether we are reading, writing or adding to or modifying a file we first need to open it using:

`open(filename,access_mode)`

There are a range of access mode depending on what we want to do to the file, the principal ones are given below:

Access Mode	Description
r	Opens a file for reading only
w	Opens a file for writing only. Create a new file if one does not exist. Overwrites file if it already exists.
a	Append to the end of a file. Create a new file if one does not exist.

Reading text files

read – Reads in the whole file into a single string	`f=open("filetxt","r")`
	`print(f.read())`
	`f.close()`

readline – Reads in each line one at a time	`f=open("file.txt","r")`
	`print(f.readline())`
	`print(f.readline())`
	`print(f.readline())`
	`f.close()`

readlines – Reads in the whole file into a list	`f=open("file.txt","r")`
	`print(f.readlines())`
	`f.close()`

Writing text files

Write in single lines at a time	`file=open("days.txt",'w')`
	`file.write("Monday\n")`
	`file.write("Tuesday\n")`
	`file.write("Wednesday\n")`
	`file.close()`

Write in a list	`say=["How\n","are\n","you\n"]`
	`file=open("say.txt",'w')`
	`file.writelines(say)`
	`file.close()`

Data Validation Routines

Check if an entered string has a minimum length	`OUTPUT "Enter String"`
	`s ← USERINPUT`
	`IF LEN(S) > 5 THEN`
	`  OUTPUT "STRING OK"`
	`ELSE`
	`  OUTPUT "TOO SHORT"`
	`ENDIF`

Check is a string is empty	`OUTPUT "Enter String"`
	`s ← USERINPUT`
	`IF LEN(S) == 0 THEN`
	`  OUTPUT "EMPTY STRING"`
	`ENDIF`

Check if data entered lies within a given range	`OUTPUT "Enter number" s num ← USERINPUT`
	`IF num > 1 AND num < 10`
	`  OUTPUT "Within range"`
	`ENDIF`

Authentication Routine

```
OUTPUT "Enter Username"
username ← USERINPUT
OUTPUT "Enter Password"
password ← USERINPUT

WHILE username != "bart" OR password !="abc"

 OUTPUT "Login failed"
 OUTPUT "Enter Username"
 username ← USERINPUT
 OUTPUT "Enter Password"
 password ← USERINPUT

ENDWHILE

OUTPUT "Login Successful"
```

Debugging

Syntax errors – Errors in the code that mean the program will not even run at all. Normally this is things like missing brackets, spelling mistakes and other typos.

Runtime errors – Errors during the running of the program. This might be because the program is writing to a memory location that does not exist for instance. eg. An array index value that does not exist.

Logical errors - The program runs to termination, but the output is not what is expected. Often these are arithmetic errors.

Test data

Code needs to be tested with a range of different input data to ensure that it works as expected under all situations. Data entered need to be checked to ensure that the input values are:

- within a certain range
- in correct format
- the correct length
- The correct data type (eg float, integer, string)

The program is tested using normal, erroneous or boundary data.

Normal data - Data that we would normally expect to be entered. For example for the age of secondary school pupils we would expect integer values ranging from 11 to 19.

Erroneous data - Data that are input that are clearly wrong. For instance, if some entered 40 for the age of a school pupil. The program should identify this as invalid data but at the same time should be able to handle this sensibly which returns a sensible message and the program does not crash.

Boundary data - Data that are on the edge of what we might expect. For instance if someone entered their age as 10, 11, 19 or 20.

GCSE Design and Technology

Year 10 GCSE D&T Knowledge organiser Spring Term: Metals

Threshold Concept

TC4-DT - Know the physical and working properties of different types of metal.
TC5-DT - Know the tools needed to cut, shape, join and apply finishes to metal.
TC6-DT - Understand the source origins of metal and how it is converted to workable forms.

The Big Questions:

- Where does metal come from?
- How is it made?
- What can we make with metal?
- What tools do we use for metal?

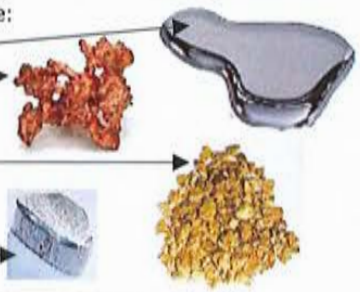
Most metals are found in the ground as ore.
All of the rocks in the picture here contain the ore for a different kind of metal. ores are dug out of the ground by mining.

The rocks containing the ore are ground up and placed in a furnace at a very high temperature.
Inside the furnace the ore turns to pure metal and is poured out into bars called ingots.
Once the metal is pure, you can use it to make things. The metal must be heated enough to make it Malleable.
These machines are making steel bars

There are 2 categories of metal: **Ferrous** and **non Ferrous**.

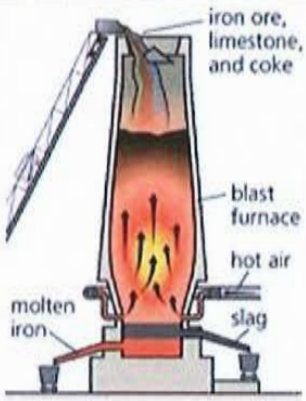
Ferrous metals contain Iron. Iron and steel are the most commonly used metals.

Non-ferrous (contain no iron) metals include:
aluminium
copper
lead
mercury
gold
nickel
tin
zinc.



Most of the Elements on the Periodic table are metals.

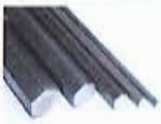
Non-Ferrous metals do not contain Iron. They are pure elements and are harder to find so more expensive



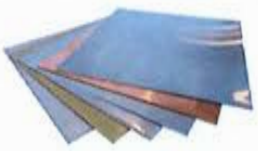
Iron is extracted from the ore using a blast furnace. Once molten hot it is formed and pressed into various shapes and sizes but like most metals it is made into a range of **stock forms.**


Flat bar


round bar


hex bar


Sheet metal in rolls or flat sheets




Sectional material named after the shapes: C,I,T,L and box


square and round tube

Metal work tools include:

Hammers for shaping or hitting **dot punches** to make small marks.

Odd leg callipers and **dividers** are used for marking straight or curved lines.
Metal is cut by hand using a **Hack saw**

Surface treatments and finishes

Some metal products that are made from **steel**, such as watering cans and lamp posts, would **rust** if they were not protected. A common process that is used to protect such products is **galvanising**. Steel products are given a zinc coating by dipping them into the molten **zinc.**
Plastic coatings can be applied to metal to protect them and add colour by dip coating them or powder coating them

Metal Properties

Most metals have good **conductivity.**
Copper has good **ductility**
Stainless steel is very **durable**
Gold and silver are considered precious because they are **aesthetically pleasing** but are not strong or tough.
Lead has a **low melting point**
Steel has excellent **tensile strength**
Aluminium is **lightweight but strong**

CNAT
Engineering
Design

Knowledge Organiser

Unit R039 – Communicating Design ideas

Project Brief

A national company produces a range of television (TV) appliances. As the design engineer, you have been tasked with designing the remote control unit that will support new TV equipment. Your design will be packaged with the TV and be available to be purchased online and in electrical goods retailers.

- The remote control should:
- consist of a moulded construction
- be comfortable to hold
- be sized to suit the 5th to the 95th percentile range
- include buttons to press
- include numbers 1 through to 0, play, fast forward, rewind, pause and stop as a minimum
- allow users to easily identify its functions
- be aesthetically pleasing
- be powered by two single AA batteries
- have a maximum size no greater than 220 mm × 80 mm × 30 mm.

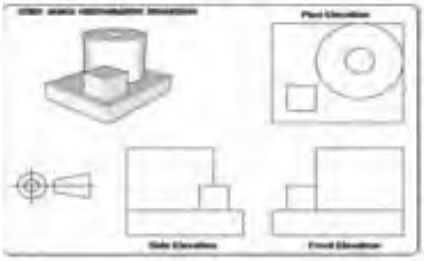
Topic Area 1

Freehand drawing techniques. Production of 2D and 3D designs drawn by hand. Use the isometric grids to help keep the design ideas following an ISOMETRIC convention. Use of colour rendering along with full use of notes and annotation (include key features, functions, dimensions, materials etc)

Topic Area 2

Produce a 3rd angle Orthographic projection drawing.

Orthographic Projections are formal drawings that are drawn in 2D. The generally show three faces; the front view, the side view and the top view. These have to be in specific places. These should be drawn neatly and dimensions added in a specific way (normally below and to the left).



Topic Area 3

Use of Computer Aided Design – CAD

Computer Aided Design allows for fast, accurate production of design ideas. There are many different packages such as Autodesk, ProDesktop, Solid works that are used to produce high quality designs . Your final designs will be produced using CAD and must show orthographic projection and full rendered

Exploded and Assembly drawings allow you to show how your design would be manufactured and assembled. It allows you to show DFMA (design for Manufacture Assembly) as well as DFM (Design for Maintenance)

Enterprise

BUSINESS: *Creating informed, discerning employees, consumers and future leaders*

Enterprise and Marketing KO

Key Vocabulary

Design mix – the combination of aesthetics, function and cost that are the combined design priorities for a product

Aesthetics – how things appeal to the senses, i.e. look, smell, sound

Function – how well the product or service works for the consumer

Economic manufacture – making a product cheaply enough to make it profitable

Product life cycle – the theory that every product goes through the same stages

Introduction phase – phase of the product life cycle when a product is developed and launched onto the market

Growth phase – phase of the product life cycle where sales are growing; costs will be very high

Maturity phase – phase where sales and revenue is at the highest point

Decline phase – phase when sales are dropping

Extension strategy – an attempt to prolong sales of a product to avoid the decline phase

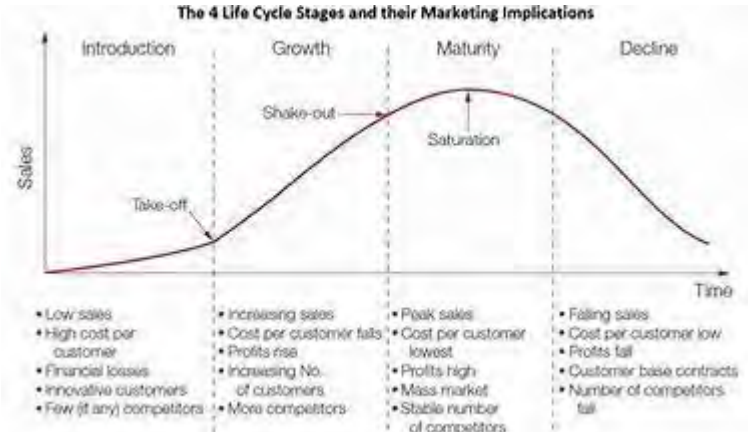
Product differentiation – the extent to which consumers see your product as distinct from rivals

Core Knowledge

The design mix is a diagram to show how a business must consider the aesthetics and function of a product as well as the cost.

When creating a product a business will want it to stand out from rivals. This is known as product differentiation. Businesses can use branding or USPs.

The Product life cycle shows the stage that every product goes through. A business will use extension strategies to extend the life cycle.



Don't be a "man on the street"

- Don't assume everyone prefers branded products – some consumers will consider cost more important
- Remember that all products will see a decline in sales, eventually, but the time this takes will differ
- Just because a product is in decline does not mean it must be withdrawn – it may still contribute a considerable amount of revenue

Wider Business World

Apple – use of branding and extension strategies

Kellogg's – developed new products such as cereal bars to meet customer needs

KitKat – launched different flavours and sizes as an extension strategy

Synoptic Links

Customer needs – if these change products will need to change

Market research – how a business finds out customer needs

External influences – will lead to changes in 4Ps

Operations – need to be able to make the product

Breakeven – understanding the link between costs and economic viability

Food Preparation and Nutrition

Cooking of food and heat transfer

Why do we cook food?

Applying heat to food is advantageous for a number of reasons. It not only makes the food safe to eat, but also gives it the desired palatability and organoleptic qualities.

	Explanation	Example
To make it safe to eat	Heat kills bacteria and parasites, inactivates harmful enzymes and toxins	Salmonella in chicken, listeria in milk, solanine in potatoes and green tomatoes
To develop flavours	Water evaporation makes flavours more pronounced, sugar caramelisation and other reactions change the initial flavour of the food	Stew, goulash, sauces, crème brûlée
To improve texture	Cooking alters the texture of food products, making them easier to chew and more pleasurable to eat	Roast meat becomes softer and easier to chew; chips become crunchy
To improve shelf life	Cooking kills microorganisms which could spoil the food, so it can be stored for longer	Clostridium botulinum in meat preserves, mould in jam
To increase variety	One product may be cooked in many different ways	Potatoes can be served boiled, mashed, as chips, in a salad, roasted, dauphinoise, etc.

Heat transfer

Various methods of heat transfer are often combined to obtain the desired meal.

	Conduction	Convection	Radiation
How does it work?	Direct transfer of heat from the saucepan to the food inside → Heat makes metal particles vibrate → Vibrations of the metal are transferred to the particles of food → Food particles vibrate and the meal heats up	Indirect transfer of the heat through water or air Convection current makes the hot air / steam go up while the colder air falls	Indirect transfer of heat through heat waves → Microwaves send electromagnetic waves, which heat up water particles in the food → Water particles begin to vibrate and, therefore, heat up the whole meal Infrared radiation is used in grills and barbecues
Pattern	**Hob → pan → food**	**Oven → Air → Food**	**Heat → waves → food**
Example	• Melting butter in a pan • Boiling water • Roasting meat	• Steaming vegetables • Boiling eggs • Baking muffins	• Grilling meat • Toasting bread • Microwaving soup

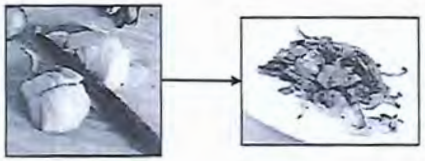
Methods of cooking

Various methods of cooking have different effects on the nutritional value and palatability of food. Choosing the right method helps to obtain a desired meal without decreasing the amount of vitamins and minerals in it.

How does cooking affect food?

Appearance	Meats shrink, cakes rise, eggs become solid, sauces thicken, rice and pasta increase in size.
Colour	Foods become golden or brown. Red and green vegetables may lose colour.
Flavour	May become sweeter, more pronounced, rich.
Texture	Eggs set, vegetables and meats soften, chips become crunchy, bread becomes crispy, custard becomes creamy, sauces thicken.
Smell	Is more pronounced because essential oils fill the air and are more easily detected by the olfactory system.

At high temperatures, sugar and protein react with each other, producing brown compounds which affect the colour, taste and smell of foods such as cocoa or coffee. This is called the **Maillard reaction.**



During cooking, onion becomes brown, soft and sweet.

Cooking methods...

Cooking improves the shelf life of food. Cooked food can be safely stored and eaten for longer than raw food.

Water-based methods	
Steaming	Helps preserve nutritional value of food. Low in fat.
Boiling	May cause vitamin loss. Low in fat.
Simmering	Long time required. Causes vitamin loss.
Blanching	Prevents enzymic browning and oxidation, preserves nutritional value.
Poaching	Ideal for preparing delicate ingredients.
Braising	Long time required. Causes vitamin loss

Dry methods	
Baking	Long time required. Causes vitamin loss. Palatability is improved (cakes and other baked goods become sponge-like and often have crispy top).
Roasting	Helps to reduce amount of fat in food. Long time required. Decreases vitamin content. Helps to obtain a crispy skin or surface.
Grilling	May create harmful substances. Usually low in fat.
Dry-frying	Reduces amount of fat in food. Nutritional value is preserved.

Oil-based methods	
Deep-frying	Foods become golden and crunchy, but their nutritional value is poor (loss of vitamins, and high fat content).
Shallow-frying	Seals the surface of food and helps to obtain crunchy top and juicy interior.
Stir-frying	Low-fat. Helps to preserve nutritional value of food.

Food spoilage and contamination

Food spoilage may be caused by many various microorganisms – bacteria, yeast and moulds – as well as by enzymes naturally present in the food products. It is important to correctly store food and apply food safety principles to avoid spoilage and contamination of other products.

Microorganisms

Tiny organisms visible only under a microscope, e.g. bacteria, yeast and mould

Growth conditions

Warmth – ideally a temperature between 5 °C and 63 °C
Water – microorganisms grow better in moist conditions
Food – ideally protein, but sometimes also sugar
Time – the longer the time, the more time microorganisms have to multiply

Most microorganisms will grow rapidly in **danger zone temperatures** (5 °C to 63 °C) but will not grow below or above this limit. This is because enzymes necessary for replicating the cell become inactive at temperatures below 5 °C and over 63 °C.

Microorganisms' growth can be controlled by:

- ✓ Storing food in proper conditions
- ✓ Freezing or refrigerating fresh food
- ✓ Cooking food thoroughly before eating
- ✓ Not refreezing food once it has been defrosted

High-risk foods

Foods which have **optimal** conditions for microorganisms' growth

Protein-rich, moist and usually raw
Include meat and poultry, fish and seafood, eggs and milk

Enzymes

Biologically active protein-based molecules.
They are **catalysts**, which means that they can speed up the rate of chemical reactions.
Enzymes are necessary for fruit to ripen.

Darkening of fruit and vegetables caused by enzymes is called **enzymic browning** and should be avoided to preserve nutritional value of food.

Enzymic action can be stopped by:

- ➢ **Blanching** vegetables before freezing
  Blanching means that food is put into boiling water then immediately plunged into cold water or ice.
- ➢ **Use of acids** (lemon juice or vinegar)
  Acid denatures and deactivates enzymes, because they are built of protein.

Enzymes are also used in food production.

Cross-contamination

- **Cross-contamination** is when bacteria, toxins or food particles are transferred to a food product.
- Cross-contamination can cause **food poisoning** and allergic reactions.
- **Anaphylactic shock** is a life-threatening reaction of the immune system to an allergen, e.g. food

Food can become contaminated by:

- × waste food and rubbish
- × pests and rodents
- × the cook's hands
- × work surfaces and equipment
- × other contaminated foods, including high-risk foods

Most common allergens:
Nuts
Fish and seafood
Milk
Eggs

More on p. 14

Use in food production and signs of food spoilage

Many species of microorganism and some enzymes can cause food spoilage or diseases.
Others are used in manufacturing of various food products.

	Food spoilage	Use in food manufacturing	Why does this work?
Bacteria	*Clostridium botulinum* produces a toxin which causes meat preserves to bulge. Most bacteria do not cause visible signs of spoilage, so poisoning is possible even if the food looks and smells normal.	Cheese uses a starter culture called *Lactobacillus* bacteria to give it a balanced aroma taste and texture. Yoghurt also uses the same starter culture to help milk clot. Probiotics are also used to help benefit health.	Bacteria ferment lactose from milk and turn it into lactic acid, which gives the food a sour taste and coagulates protein in milk, which, for example, causes yoghurt to become thicker.
Yeast	Ferments sugar in juices and beverages, making them sour, fizzy and foamy.	Bread, doughnuts and other baked goods use yeast to help them rise.	Yeast ferments sugar in foods and produces carbon dioxide to help it rise. It also creates fizz in some alcoholic drinks.
Mould	Creates a green, white or black coating on food products such as bread, grapes, tomatoes and jams.	Blue cheeses, such as Stilton, have a mould called *Penicillium* added to give them a distinctive texture, taste and aroma.	Mould breaks down polysaccharides into shorter chains, which changes the taste of the food.
Enzymes	Turn bananas, apples, potatoes and other foods brown.	Rennet is an enzyme used in cheese production to coagulate milk.	Enzymes react with oxygen and turn yellow pigments in food into brown melanin.

Faecal contamination with *E. coli* may take place when people don't wash their hands after using the toilet or when human and animal body waste is used to fertilise crops.

Food poisoning

- Food poisoning is a disease caused by eating spoiled or contaminated food. Such food may contain certain microorganisms, toxins or enzymes.
- Microorganisms which cause diseases are called **pathogenic**.
- A person who carries a pathogen but shows no symptoms of a disease is called a **carrier**.

Food poisoning bacteria and where to find them:

- × ***Campylobacter*** → raw poultry and unpasteurised milk
- × ***E. coli*** → undercooked beef, unwashed vegetables, dirty hands
- × ***Salmonella*** → raw eggs, meat and poultry, unpasteurised milk
- × ***Listeria*** → ready-to-eat foods, unpasteurised milk, dirty hands
- × ***Staphylococcus aureus*** → salads, ham, eggs, tuna, poultry, cream, hands of an infected person

Cross-contamination and food poisoning may be avoided by:

- ✓ washing hands after dealing with high-risk foods, rubbish or using a toilet
- ✓ properly cleaning work surfaces and utensils
- ✓ using dedicated, colour-coded utensils only
- ✓ storing food in proper conditions
- ✓ storing raw and cooked foods separately
- ✓ cooking food thoroughly before eating
- ✓ applying food safety standards and schemes, such as the British Lion Scheme

Symptoms of food poisoning:

- ☹ Stomach pains and cramps
- ☹ Nausea and vomiting
- ☹ Diarrhoea
- ☹ Fever
- ☹ Shivering

British Lion Scheme
Food safety mark which guarantees that eggs are produced in the UK and that all the hens have been vaccinated against salmonella.

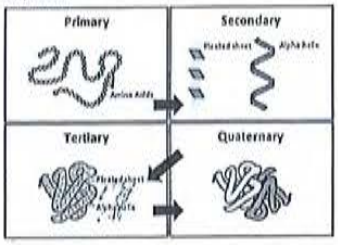
Food Science

Functional and chemical properties of food 1

Proteins

Macromolecules built of thousands of amino acids bonded together into long chains
Amino acids → peptides → polypeptides (proteins)

The structure of proteins:



Functional and chemical properties:

1. Denaturation – damage of the protein's structure caused by:
   a. Heat – during cooking, proteins vibrate quickly and, as a result, hydrogen bonds in them rupture.
   b. Acid – hydrogen atoms from the acid bind with nitrogen from the protein, preventing it from forming hydrogen bonds within protein molecule, and so it cannot form a 3D structure.
   c. Mechanical action – during whisking, protein uncoils and exposes hydrophobic areas, which stick together and form a foam.
2. Coagulation – aggregation of protein particles into larger lumps, causing it to set. Examples of protein coagulation include cheese becoming rubbery when overheated and egg whites becoming solid when cooked.

During cooking, the protein in eggs coagulates and denatures, and causes the eggs to set.

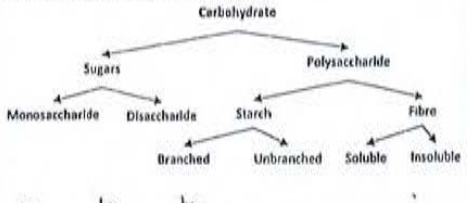
3. Syneresis – leakage of water from overcooked (and over-coagulated) proteins. Usually associated with eggs.
4. Gluten formation – complex, net-like protein built of glutenin and gliadin, simple proteins present in wheat, rye, barley and oats; the two proteins cross-link with each other, creating a net (as in a sweater) which can hold air bubbles during proving and baking of bread and bakery products.

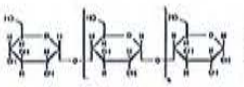
   glutenin + gliadin + water → gluten net → soft, springy texture
5. Foam formation – air bubbles trapped in a liquid (e.g. egg white). Whisking makes proteins unravel and denature.

The chemical structure of food ingredients plays a vital role in how they can be used in cooking. Applying heat to proteins, carbohydrates and fats usually damages their structure, which helps to obtain the desired effect.

Carbohydrates

Macromolecules which include mono-, di- and polysaccharides (built of thousands of monosaccharides bonded together)



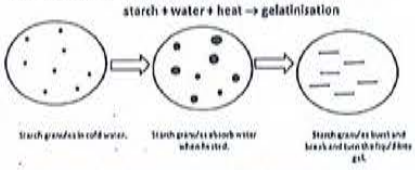


Amylose is an example of a polysaccharide built of thousands of glucose molecules

Functional and chemical properties:

1. Gelatinisation – happens when starch granules absorb water, swell and break during heating, causing mixture to thicken and form a gel when cooled; used to prepare sauces and puddings.

   starch + water + heat → gelatinisation



2. Dextrinisation – happens when starch chains break down into shorter chains of dextrins; during the process, molecules of water evaporate and carbon is left to give brown colour; occurs during baking and toasting bread and other baked goods.

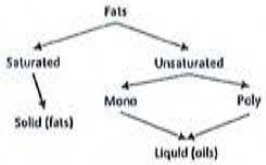
   starch + heat → dextrinisation
3. Caramelisation – happens when sugar is heated to a very high temperature, causing it to liquidise and form a thick, brown syrup; during the process, water evaporates and carbon is left to create a brown or black colour; occurs during roasting of vegetables, making caramel and fudge, etc.

   sugar + heat → caramelisation

Fats and oils

Macromolecules built of a glycerol head and fatty acid tail

Fat particles are immiscible – they are repelled by water molecules and separate from it, forming little droplets of oil in the mixture, and eventually creating a coat on top of it.



Functional and chemical properties:

1. Shortening – when fat particles surround starch so that it cannot access water and, therefore, prevent gluten formation; technique used to obtain crunchy, crumbly pastry such as biscuits.
2. Aeration – trapping air bubbles in a fat mixture, e.g. cream or butter, to improve its texture.
3. Plasticity – ability of fat to be easily spreadable and melt at various temperatures, depending on the length of the fatty acid chains in the fat particle.

Plasticity is increased when butter melts.

4. Melting point – temperature at which fat turns into oil.
5. Emulsion – stable mixture of oil and water
   Water-in-oil emulsion → butter
   Oil-in-water emulsion → milk

   To create a stable emulsion, emulsifiers need to be used, e.g. lecithin from egg yolk is used to make mayonnaise. Emulsifiers bind together molecules which normally wouldn't bind and prevent them from separating.

Food Safety

Functional and chemical properties of food 2

Fruit and Vegetables

Food preparation and cooking may have a large impact on the nutritional value, appearance, flavour and smell of food products.

Foods such as bananas, apples and tomatoes need time to ripen. This ripening process is caused by enzymes.

Enzymic browning

Involves the discoloration of fruits and vegetables as a result of oxygen reacting with enzymes and plant cells substances.

Cutting, shredding, grating, biting, peeling, etc. → Enzymes from the cytoplasm are activated by oxygen from air and mix with the substances from the vacuole → Leads to damage of cell vacuoles (spaces) and cytoplasm (outside of vacuole) → Leading to a corrosive effect (brown colour and vitamin loss)

This process can be slowed down or accelerated...

Slowed down by:
- ↓ lowering temperature
- ↓ inactivating enzymes with the use of heat (blanching) or acid (vinegar / lemon juice)
- ↓ removing oxygen / protecting from air

Accelerated by:
- ↑ iron and copper
- ↑ diminution
- ↑ oxygen exposure

Foods most prone to enzymic browning:
- Fruit: avocados, bananas, peaches, pears, apples, mangoes, apricots, plums, grapes
- Vegetables: aubergines, mushrooms, potatoes, lettuce

Oxidation

- The process when substances combine with oxygen
- Destruction of chemicals in food due to oxygen exposure
- Causes changes in the appearance, smell and nutritional value of food

Slowed down by:
- ↓ covering food
- ↓ packing food in oxygen-free conditions
- ↓ covering food with sauces and dressings

Accelerated by:
- ↑ diminution
- ↑ oxygen exposure

Raising Agents

Some ingredients and processes are used in cooking to allow gases into a mixture causing it to rise in order to create a desired texture.

Three gases are used for leavening:
- air – introduced by mechanical processes
- carbon dioxide – introduced by biological and chemical processes, such as yeast in bread or using bicarbonate of soda
- water vapour (steam)

Raising agents are used to:
- lighten the texture of the food
- enable raising during cooking
- make food more appetising

Mechanical raising agents

Mechanical methods trap air bubbles in the mixture or between layers. During cooking the air expands, causing the mixture to rise.

Method	Examples
Whisking	meringue, whisked sponge, cloud eggs
Beating	batter, rich sponge
Folding	flaky pastry, filo pastry
Rubbing in	pastry, scones, crumble
Sieving	sponge, pastry, scones
Creaming	rich sponge, cakes, buttercreams

Methods can also be combined to obtain the desired effect.

Steam or water vapour is the gaseous form of water. It is produced each time a wet food is heated up. As the hot steam rises and expands, it causes a pastry or dough to rise with it.

Biological raising agents

Yeast is a single-celled fungus used in the production of baked goods, cheese, wine and beer.

Yeast + sugar + warmth + liquid → carbon dioxide + alcohol/acid

During fermentation, yeast transforms sugar into carbon dioxide and alcohol or acid. The carbon dioxide causes small bubbles to form, raising the dough.

Chemical raising agents

Bicarbonate of soda + acid + water + heat → carbon dioxide + water

Baking powder = bicarbonate of soda + calcium phosphate

- Baking powder doesn't need the addition of acid because it already contains an acidic ingredient.
- Self-raising flour contains baking powder or other leavening agents.
- During baking, CO_2 bubbles form and cause the batter to rise, while proteins set and, therefore, a cake obtains a stable structure.

Principles of food safety

Applying certain hygiene rules and properly storing food products helps to prevent food spoilage and contamination, and lowers the risk of food poisoning or allergic reaction.

Temperature control

is important for preventing food spoilage and bacterial growth.

The following temperature guidelines are set out for storing and cooking foods.

Freezing	-18 °C
Chilling	0 °C to 5 °C
Cooking	75 °C
Reheating	75 °C

5 to 63 °C

Temperature Danger Zone

Range of temperatures at which microorganisms grow the fastest, posing a risk of food spoilage and food poisoning

Key Terms

Shelf life: Period of time during which food can be safely stored and eaten
Food poisoning: Illness caused by eating contaminated food or drinking contaminated water
First in, first out: Rule which says that the oldest foods should be eaten first
Vacuum packing: Packing food in airtight foil bags to remove oxygen and prevent spoilage

PERISHABLE FOODS

Foods which have a fairly short shelf life and need to be stored in the fridge

- Raw and cooked meat, especially minced
- Raw and cooked poultry
- Raw and cooked fish and shellfish
- Milk and dairy
- Eggs
- Vegetables and fruit

An **insulated cold bag** can be used to transport high-risk foods and maintain their low temperature.

Correct use of a domestic fridge and freezer

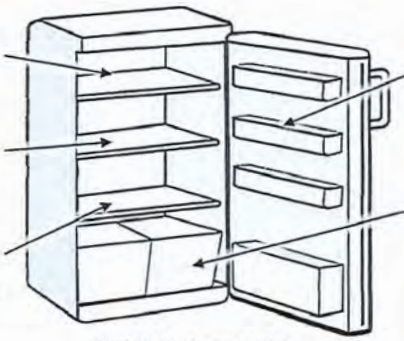
will ensure freshness and safety of food

Fridge temperature: 0 to 5°C

Top shelf
Ready-to-eat foods, dairy, yogurt, cream

Middle shelf
Butter, covered cooked meats, packaged foods

Bottom shelf
Raw meat, poultry and fish in sealed boxes



Door
Eggs, condiments, sauces

Drawers
Fresh vegetables and salads

Important storage points

Tainting means that the smell of one food contaminates another food	Always keep food covered or sealed to avoid tainting!

Freezer temperature: -18 °C

Fast-freeze button: -25 °C

Freezer burn involves the dehydration and oxidation of food caused by improper freezing (e.g. inadequate packaging)	Use special freezer bags to avoid freezer burn Do not overload to enable air circulation

STOP

Defrosting = thawing

Defrost foods in a box or on a tray to catch any leaking liquids.	**Never refreeze defrosted food!** The bacteria in food begin to multiply in defrosted food so it's best to use it straightaway to avoid the risk of food poisoning.

Food covering

- ✓ Protects from light
- ✓ Protects from air, oxygen and dust
- ✓ Protects from pests and rodents
- ✓ Prevents tainting

Ambient Storage

Storing food at room temperature (usually around 20 °C)

Food temperature probe

Helps measure the temperature in the food core and ensures that it is properly cooked

1. Clean and disinfect the probe before using
2. Insert into the thickest part of the food, making sure not to touch the tin or bone with the tip of the probe
3. Wait a couple of minutes for the temperature to stabilise
4. Read the temperature
5. Remove the probe
6. Clean and disinfect after use

Date marks

Best before – applies to food quality (look, flavour and colour) and it's relatively safe to eat the food after that date; it is used on dry, frozen or tinned foods and eggs

Use by – applies to food safety so it might be harmful to eat a food after that date; used on fresh foods such as milk and dairy

Food safety principles when cooking and preparing food

Applying these rules will help to keep the food safe for consumption and prevent spoilage

Personal hygiene

- ✓ Always wash hands before and after cooking and dry with disposable paper towels
- ✓ Avoid touching your face or hair
- ✓ Tie your hair back and cover with a hairnet
- ✓ Avoid cooking when you're ill
- ✓ Change clothes and use an apron
- ✓ Cover any wounds with a waterproof plaster
- ✓ Do not wear rings or other jewellery when cooking

Work surfaces

- ✓ Clean thoroughly after dealing with high-risk foods
- ✓ Use soapy hot water or antibacterial spray to clean any spills
- ✓ Use a clean kitchen towel or disposable paper towels

Separate foods

- ✓ Separate raw and cooked foods, both when preparing and storing food
- ✓ Cover prepared food and store in closed containers
- ✓ Use dedicated, colour-coded utensils
- ✓ Wash dishes straightaway in hot water to avoid pests and cross-contamination

Temperature control

- ✓ Make sure the temperature inside food reaches 75 °C both when cooking and reheating
- ✓ Make sure the temperature of served food is above 63 °C
- ✓ Do not put hot food straight into the fridge – let it cool for 90 minutes
- ✓ Ensure correct cooking time to avoid cold spots
- ✓ Defrost thoroughly to avoid cold spots

French

French Year 10 Spring Term – De La Ville à la Campagne

Objective: To discuss where you live

Threshold Concepts: In French, there are several translations of the preposition "in".

Most French adjectives are positioned after the noun and agree with the gender of the noun they are describing.

To form the superlative in French, the structures "le plus / le moins "+ adjective are used. Unlike in English, there is no equivalent to the suffix "-est" in French. The position of the superlative structure is determined by the position of the adjective used. Most superlative structures go after the noun.

Questions are formed in different ways in French.

French Phonics

Where I live

J'habite…
dans une ville – in a town
au centre-ville – in the town centre
à la campagne
à la montagne
en angleterre
en ecosee – in scotland
au pays de Galle – in Wales
on peut – you can
faire du cheval
faire du ski
faire des promenades
faire les magasins
se detendre dans la mer
visiter le chateau – visit the castle
il y a – there is
il n'y a pas de – there isn't / aren't
un marché – a market
un stade – a stadium
une bibliothèque – a library
une église
une gare – a train station
des colines – hills
des stations de ski – ski resorts
des vignobles – vineyards

The **Oak National Academy** website has lessons which accompany work on this topic

The Weather

il fait beau – the weather is fine
il fait mauvais – the weather is bad
il fait chaud – the weather is hot
il y a du soleil – it is sunny
il y a du brouillard – it is foggy
il y a du vent – it is windy
il y a un orage – there is a storm
il pleut – it's raining
il neige – it's snowing
il grêle – it's hailing

Adjectives

c'est – it is
sale – dirty
propre – clean
pollue – polluted
anime – lively
tranquille – calm
bruyant – noisy
touristique – touristic
moderne – modern
hante – hauntedhttps://www.bbc.co.uk/bitesize/guides/z389kqt/revision/1
vieux – old
grand - big

Saying "in"

There are several ways of saying *in*:
en – feminine countries
en France – in France
au – masculine countries
au Portugal
à – a town or city
à Paris – in Paris
dans *une ville – in a town*
au *centre-ville – in the town centre*
en *ville – in town*

Question formation

You can ask a question in 3 ways.
Use voice intonation
Use "est-ce que"
Use inversion of the subject and verb.

Adjectives in French

Most adjectives go after the noun.
un chateau magnifique
There are some exceptions:
beau / belle – beautiful
vieux / vielle – old
nouveau / nouvelle – new
joli (e) - pretty
grand(e) / petit(e) – big / small

Adjectives also "agree" with the gender of the noun
La belle église – the beautiful church
Le grand château – the big castle
La nouvelle patinoire – the new ice rink
Le nouvel cinéma – the new cinema

The Superlative

The superlative is used to express that something is *the best, biggest, most interesting, least boring*, etc.
In French, you use the structures:
le plus_____ + adjective to express the idea of "the most…."
le moins_____ + adjective to express the idea of "the least…."

The position of the superlative in a sentence depends on where the adjective is positioned. Most adjectives are positioned after the noun, therefore most superlatives are too:
Le château le plus intéressant - the most interesting castle
A few adjectives are positioned before the noun:
Le plus grand château – the biggest castle

Geography

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T1

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Landscapes and physical processes

Geography Knowledge Organiser

1.1.1 - Distinctive landscapes

Upland Areas +600m

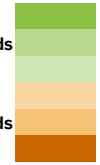
Peaks and ridges. Cold, misty and snow common. i.e. Scotland

Lowland areas -200m

Flat or rolling hills. Warmer weather. i.e. Fens

Relief of the UK

Relief of the UK can be divided into uplands and lowlands. Each have their own characteristics.



Glaciation in the UK

Over many thousands of years, glaciation has made an impression on the UK's landscape. Today, much of upland Britain is covered in u-shaped valleys and eroded steep mountain peaks.

During the ice age

Ice covered areas eroded and weathered landscapes to create dramatic mountain scenery.

After the ice age

Deep valleys and deposition of sediment revealed

What is a landscape?

A landscape has visible features that make up the surface of the land. Landscapes can be broken down into four 'elements'.

Landscape Elements

Physical	Biological
-Mountains	-Vegetation
-Coastlines	-Habitats
-Rivers	-Wildlife
Human	**Variable**
-Buildings	-Weather
-Infrastructure	-Senses

1.1.2/3 - Human activity

Honeypot site - A location which attracts a large number of tourists who, due to their numbers, place pressure on the environment and local people.
Carrying capacity - The number of people which a region can support without damaging the location and environment.
Visitor pressure - tourists who, due to their numbers, place stress on the environment and local people.

Positives of visitor pressure	Negatives of visitor pressure
Employment opportunities are created to meet the demands of the tourists	Jobs are often seasonal or part time. This makes it harder to support family.
Tourism brings in money and will boost the local economy	There is overcrowding in the peak seasons
There will be upkeep of the area, making it a clean place to live	Businesses are designed for the tourists
Crime can be reduced due to higher levels of employment	There can be congestion on the roads
	Scenic walks and hikes are damaged by footpath erosion

(1.1.3) Management: repairing footpaths

Stone pitching - This technique involves digging stone into the ground to form good solid footfalls. This ancient technique is used extensively in the central fells using stone which is naturally occurring.

Soil Inversion - A digger is used to construct a ditch drain. The soil removed from the drain is placed alongside to create a hard wearing walking surface. Grass seed mix is then sown to encourage vegetation to bind all the works together.

Sheep wool - The fleece is placed between the soil and the stones to prevents the stone from sinking into the soil. This creates a 'floating' path and also absorbs some water to slow surface runoff.

1.2.1 - Processes & landforms (Rivers)

Erosion

Attrition	Rocks that bash together to become smooth/smaller.
Solution	A chemical reaction that dissolved rocks.
Abrasion	Rocks hurled at the base of a cliff to break pieces apart.
Hydraulic Action	Water enters cracks in the cliff, air compresses, causing the crack to expand.

Transportation

Solution	Minerals dissolve in water and are carried along.
Suspension	Sediment is carried along in the flow of the water.
Saltation	Pebbles that bounce along the sea/river bed.
Traction	Boulders that roll along a river/sea bed by the force of the flowing water.

Deposition

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

Freeze-thaw weathering

Stage One
Water seeps into cracks and fractures in the rock.

Stage Two
When the water freezes, it expands about 9%. This wedges apart the rock.

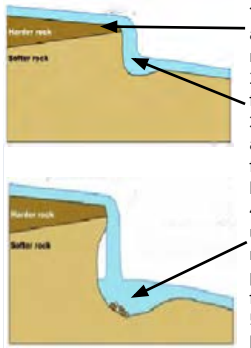
Stage Three
With repeated freeze-thaw cycles, the rock breaks off.

Weathering

Chemical
Action of chemicals within water dissolving the rock.

Biological
Rocks that have been broken down by living organisms or plant roots.

Formation of a waterfall

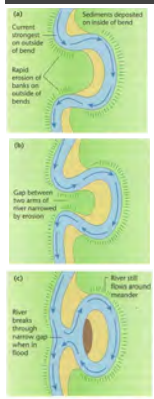


1) River flows over alternative types of rocks.
2) River erodes soft rock faster creating a step.
3) Further hydraulic action and abrasion form a plunge pool beneath.
4) Hard rock above is undercut leaving cap rock which collapses providing more material for erosion.
5) Waterfall retreats leaving steep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

Formation of floodplains and levees

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

Formation of a meander

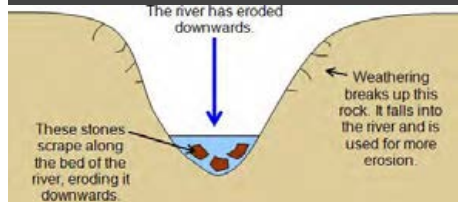


A meander is a curve in a river's course formed when erosion and deposition take place on opposite river banks. The two sides of the meander eventually meet and create a straight channel.

Inside bend:
Slowest speed
Deposition
Slip-off slope/point bar

Outside bend:
Fastest speed
Erosion
River cliff/undercut

Formation of a V-shaped valley



River long profile

Upper course

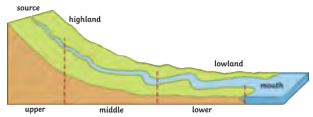
Near the source, the river is flows over steep gradient from the hill/mountains. This gives the river a lot of energy, so it will erode the riverbed vertically to form narrow valleys.

Middle course

Here the gradient get gentler, so the water has less energy and moves more slowly. The river will begin to erode laterally making the river wider.

Lower course

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



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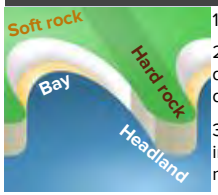
1.2.1 - Processes & landforms (Coasts)

Formation of bays and headlands

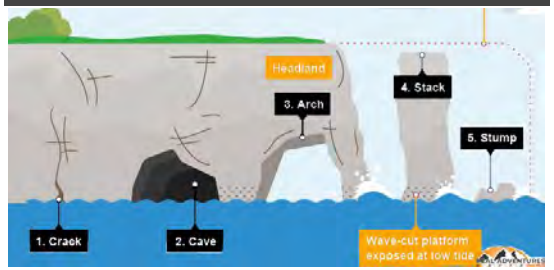


1) Waves attack the coastline.

2) Softer rock is eroded by the sea quicker forming a bay, calm area cases deposition.

3) More resistant rock is left jutting out into the sea. This is a headland and is now more vulnerable to erosion.

Formation of coastal landforms



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

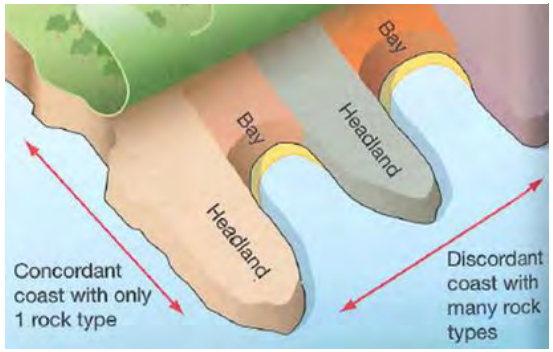
Types of coastline

Concordant

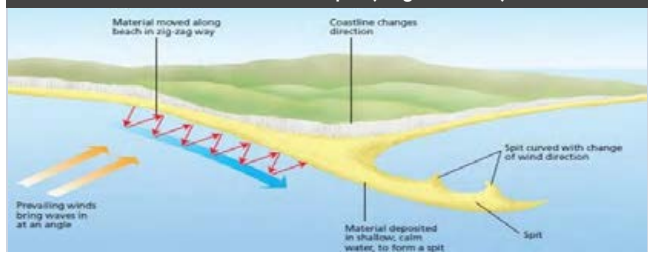
A concordant coastline occurs where the bands of differing rock types run parallel to the coast. The outer hard provides a protective barrier to erosion of the softer rocks further inland. Sometimes the outer hard rock is punctured allowing the sea to erode the softer rocks behind. This creates a cove which is a circular area of water with a relatively narrow entrance way from the sea.

Discordant

Discordant coastline occurs where bands of differing rock type run at right angles to the coast. The different resistance to erosion leads to the formation of headlands and bays.



Formation of coastal spits (longshore drift)



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

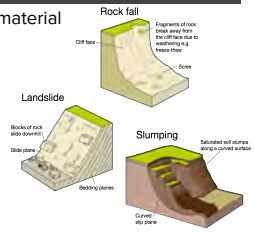
Mass movement

Mass Movement is the downhill movement of cliff material

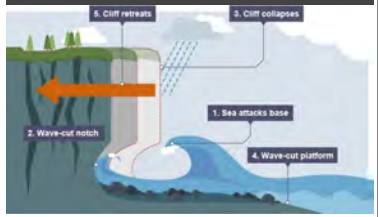
Rockfall As the weathering processes weaken the structure of the cliff rock fragments fall away.

Landslide Large blocks of the cliff slide down to the base of the cliff due to erosion weakening the base of the cliff

Slumping When soft rocks like clay become too wet from rainfall and weakened by erosion, the entire cliff face slips down in a curve, making steps in the cliff



Wave-cut landforms



1. The sea attacks the base of the cliff between the high and low water mark.

2. A wave-cut notch is formed by erosional processes such as abrasion and hydraulic action - this is a dent in the cliff usually at the level of high tide.

3. As the notch increases in size, the cliff becomes unstable and collapses, leading to the retreat of the cliff face.

4. The backwash carries away the eroded material, leaving a wave-cut platform.

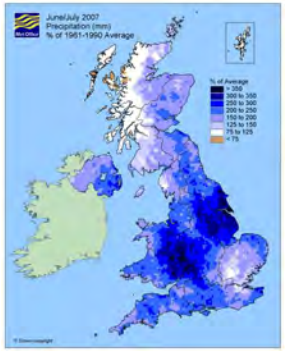
5. The process repeats. The cliff continues to retreat.

1.2.2 - Rates of change

Climate

The rainfall map of the UK shows variations in rain.
Less precipitation occurs in low land areas. East England
Most precipitation occurs in upland areas. Scotland.

These differences mean...
Uplands experience more weathering, erosion and mass movement.



Geology

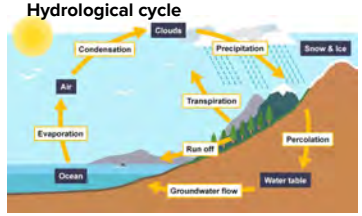
Some rock types erode faster than others (sedimentary limestone or clays erodes quicker than metamorphic granite). The direction rocks are layered in can also affect this eg. concordant or discordant coastlines

Human activity

Humans can increase rates of change such as footpath erosion on cliffs or building on floodplains but humans can also put management in place is slow erosion or transport processes, like dams, groynes, river dredging & afforestation.

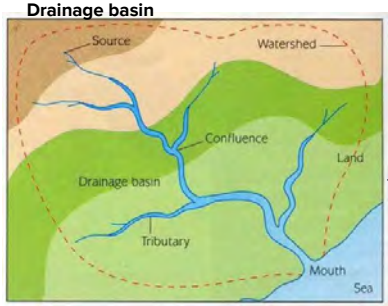
1.3.1 - Drainage basins

Hydrological cycle



Condensation- when water vapour cools to form clouds
Evaporation- where water is turned into water vapour (gas)
Precipitation- any water that falls from the sky (rain, snow etc)
Interception- vegetation traps water before it reaches the ground
Transpiration- water is evaporated from the leaves of vegetation
Surface runoff- water runs across the ground to a river
Infiltration- water seeps into the soil in the ground
Percolation- water seeps into rock deeper in the ground
Groundwater flow- water flows through the soil and rock in the ground

Drainage basin



Drainage Basin- is the area of land drained by a river and its tributaries
Watershed- the area of high land forming the edge of a river basin
Source- where a river begins
Mouth- where a river meets the sea
Tributary- a small river or stream that joins a larger river
Confluence- the point at which two rivers meet
Main river channel- main river flow in the drainage basin
Floodplain- flat land on the sides of the river that takes the overflow water

1.3.2 - River flooding

Factors influencing how rivers flood:

Steep Slopes - If the land surrounding a river is steep, rainfall will run quickly across the ground as surface runoff, increasing the river's discharge

Urbanisation - Roads and pavements are built using a tarmac, an impermeable material. Rainfall flows quickly over tarmaced surfaces as it cannot infiltrate into the ground, leading to rapidly increasing discharge

Geology - If a drainage basin has impermeable rock, water is unable to percolate into the rock. As a result, the rainfall flows into the river via throughflow and surface run off

Heavy or prolonged rainfall - A high volume of rainfall will cause a river's discharge to increase rapidly, increasing the chances of the river bursting its banks

Vegetation - Trees intercept rainfall as it falls from the sky. If there is a lack of vegetation, more rainfall reaches the ground and eventually the river, seeing a large increase in discharge

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1.3.3 - Flood management

Hard Engineering - Hard engineering management involves using artificial structures, such as dams and embankments which try to control rivers. They tend to be expensive.

Soft Engineering - Soft engineering management is a more natural approach to manage flooding, it does not involve building artificial structures, but takes a more sustainable approach to managing the potential for river flooding.

River defences	
Hard Engineering	
Channel straightening	Removing meanders, increases velocity to remove flood water.
Artificial Levees	Man-made banks heighten river so flood water is contained.
Channel widening	Makes river wider to increase capacity for a flood.
Soft Engineering	
Afforestation	Planted trees soak up rainwater, reduces flood risk.
Managed Flooding	Naturally let some areas flood to protect settlements.

Home study questions

DEVELOPING

Describe how tourists can have benefits and negatives to honeypot sites **[3 marks]**

Explain why a waterfall migrates backwards the source **[4 marks]**

SECURING

Analyse the pattern of average precipitation (rainfall) in the UK (1.2.2) **[6 marks]**

Explain the difference between discordant and concordant coastlines **[4 marks]**

MASTERING

'Urbanisation is the most significant factor in flooding' **To what extent** do you agree with this statement? **[8 marks]**

Sketch and annotate the formation of a spit **[6 marks]**

CHALLENGE

Create a spider diagram to show how all the erosional processes and landforms of rivers and coasts are linked

Draw out a river long profile and **label** where the different landforms and processes would usually occur

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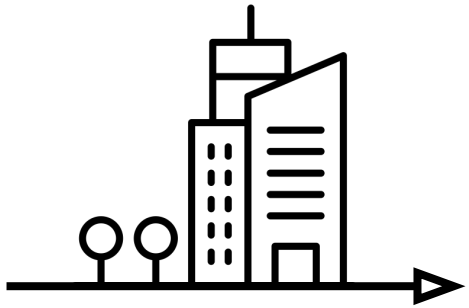
Rural-urban links



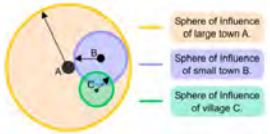
Geography Knowledge Organiser

2.1.1 - Rural-urban continuum

A **rural-urban continuum** is the gradual change from a very built up urban area (like a large city) through to rolling countryside and sparsely populated villages. There is no clear line between urban and rural, as represented by the diagram

Service provision

As we move along the continuum from the most rural to the most urban locations, the number of services provided by each settlement increases. For example, in a small village there is likely to be a post office and a. However, in a large city there are a large number of shops, supermarkets, banks, hospitals and entertainment providers.



A **sphere of influence** is the area around the settlement from which people are attracted to visit or work due to the services the settlement provided. Large cities have more services so have a larger sphere of influence in the area

Counter-urbanisation

The movement of people from urban to rural areas to live.

Reasons for counter-urbanisation:

Housing - cheaper & bigger

Transport - improved roads and increased car ownership

Employment - more workplaces now located on urban-rural fringe

Environmental factors - less noise and air pollution

Impact of counter-urbanisation:

Higher house prices - increased demand

Decrease in traditional services - (village shops) residents now shop in urban areas

Increase need for local schools

Traffic congestion

Commuting - People often choose to live in cheaper rural areas and commute to work rather than paying higher urban prices, or just work from home

2.1.2 - Changing rural areas

Rural change

Counter-urbanisation, sphere of influences and technological change has lead to:

- Reduction or change in employment opportunities in rural area
- Closure of rural services like banks and post offices
- Increase in house prices rural areas, especially in accessible "commuter belt"
- Increased "second" home ownership
- Some locals can no longer afford local houses
- Reduction in bus services

Some of the more remote rural areas have experienced lots of negative changes. These include depopulation and deprivation. Deprivation is often characterised by a lack of public transport, healthcare and education.

Spiral of deprivation

Sustainable rural community

Things that need to be considered when creating a sustainable community;

Availability of jobs – encourage jobs based in rural areas by encouraging more companies to locate there

Education – ensuring local schools remain open

Healthcare – ensure all locals can access healthcare (transport links to cities)

Village services – encouraging shops, pubs and post offices to remain open

Transport – ensuring public transport runs regularly and can be accessed by all

Internet – ensure fast and reliable broadband

2.2.1 - Changing population

UK population change factors

Social

Healthcare - free and accessible for all, so people are living longer

Marriage/culture - People are marrying later and having a family later, reducing the number of children they can have

Economic

Careers - many women now chose to have a career, than start a family

Maternity pay - Getting paid while looking after a newborn child encourages more people to have children

Political

Contraception - is widely available

Mat-/Pat-ernity rights - Mothers and Fathers now have the rights to paid leave to care for a newborn, so encouraging more people to have children

UK migration

Migration to the UK

Stable government
More available jobs
Good healthcare system
Already have family in the UK
Good education system
Better rates of pay

Migration within the UK

Cost of housing cheaper somewhere else
Change in lifestyle - retiring to a rural area
Searching for work - more jobs in a cities
Moving to reduce the commuting time - live closer to work
Moving closer to family for care needs

UK's ageing population

Causes

Low birth rate and low death rate means we have more people living for longer (high life expectancy). The UK now have more people aged 60+ than ever before

Social/Health effects

- OAPs have more health issues, straining NHS
- Increased demand for care homes and carer services
- More people living longer increases demand for homes

Economic effects

- Not enough working aged population to pay taxes
- Healthcare, free public transport etc costs the state more money
- Pension costs for government increases

2.2.2 - UK towns and cities

Egan's wheel

Egan's wheel outlines the criteria that needs to be met for a community to be sustainable. There is a social, economic and environmental focus. All of these categories must be met in order to have a sustainable community in urban and rural places.

Greenfield development

Greenfield sites are those that have not been built on before.

They are easier and cheaper to build on as there's nothing to knock down and there's more land available.

But this isn't sustainable as it is destroying the natural environment and animal habitats.

Brownfield development

Brownfield sites are those that have been built on before and is often derelict.

Planning permission is often easy to obtain and there are already existing services.

This is a more sustainable method of development however space is often limited and it can be expensive.

2.2.3 - Changing retail

Retail change in the UK

Economic factors

More home delivery firms making deliveries cheaper, congestion in cities, free parking in out of town centres, high city centre parking costs

Cultural factors

Car dependant society, habit of bulk buying weekly or monthly shops

Technological factors

Development of high speed broadband, improved websites that can be used to compare prices, internet banking

Out of town centres

Benefits	Costs
Large free parking areas	Can cause decline in city centre
Less congestion at out of town location	Can increase congestion out of town
Quick and easy access (near motorway network)	Often has the same chain stores at out of town centres – so does not support smaller independent shops.
Often room for expansion	Land use conflicts in out of town areas – areas in high demand from business parks and golf courses
Near suburban housing	

Internet shopping

Benefits	Costs
Convenient and often cheaper	Not everyone, (the elderly) have internet
Can buy products not available locally	Goods might be difficult to return
Can buy at any time or any location	City centre shops might close, leads to jobs losses and decline
Less time consuming	More delivery vans = more congestion
Traffic congestion is reduced	Using bank details can lead to fraud
Jobs created for those delivering products	

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2.3.1 - Global urbanisation

Distribution of global cities

As a result of globalisation, places around the world are now more connected than ever before. **Global cities** have become key globally connected places.

Although global cities are distributed widely across the world it is not an even distribution. For example;

- North America, Western Europe and South Asia have clusters of global cities
- Africa has very few
- India has 8
- China has 14

Changes over time

The rate of urbanisation varies across the world. In many HICs the period of rapid urbanisation occurred back in the 1800s, whereas many LICs are experiencing it at the moment.

2.3.2 - Urbanisation in global cities

London (HIC global city)

Reasons for growth

Natural population change – from the migrants and young workers who were attracted to the city for work

Migration – the UK attracted many from ex-colonies as well as people from other EU countries

Connections – London is the financial capital of UK and for most of the global finances too. It has the stock exchange. It is also home to large MNCs. London is also a major trading and transport hub.

Way of Life

The UK has huge numbers of cultures and races, as well as white British people there are huge numbers of migrants from India, Pakistan, Bangladesh, Canada, USA, Kenya, Zimbabwe and other ex-British colonies

London houses a major world financial centre and a range of business specialisms which attract a highly skilled workforce.

However London's unemployment rate was one of the highest in the UK

Challenges

Poverty

Often people who live in inner-city areas experience a poor quality of life. This is because the inner-city is typically a zone with older housing and declining industry. There is a lack of housing provision; access to services; access to open land;safety and security.

Traffic Issues

London has massive problems with congestion. From the 1950s, car ownership has grown at a very quick rate. The increasing population of the city has meant roads are crowded and transport services such as the underground and buses struggle to cope

Urban decline

Some areas of a London suffers from out-migration of people and businesses, derelict buildings, high unemployment. This was common in the inner cities of the UK in the 1980s, leading to further poverty in these areas.

Mumbai (NIC global city)

Reasons for growth

Natural population change – in 1974 the fertility rate was 4, although this has now reduced to 1.8. Natural change was therefore a big factor in the 1970's and 1980s but less so now.

Migration – the pull factors for Mumbai are cheap rail travel, jobs and better education. The push factors from the surrounding countryside are poor standards of housing, healthcare and sanitation.

Connections – Mumbai is the financial capital of India and home to the stock exchange. It is also home to large MNCs.

Way of Life

Mumbai is a city of contrasts. One obvious one is the difference between rich and poor. Many well education people live in expensive properties while the majority of the city live in slums and work in the informal economy (in roles such as street vendors and rubbish collectors)

In the slims there is a lack of sanitation, adequate housing and open sewers are just some of the issues that face people living in these areas. Disease often spreads quickly due to the conditions and lack of health care facilities.

Informal sector

Wages are low = families unable to save and cannot afford to send children to school = children fail to get an education and forced to work in informal sector

Informal workers don't pay tax = government does not raise income and cannot afford to invest in schools or hospitals = **children fail to gain a good education** and forced to work in the informal sector.

Challenges

Reducing poverty and deprivation – with such a large proportion of people living in slums. Education opportunities for these people are being increased, in addition to improved healthcare and sanitation.

Housing – the majority of people live in slums, are pavement dwellers or live in crawls (four or five story tenement buildings with shared facilities). These areas suffer from overcrowding and the risk of fire, flooding or collapse.

1.3.3 - Connected global cities

Global Cities are connected to each other and other places around the world by:

Finance and Trade - global cities are the world's financial centres as banks locate their head offices in these cities and decisions regarding world trade are made here. This makes them very important places for the economy.

Migration and Culture - global cities attract economic migrants from all over the world. This pattern of migration results in cultural diversity which means that new languages, traditions, foods, celebrations and religions are brought to the country. For example in London over 250 languages are spoken.

Governance and Decision-Making - global cities are home to some of the most influential businesses and companies in the world where decisions made can influence the rest of the globe. For example the UN has headquarters in New York and yet employs 41,000 people worldwide.

Ideas and Information - global cities are home to many of the world's largest television and film industries, broadcasting all across the globe.

Transport Hubs - global cities are home to some of the world's largest airports which allow for the movement of people, goods and tourists across the globe. For example about 158 flights arrive at Dubai International Airport.

Home study questions

DEVELOPING

Define what an rural-urban continuum is **[2 marks]**

Explain how the spiral of deprivation leads to depopulation **[4 marks]**

SECURING

Analyse the distribution in global cities around the world (2.3.1) **[6 marks]**

Explain why building on brownfield sites is more sustainable than on greenfield sites **[4 marks]**

MASTERING

'The challenges associated with an NIC global city are more difficult to solve than those of HIC global cities' **To what extent** do you agree with this statement? **[8 marks]**

Decide why Europe and North America has the most significant concentration of global cities **[6 marks]**

CHALLENGE

Link greenfield and brownfield developments to as many different elements of this module as possible

Create a spider diagram to show how Newcastle is linked to the rest of the world (a connected global city)

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Tectonic hazards

Geography Knowledge Organiser

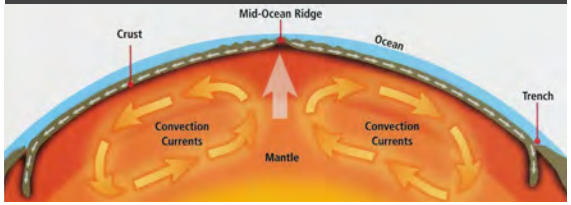
3.1.1 - Tectonic processes and landforms

Tectonic plates

The earth is made up of a series of layers. The outer layer is called the crust. This is made of 2 different types:

Continental Crust (which is on average 35km thick)
Oceanic Crust (which is much thinner, between 6-8km)

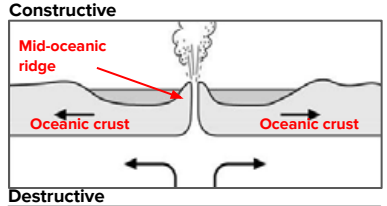
Convection currents



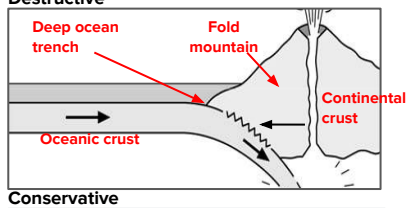
Heat from the core causes **convection currents** in the mantle and these currents slowly move the plates

Tectonic boundaries

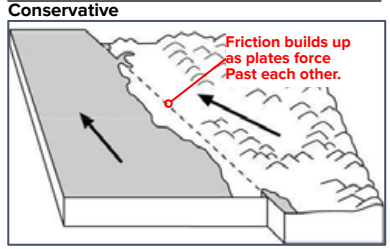
Constructive



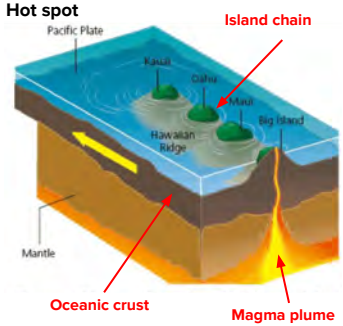
Destructive



Conservative



Hot spot



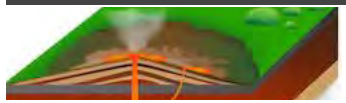
1. Intense radioactivity in the Earth's interior creates a large column of magma (known as a magma plume)

2. The plume rises, melting and pushing through the crust above

3. The plume lies in a fixed position under the plate – as the plate move over it, a series of new volcanoes are created along the plate

3.1.1 - Tectonic processes and landforms

Volcanic landforms



Shield volcano characteristic
Low profile
Wide base
Thin runny lava
Made up of layers of lava
Frequent and gentle eruptions

Stratovolcano characteristic
High profile
Narrow base
Thick, slow lava
Made up of layers of mainly ash
Infrequent and violent eruptions

Feature	How it is formed	Found at
Ocean trench	Where subduction takes place	Destructive
Fold mountain	Continental crust is crushed and folded upwards	Destructive
Ocean ridge	As lava cools a ridge is formed under the sea	Constructive
Rift valley	Where 2 continental plates pull apart	Constructive
Caldera	A large depression or crater formed by large stratovolcanoes or supervolcanoes	Destructive & hotspot
Cinder cone	Bowl shaped crater of a shield volcano	Constructive
Lava tube	Under the ground, basic lava develops a hard crust through which lava flows	Constructive
Geysers	Water in the ground heated by the magma explodes onto the surface	Destructive & hotspot

3.2.1 - Tectonic impacts

Volcano effects

MONTSERRAT 1995-7

Health
- Ash clouds caused breathing problems
- 19 deaths
- 100s injured

Infrastructure
- The capital, Plymouth, has been covered in layers of ash and mud
- Lahars have destroyed large areas urban areas
- The only airport was destroyed

Economy
- Farmland abandoned (significant unemployment)
- Prevented tourism so tourism economy suffered
- Capital city is abandoned and rebuilt in the north

Earthquake effects

HAITI 2010

Health
- 250,000 people died.
- 300,000 people were injured.
- Cholera spread through temporary camps

Infrastructure
- Airport and port damaged
- 30,000 buildings collapsed
- Hospitals and medical centres were destroyed

Economy
- Damage to the main clothing industry
- Tourist industry will take years to recover
- Infrastructure damaged reduced trade, imports and exports

Tsunami effects

SOUTHEAST ASIA 2004

Health
- Over 220 000 deaths
- 650 000 injured
- 5-6 million needing emergency aid

Infrastructure
- 1,000s of railway lines, roads, bridges and airports were destroyed
- Hospitals within 30mi of the coastline were destroyed
- Water supplies contaminated

Economy
- Fishing industry devastated
- Tourism, dropped 80%
- Reconstruction cost billions of pounds

Vulnerability to tectonic hazards

Physical factors

Duration - the longer a hazard lasts the more severe the impact
Predictability -hazards that hit with no warning have a larger impact

Volcanoes

Lava flows - Molten rock flows down the side of a volcano (Local)
Lahars - Volcanic mudflows consisting of a mixture of ash and water (Local)
Pyroclastic flow - Burning clouds of gas and ash (Local)
Ash clouds - Ash thrown into the atmosphere (Regional/National/Global)

Earthquakes

Magnitude - the stronger the hazard the more severe the impacts

Human factors

Wealth - poor people are less able to withstand disasters and recover from it
Education - where populations are able to read and write, written messages can be used to spread warning or give advice about how to cope
Governments - can support education and and can pass building regulations
Age - children and the elderly are more vulnerable
Health - healthy people are more able to cope
Population density - the more people living in the area the more that will be affected
Time of the day - e.g. earthquakes in rush hours have a more devastating effect
Emergency services - richer countries have well trained and well resourced response

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3 . 2 . 2 - Tectonic management

Earthquakes are difficult to predict but there are some monitoring techniques:
- Laser beams can detect plate movement
- A seismometer is used to pick up vibrations in the earth's crust. These can lead up to an earthquake

Monitoring Techniques used to predict volcanic eruptions include:
- Remote sensing. Satellites monitor gas emissions and thermal imaging can work out the temperature within the volcano.
- Seismometers can pick up movements in the earth which sometimes occur before an eruption.

Tsunami warning system:
- Following the 1960 Chilean earthquake the Pacific countries decided to set up the Pacific Tsunami Warning System (PTWS).
- This is a network of seismometers and ocean buoys that detect earthquakes and ocean movements.
- Warnings are then given to local centres, which warn local people using the TV, radio, text messages and sirens.

Hazard planning strategies

Hazard Mapping highlights areas affected by or vulnerable to earthquakes, volcanoes and tsunamis so planning and money can be targeted at these areas
New building technology can also reduce the impact of earthquakes. Often they are built to absorb the energy and withstand the earth's movement
Emergency planning:

- An exclusion zone can be set up around a volcano
- Lava flows can be diverted
- Emergency services can be trained and given the equipment needed
- People put together emergency kits which include first aid items, blankets etc.

Home study questions

DEVELOPING

Describe how a hot spot creates island arcs **[2 marks]**

Compare the differences between shield volcanoes and stratovolcanoes **[4 marks]**

SECURING

Analyse the distribution of the 3 different plate boundaries around the world (3 . 1 . 1) **[6 marks]**

Explain how tsunamis impact the health and infrastructure of a country **[6 marks]**

MASTERING

'Human vulnerabilities are responsible for more deaths than the physical risks associated with tectonic hazards' **To what extent** do you agree with this statement? **[8 marks]**

Explain how tectonic hazards are managed **[4 marks]**

CHALLENGE

Research the responses to the 3 hazard case studies (Montserrat, Haiti and SE Asia) and add these to the space below

Explain how tsunamis are a secondary effect of earthquakes

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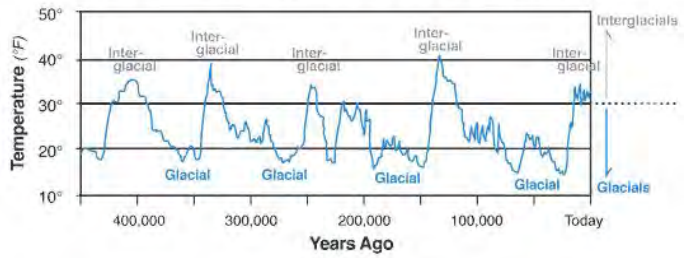
Weather, climate and ecosystems

Geography Knowledge Organiser

5.1.1 - Climate change evidence

Climate Change during the Quaternary Period



Over a long period of time (the last 400,000 years) there have been natural cycles of cooling and warming. The periods of time the average global temperature was below 15°C are known as **glacials**, and periods of warmth are known as **interglacials**.

Evidence for climate change

Ice cores from the Antarctic show the amount of CO_2 and methane in the atmosphere have changed over the last 420,000 years

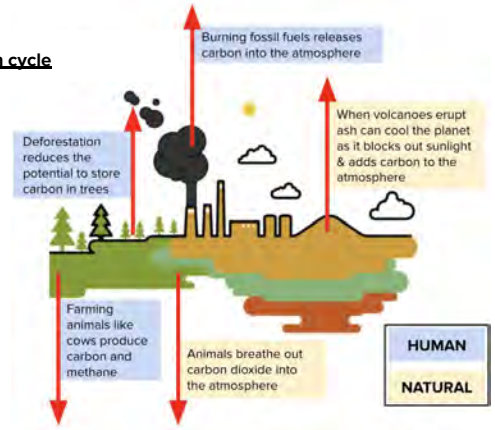
Historical records, such as diary extracts

CO_2 levels in the atmosphere

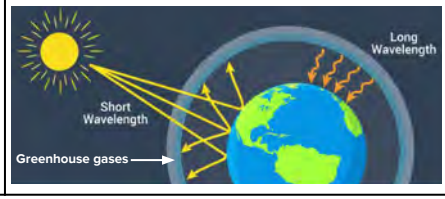
Measurements by the met office show temperature has increased by 0.6°C over the past 100 years.

5.1.2 - Climate change causes

Carbon cycle



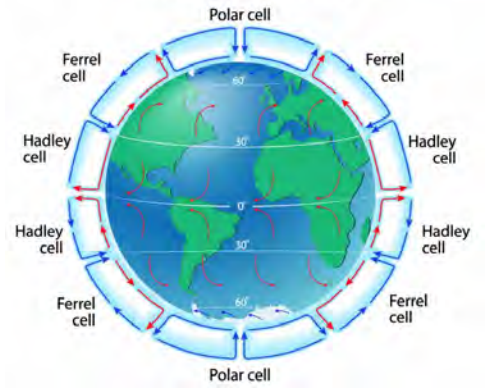
Greenhouse effect



The greenhouse effect is natural but humans have worsened the impacts. Carbon Dioxide and Methane are greenhouse gases which trap heat in the atmosphere. As more gases build up more heat is stored, warming the planet.

5.2.1 - Weather hazards

Global circulation



1. At the equator insolation heats the Earth which heats the air above

2. Hot air rises creating low pressure – as it rises it travels north and south

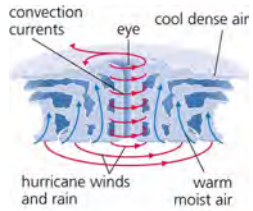
3. This air eventually cools and sinks at about 30° north/south of the equator – this creates high pressure

4. This air then returns to the equator (known as the intertropical convergence zone ITCZ)

Low pressure & tropical storms

Warm air rises because it is less dense. When it reaches the edge of the atmosphere it cannot rise any further and moves north and south. The edge of the atmosphere is cold and so the air cools too. Low pressure can create a hazard called a tropical storm, which is also known as a hurricane, cyclone or typhoon

Tropical storm cross section



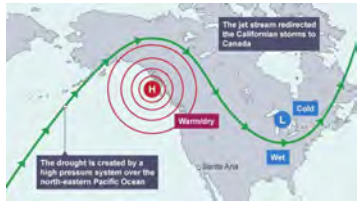
Tropical storm causes (CYCLONE PAM 2015)
Occurred near the island chain of Vanuatu in the South Pacific
Tropical storms can only form over large/deep oceans
Ocean temperatures of at least 27°c
Water depth of at least 50 meters
Gentle winds in the atmosphere to draw air up from water surface

Tropical storm effects (CYCLONE PAM 2015)
11 people died
90000 homeless
Hospitals and schools destroyed
Widespread destruction of fruits, vegetables, root crops and livestock
Stormsurge flooded coastal areas and contaminated freshwater supplies

Tropical storm responses (CYCLONE PAM 2015)
Emergency aid sent by Australia, Fiji, New Zealand and UK
153 temporary school built
Repairs to infrastructure to provide safe drinking water
Blankets & tents given to those made homeless
28 schools used as evacuation centres

High pressure & droughts

As the air cools in the outer atmosphere it becomes heavier and starts to sink. This air moves back to the ground. This is called high pressure. As the air reaches the surface it starts to warm again and the cycle continues. High pressure can produce a hazard called a drought - a long period of no available water due to intense heat.



Drought causes (CALIFORNIA 2012)
The jet stream was further north that normal, pushing low pressure systems north and allowing high pressure systems to sit over the state creating a heat wave.

Drought effects (CALIFORNIA 2012)
A hosepipe ban was introduced
Homes were destroyed by wildfires
Hydroelectric power dams stopped producing electricity
Crops could not be grown and 17,000 agriculture jobs were lost
Fish died as high temps caused an oxygen decrease

Drought responses (California 2012)
12,500 water metres installed in homes
400,000 water saving toilets installed
3.2 million square feet of turf removed.
50% of Orange County's water supply is now imported from other areas.

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5.2.2 - UK weather variations

Weather - the conditions of the atmosphere over a short period of time, often a day
Climate - the weather of a place averaged over a period of time, often 30 years

Factors affecting Climate in the UK

Latitude –the north of the UK has cooler temperatures than the south
Altitude – mountain areas have cooler temperatures. Temperatures decrease by 1°C for every 200m of elevation.
Ocean currents – the North Atlantic drift brings warmer water to the UK, keeping the climate milder in winter and cooler in summer.
Different winds directions also bring different **air masses**:

- **Pm** North westerly brings polar maritime air (cool and showery)
- **Tm** South westerly brings tropical maritime (mild and wet)
- **Pc** Easterly brings polar continental (cold and dry)
- **Tc** South easterly brings tropical continental (warm and dry)
- **Am** Northerly brings arctic air (cold and snow in winter)

Low Pressure (depressions)
Begin in the Atlantic and move east

Brings rain, cloud and wind

Air rises, cools and condenses forming clouds

High Pressure (anticyclone)
Low wind speed, stable conditions with no clouds

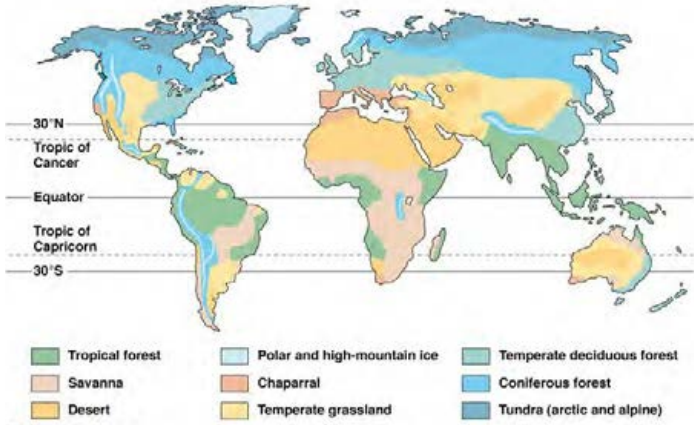
In summer they bring hot weather, which may lead to drought

In winter they bring cold (frosty) nights

Microclimate

Physical features - hills, trees can block the wind and sun. Water cools the air
Shelter - Buildings, trees and hills can shelter from the wind
Surface (albedo) - dark surfaces heat up quicker than light surfaces
Buildings - Buildings store up heat and redirect wind direction
Aspect - locations facing south have sun all day, the north doesn't receive sunlight

5.3.1 - Ecosystems



Large scale **ecosystems** are known as **biomes**.

Climate – the most important factor in determining their distribution
Rainfall – the amount and patterns determine the distribution of biomes
Temperature – when rainfall is reliable and distributed evenly temperature becomes the most important factor

Other factors can also have an influence e.g.
Tropical rainforests are located either side of the equator where hot and wet conditions allow continuous growth of plants

5.3.2 - Ecosystem processes

Tropical rainforest characteristics

Shrub layer. It is dark and gloomy with very little vegetation.
Under canopy. It is the second level up. There is limited sunlight. Saplings wait here for larger plants and trees to die
Canopy. This is where the upper parts of most of the trees are found. The canopy is typically about 65 to 130 feet (20 to 40 metres) tall.
Emergents. These are the tops of the tallest trees in the rainforest. These are much higher, and so are able to get more light than the average trees in the forest canopy.

Nutrient cycle

The rainforest nutrient cycling is rapid. The hot, damp conditions on the forest floor allow for the rapid decomposition of dead plant material. This provides plentiful nutrients that are easily absorbed by plant roots.

Water cycle

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

Carbon cycle

Rainforests contain about 40 to 50% of the carbon in the biomass, and very little in the soil due to the rapid nutrient cycling

Key services

Regulating climate and air quality
Preventing Soil Erosion
Carbon Storage
Provisioning Goods (food, fuel)
Flood prevention

Biodiversity

Biodiversity is the variety of plant and animal life in a particular habitat, a high level of which is considered to be important and desirable. The tropical rainforest has a higher level of biodiversity than savannah

5.3.2 - Ecosystem processes

Savanna characteristics

Grasses and trees - The savanna is a grassland with scattered trees and shrubs.
Rainy and dry seasons - Savannas have two distinct seasons in regards to precipitation. There is a rainy season in the summer with around 15 to 25 inches of rain and a dry season in the winter when only a couple of inches of rain may fall.
Large herds of animals - There are often large herds of grazing animals on the savanna that thrive on the abundance of grass and trees.
Warm - The savanna stays pretty warm all year.

Nutrient cycle

Nutrients are cycled quicky during the dry season in the tropical heat. Wildfires are common and nutrients are returned to the soil when vegetation burns.

Water cycle

All most all rain falls during the rainy season. Vegetation quickly absorbs and stores this water for the dry season. Little water is lost by transpiration due to waxy leaves and low surface area of the plants.

Carbon cycle

Majority of carbon is stored in vegetation with a lesser amount in soil. During dry seasons, wildfires can burn vegetation, releasing CO_2 into the atmosphere.

Key services

Preventing Soil Erosion
Carbon Storage
Provisioning Goods (food, fuel)

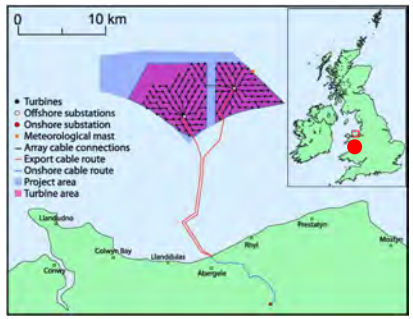
Small scale ecosystem: sand dunes

Sand Dunes are a build up of sand around vegetation. This requires loose sand and prevailing winds which blow on-shore. They are formed through a processes known as succession. As plants die and decompose it nourishes the soil making it better quality and now more fragile plants will start to grow.

5.4.1 - Human uses

Gwynt y Môr offshore wind farm
Offshore wind farms are located in the sea close to the shoreline as winds are stronger, unobstructed and do not impose on cities/population as much. Gwynt y Môr is located 15km off the north coast of Wales

The demand for renewable energy is increasing as non-renewables such as coal and gas are depleting



Advantages	Disadvantages
Produces power for 400,000 homes	RSPB says it affects bird migrations and their normal routines
Creates 100+ jobs	National Trust has concerns over affecting heritage and tourism
Helps with global climate change efforts	Locals are opposed as it spoils the natural beauty

5.4.2 - Human impacts

Tropical rainforest uses

Advantages:
Infrastructure, hospitals and education can be improved
Raw materials, eg tropical hardwoods such as ebony and mahogany, can be sold for a good price abroad.
Large-scale farming brings money into the country and provides food and jobs.
Small-scale farming provides food for rainforest communities.

Disadvantages:
Land clearance for farming, transportation and mining can lead to **deforestation.**
Loss of fertile soils that make farming possible are quickly washed away when the forest is cleared.
Loss of animal habitat occurs when trees are cut down. Hence, deforestation can result in endangering animals and plant life, or even causing them to become extinct.

Savanna uses

Advantages:
Small-scale farming provides food for rainforest communities.
Raw materials, eg fuel (firewood)

Disadvantages:
Large areas of grassland have been turned into **farmlands** for growing crops and for rearing cattle.
Animals have been **hunted** for their valuable body parts or for sport.
Loss of fertile soils that make farming possible are quickly washed away when the forest is cleared.

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5.4.3 - Ecosystem management

Tropical rainforest management

Selective logging – only cutting down older trees and not rare species. The International Forest Stewardship Council makes people aware of products made from sustainable timber.

Agro-forestry – growing new trees alongside crops

Wildlife corridors – connecting separated areas of forest with strips of vegetation so animals can move between areas

Eco-tourism – encouraging small groups of sustainable tourism. Money made is used to protect the ecosystem and uses local tour guides and companies.

Debt-swaps – HICs cancel debts which LICs have, if they protect their rainforests from over-exploitation

Savanna management

Crop rotation – growing different crops and giving the land time to rest between planting to allow soil to recover nutrients

Afforestation – planting more trees to protect the soil

Drought-resistant crops – Planting genetically modified crops which can withstand long periods of water shortage

Population control – Encouraging people to have fewer children so less crops and water are needed in the area

Home study questions

DEVELOPING

Describe the economic effects of a low pressure hazard **[3 marks]**

Give three ways that humans have influenced the carbon cycle **[3 marks]**

SECURING

Analyse the pattern of temperature change over the last 450 million years (5.1.1) **[6 marks]**

Explain how low pressure systems forms **[3 marks]**

MASTERING

Discuss how sustainable the use of one ecosystem is **[8 marks]**

Explain the factors that influence changes in weather for the UK **[6 marks]**

CHALLENGE

Decide how deforestation would affect the nutrient, water and carbon cycles in the tropical rainforest - present your decision as a paragraph or concept map

Evaluate how successful you think management strategies for the savanna ecosystems are

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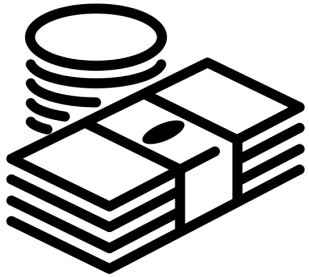
SCAN ME

Development and resource issues



Geography Knowledge Organiser

6.1.1 - Measuring development

Measures of development

Gross domestic product (GDP) - the total value of all goods and services produced within a country
Gross National Income (GNI) - (per capita) average wage per person
Employment structure - the type of work people do (for example, primary, secondary, tertiary)
Poverty - the % of the population that earn less than $1.90 a day

Limitations of these measures
They only measure wealth and not social factors (like life expectancy)
They do not show inequality in country (gap between rich and poor)
They do not show the cost of living (ie. the amount that can be bought with the average wage)

Development continuum

A development gap exists between richer and poorer countries. The "Brandt" line splits the world into more developed "global north" countries and less developed "global south" countries.

However, the Brandt line is a bit too simplistic. In reality there is a "**development continuum**". This is a sliding scale from super rich countries to the very poor. The World Bank splits countries into 4 categories based on their Gross National Income (GNI):
HICs with GNI of $12,736 or above
Upper Middle Countries with GNI between $4126 and $12735
Lower middle countries with GNI of $1046 to $4125
LICs with GNI of $1045 or less

6.2.1 - Uneven development

Causes of uneven development

Trade involves buying goods from other countries (imports) and selling them (exports)
HICs generally export valuable goods such as electronics, cars and financial products. They import cheaper primary products like tea, sugar and coffee.
LICS do the opposite. This means they earn little and remain in poverty

The prices of these products go up and down but HICs tend to have the biggest influence over them. LICs lose out when the price drops, but have little control over it. Increasing this trade and changing the balance of imports/exports is essential for LICs to develop. Some HICs impose tariffs (import costs) and quotas (a limit to the amount of imports) which also affects LICs.

Multinational corporations (MNCs)

MNCs have grown as a result of globalisation. Often they are free to decide where they locate many aspects of their company. The headquarters if usually found in a global city such as London. However, other parts of the company can be located around the world. Factors like, government incentives, location of raw materials, labour costs and reduced costs for buildings and land make a difference.

Advantages of MNCs in LICs	Disadvantages of MNCs in LICs
Created jobs and improved local skills	Investment could be transferred to other countries quickly
Pays higher wages than most local Companies	They has large demand for energy/water
Helped attract more MNCs	They have reputation for workers abuse
Contributes to tax which helped pay for schools, hospitals etc.	They might undermine national culture

6.2.1 - Uneven development

Tourism

As a result of globalisation the tourist industry has grown rapidly. It now accounts for 1-in-11 jobs worldwide. It is increasingly becoming important for low and middle income countries. Rapid growth is due to:
Early retirement & higher life expectancy mean people can spend time travelling
People earn more so have more disposable income
Modern aircraft make is cheaper and quicker
The internet allows people to research destinations

Mass tourism
Where tens of thousands of people going to the same resort often at the same time of year

Enclave tourism
Where tourists pay one price and get all travel, accommodation, food and drink in one place

Cruise holidays
Cruise ships sell all inclusive packages

Advantages of tourism in LICs	Disadvantages of tourism in LICs
Employs thousands directly and hundreds of thousands indirectly, bringing billions to the economy	Many tourist development are partly owned by foreign companies. Some profits leak (send) overseas
Tourism is encouraging new skills and improving language skills of locals	Jobs are seasonal, many people lose their jobs in the wet or winter season
New services such as transport can be used by tourists and locals	The growth of sex tourism can become an issue in some countries
New national parks are being created to protect wildlife and encourage tourism	The arrival of tourists can cause a decline in local cultures, for example loss of language or religious traditions

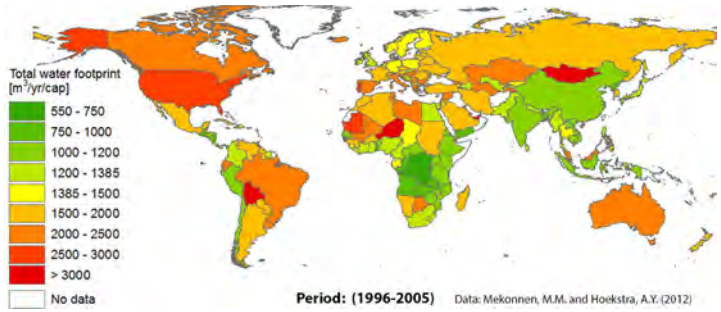
6.2.2 - Managing development

Aid

Aid is the transfer of resources from a richer country to a poorer country. Different types of aid include:
Bilateral aid – between two countries
Multilateral aid – money donated by richer countries via organisations such as the UN
Short term emergency aid – immediate relief following a natural disaster
Long term development aid – a sustained programme of aid which aims to improve the standard of living
Debt abolition – when richer countries cancel debt owed by poorer countries
Aid from non-governmental organisations (NGO's) – given through charities such as Oxfam.

Advantages of aid for LICs	Disadvantages of aid for LICs
Emergency aid saves lives and reduces misery	Aid can increase dependency on the donor country
Development aid can lead to long term improvements and increase standards of living	Profits from the large projects can go to multinationals and donor countries
Assistance in developing natural resources benefits global economy	Aid doesn't always reach the people who need it and can be kept by corrupt officials
Aid for industrial development creates jobs and aid for agriculture increases food supply	Aid can be spent on prestige projects in urban areas rather than in the areas of real need
Provision of medical training and supplies improves health	Aid can be used as a weapon to exert political pressure on the receiving country

6.3.1 - Water demand



The global consumption of water is rising. This is because:
Population is rising
Economic development - The more developed a nation the more water used
Increased need by agriculture - irrigating crops
Industrial growth - As more MNCs invest in NICs and LICs the more water needed
Consumerism - HICs use appliances like dishwashers and washing machines

Water footprint - a measure of humanity's use of fresh water and/or polluted
We don't just use water to drink and for hygiene reasons. 70% of our water is used to produce food (crops & animals). Industries use water in 'cooling processes'. Water is need in thing like clothing - fabrics have to be grown.

Water security - the capacity to safeguard the sustainable availability and access to drinking water
The UK generally have excellent access to water all year round. Some places don't, where water isn't clean or alway available. Sometimes it's too expensive to transport or access (economic scarcity) or it's not available due to droughts (physical scarcity).

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6.3.2 - Water sustainability

Dams: Dams block the flow of a river, creating a large reservoir to the rear which can be used all year round. Dams can be expensive to build, and the reservoir may flood local settlements and ecosystems.

Water transfers: When water is transferred to from an area that has a surplus of water to an area that is experiencing a shortage. This may be conducted within a country, but it can also be conducted from one country to another. For example, Lesotho transfers water to areas of South Africa experiencing physical water scarcity.

Desalination plants: Desalination is the process by which salt is extracted from water. At these plants, salt is removed from seawater to make it safe to drink. Such plants are extremely expensive to run.

Water conservation: This is when an attempt is made to actually use less water in the first instance. For example, many toilets have dual-flush systems to reduce the amount of water used. In addition, meters may be installed within households so residents can check their water usage

Over-abstraction of groundwater

India is a country that is over extracting its groundwater (the water table is 4m lower than in 2000)

Reasons for this
Some states like Gujarat have a long dry season
Surface stores (like reservoirs) are often polluted
Cheap electricity has encouraged farmers to dig deeper wells

Solutions
The government can build more dams (this is an example of top down development)
Farmers could be encouraged to conserve water e.g. rainwater harvesting (this is bottom up development)

6.4.1 - NIC regional development

India's regional patterns

Northeast has higher levels of poverty (over 30% of people)

South has the least levels of poverty (less than 10%)

The east generally has lower levels of poverty (around 15%)

GDP per region in India

Physical reasons

Northern India is more mountainous and dry, so it has poor soil and climate to grow crops. **The south** has a more humid climate with rains.

Political reasons

Kerala (in the south) funds education and encourages families to have fewer children = better quality of life (less pressure on resources)
Kashmir (in the north) has seen conflicts/wars and is in a mountainous area = not very populated, poor access, dry climate.
Maharashtra (in the east) has the capital city and attracts lots of industries like manufacturing and has ports for trade

Cultural reasons

India had a **caste system** (some people had more rights than others). Although it's illegal now it still has an impact on people today with types of jobs people can do.

Girls and women are discriminated against particularly in rural areas

6.4.2 - UK regional development

UK's regional patterns

There is a north-south divide in the UK for development. The divide recognises the social and economic differences between Southern parts of the UK (more developed) and the rest of the UK (less developed).

Economic reasons

With the l**argest markets located in the south-east,** which also includes **good access to European markets**, companies have greatest potential to **maximise profits by locating in the south**.

Social reasons

With over 20 million people of the UK's population living within a one hour commute of London, many **businesses prefer to locate themselves close to their customers**, and within **commuting distance of their staff.**
Many universities are in the south of the UK, including Oxford and Cambridge, which provide many workers - who **employers may perceive as being most skilled** and desirable.

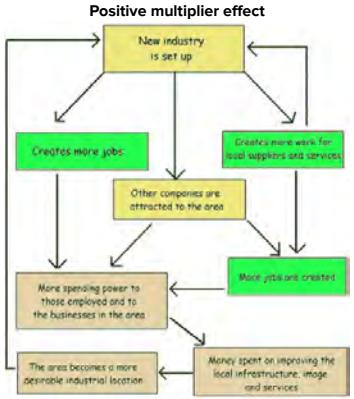
Political reasons

Many large companies have headquarters (HQ) in the south-east, making it easier to make crucial decisions. Even though government policy has tried to encourage investment in other parts of the UK it is **still more convenient for other smaller businesses to start up where there is already infrastructure** to support.

6.4.3 - Managing UK development

Positive multiplier effect

Regional inequality can be reduced by investment in deprived areas of the UK. Various strategies have been used in the past which usually includes investing in infrastructure in an area which is deprived to try and promote a **positive multiplier effect**. However, when industries close there is also a **negative multiplier effect**.



National strategies

Giving power to local authorities e.g. regional mayors (Manchester/Leeds)

The **creation of the "Northern Powerhouse**" which is a proposal to boost economic growth in the North of UK, this would attract investment and create skilled jobs in the area

The **improvement of transport links** to the Northern places in the UK. This improves accessibility, attract new investment and therefore may create a positive multiplier effect (eg. HS2)

Relocation of major business and offices, sometimes head offices in other parts of the UK, such as Manchester. This encourages other businesses to invest in the areas

Local strategies (Newcastle)

Newcastle Enterprise Package - supporting new business

Newcastle Science City - a partnership between Newcastle University, Newcastle City Council and the European Regional Development Fund supporting the innovation and technology sectors

The Millennium Bridge - crossing the river Tyne

Home study questions

DEVELOPING

Outline the measures of economic development **[3 marks]**

Give three reasons why LICs receive less money from international trade **[3 marks]**

SECURING

Analyse the pattern of global water usage (water footprint) (6.3.1) **[6 marks]**

Describe what a water footprint is **[2 marks]**

MASTERING

Evaluate which factor/reason (social, economic or political) is the most significant cause of UK regional inequality **[8 marks]**

Decided whether foreign aid is overall a good or bad thing for LIC development **[8 marks]**

CHALLENGE

Create a concept map to show how MNCs and tourism are linked and how these are also linked to uneven development in LICs/NICs

Research how the High Speed railway 2 (HS2) project will have benefits for the north of England

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Find a playlist of explainer clips by scanning or clicking the QR code

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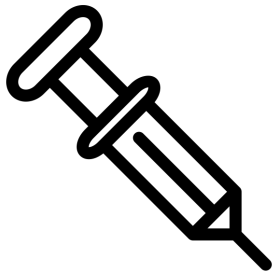
Social development



Geography Knowledge Organiser

7.1.1 - Measuring development

Measures of social development

Life expectancy - The average age a person is expected to live
Literacy rates - % of people in a population that can read or write
Infant mortality rate - Number of babies per 100 live births who die under the age of 1
Average number of people per doctor
Average food (calorie) consumption
Number of homeless people
Deaths from unsafe water and sanitation

Measures of gender development

Gender equality is ways in which a country can be measured through social development. So a comparison between genders is useful, such as:

- **Fertility rate** – The average number of births to a woman in her lifetime
- **Male/female literacy rates**
- **Male/Female life expectancy**
- **Male/female food consumption**
- **Male/female employment rate**
- **Gender development index (GDI)** - measures gender inequalities in three key aspects: *reproductive health, empowerment and economic status*

Human development index (HDI)

A measure of the development in a country taking into account wealth, education and average life expectancy. The human development index (HDI) is calculated from four development indicators and measures a country's progress across a range of factors:

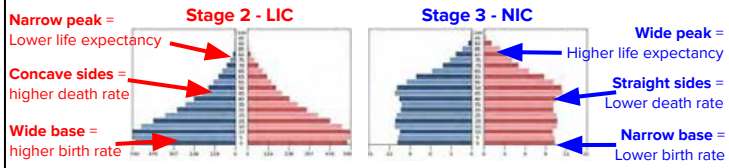
- **Average length of schooling in years**
- **Literacy rates**
- **Gross national income (GNI)** - The average income in a country per person

7.2.1 - Development issues in Africa and Asia

Changing birth rates and death rates

Higher birth rates	Lower birth rates	Higher death rates	Lower death rates
Children provide labour on farms **(E)** Large families are seen as a sign of virility **(S)** Women may lack education and stay at home to raise a family rather than work **(S)** A high infant mortality rate encourages larger families to ensure survival of some children **(S)**	People tend to marry later and therefore have reduced child -bearing years **(S)** Women are educated and often follow careers which delay starting families **(P)** The high cost of living means it is expensive to raise children **(E)** Couples prefer to spend money on holidays & cars **(E)**	HIV, Ebola and other difficult to control diseases are having an impact on death rates in LICs **(S)** In HICs, the increasingly higher proportion of elderly people in ageing societies is leading to an increase in death rates **(S)**	Better healthcare and vaccination programmes are more available to people **(P)** Less physically demanding jobs put less stress on people physically **(S)** People are educated about health and hygiene **(P)** Water supplies are more reliable and cleaner **(P)**

Population structure



7.2.1 - Development issues in Africa and Asia

Child labour

It is estimated that there is currently 168 million child workers and 73 million of these are children under the age of ten. Sub-Saharan Africa has the highest number of child workers mainly working on farms farming products such as cocoa and cotton.

- **Poverty** - parents need money or their parents have died
- **No (free) education** - have to pay or no formal education
- **AIDS** - Disease means a lot of middle-aged people are too ill or have died - so children are the only option

Primary education challenges

In 2010 there were 4.98 million children in child labour, whereas by 2011 there were 4.35 million child labourers. The lack of education is a key cause of child labour. Out of the 62% of India's children that do not attend school, 62% of those are girls. The reasons for this include:

- **Poor quality of school buildings**, facilities and teaching.
- **Attitude to women in society**: many families still have an oppressive attitude towards women
- **Many girls are expected to marry young** through arranged marriages.
- The **fear that sexual harassment of girls** may bring dishonour to the girl's family.

Responses to child labour

The International Labour Organisation (ILO) - It collects data from different countries and uses this data to set targets which can be used to monitor progress. The ILO then makes recommendation to individual governments as to how this can be achieved in their country which frequently include:

- **Improving access to education** for all children so that they can succeed in life
- **Creating more trade unions** to prevent and protect against child labour
- **Improving social security systems** so that the poorest in society are supported rather than them relying on their children (sick pay & unemployment benefits)

International refugee movements

Forced migrants are those we call refugees and asylum seekers. They have been pushed out of their homes but there aren't pull factors attracting them to somewhere
Refugee - Someone who has fled their home due to serious risk to life or liberty
Asylum seeker - Someone who has applied to another country for protection/support as a refugee

Causes of forced migration

Lack of food/water - often causes by droughts or blights (plant diseases)
Natural disasters -flooding, earthquakes, tsunamis etc.
War & conflict - either between countries or civil war (inside one country)
Persecution - risk to life or liberty due to politics, sexual orientation, religion, ethnicity

Responses to forced migration

National governments in Europe
- Germany and Sweden see the refugees as victims and have welcomed them to their countries and help them to integrate into their societies
- Austria is trying to limit the number of refugees to 80 a day
- The UK has agreed to accept 20,000 refugees from Syria by 2020 and it will accept more unaccompanied Syrian child refugees

International agreements
With an increasing numbers of migrants from Asia and Africa reaching Europe illegally the following changes have been made:

- In 2016 border controls were temporarily introduced to 7 Schengen countries
- An EU naval operation has been put into place to monitor the Mediterranean Sea to prevent human smuggling and trafficking
- EU member states agreed to provide task forces of national experts and support teams to work in hotspots such as Greece and Italy to expedite refugee screening

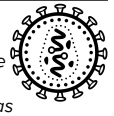
7.2.2 - Health issues in Africa

High infant mortality rate (IMR)

Neonatal infection - a high rate of infection from the process of delivering the baby
10% of early childhood deaths are caused by diarrhoea
The **lack of skilled birth attendants** leads to many children dying within 24 hours of being born
Lack of vaccinations and mosquito nets to stop diseases

Human immunodeficiency virus (HIV)

HIV is disease which attacks the body's immune system. Over 70% of people who have HIV live in Africa. Infection rates are higher in urban areas



Emotional impact on relatives and families, as well as on the individual **(S)**

Cost involved in treating the disease, eg. drugs means that most people go without treatment **(E)(S)**

Those infected will not eventually be able to work, lowering the productivity and potential wealth of a country **(E)(P)**

Leads to fewer jobs and less wealth in a country **(E)**

Children may be left without parents and brought up by their grandparents **(S)**

Malaria

Malaria is a disease passed on by parasites in mosquitoes. Infection rates are higher nearer water sources like lakes & rural areas. Children and pregnant women are most at risk

Large number of children aged under five die **(S)**

Adults are too weak to work which leads to a loss of productivity **(E)**

People remain poor and do not have a lot to eat **(S)(E)**

A country's limited resources are used up in health care rather than in education or improving services **(E)(P)**

Tourists may be less likely to visit a country so there is less revenue **(E)**

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7.2.2 - Health issues in Africa

Health issues responses
Investment in medical care and treatment in hospitals (**HIV/Mal)**
Health campaigns (adverts) about risks and prevention **(HIV/Mal)**
Free condoms **(HIV)** and mosquito nets for beds **(Mal)**
UN's AIDS Fast Track programme - leading education & funding **(HIV)**
UN's 'roll-back malaria' programme which leads a worldwide government response **(Mal)**
The '**Roll Back Malaria**' initiative had over 500 partners working together to provide a co-ordinated response to the disease. One of the UN's Millennium Development Goals is that the incidence of the disease should have reduced by 2015. Today the UN fast track strategy is aiming to end the epidemic by 2030 through contraception, education and medication.

Top-down approach	Bottom-up approach
Decisions are made at governmental level and usually involve a high cost. Communities likely to be affected by the decisions have no say as to what is done.	Decisions are made by the local communities that they will affect. They try to help communities by helping them to help themselves.
The advantages of these types of schemes are that they may be part of a strategic plan which aims to develop the infrastructure of the country. However, the frequently lead the country into debt and the jobs that are created are often not for the local community.	The advantages of these types of schemes are that they are small scale and so cost much less, are more sustainable and usually meet the needs of the local community better.

Home study questions

DEVELOPING

Describe the economic effects of a low pressure hazard **[3 marks]**

Explain why using HDI is better than GDP or GNI for measuring development **[4 marks]**

SECURING

Analyse the differences between the stage 2 and stage 3 population pyramids (7.2.1) **[6 marks]**

Explain why infant mortality rate (IMR) is an important factor to judge development **[3 marks]**

MASTERING

Evaluate how successful the responses have been in stopping international refugee movements into Europe **[8 marks]**

Discuss why poverty and poor development often leads to more child labour **[6 marks]**

CHALLENGE

Discuss how diseases like HIV and malaria can have significant impacts on a country's social and economic development. Record your discussion as a paragraph or spider diagram

Evaluate whether top-down or bottom-up approaches are better for improving the health development of LICs

Graphic Design

Year 10 Graphic design Knowledge organiser Spring Term

Learning topic 2: the work of graphic designers

TC1 - Understand a range of graphic design work and their associated features.

TC2 – Know about a range of different employment opportunities in the graphic design sector.

There are many different areas of graphic design and many different job roles within those areas. In term 2 you will learn about these areas and focus on one, such as advertising graphics, analyse their characteristics and begin to create work in the style of established graphic designers.

Health and social care

RO33 – Young Adulthood (19-45)

Describe the milestones of growth and development that the individual has experienced during young adulthood (19–45 years), using PIES.

MB1: 1–2 marks	MB2: 3–4 marks	MB3: 5–6 marks
Brief description of growth and development of the individual through the life stage, using PIES.	**Sound** description of growth and development of the individual through the life stage, using PIES.	**Comprehensive** description of growth and development of the individual through the life stage, using PIES.

Keyword	Definition
Milestone	A significant stage or event in someone's development.
Describe	Give an account including all the relevant characteristics, qualities or events
Brief	Work includes a small number of relevant facts or concepts but lacks detail, contextualisation or examples
Sound	Valid, logical, shows the student has secured most of the relevant understanding, but points or performance are not fully developed. Applies understanding and skills to produce the wanted or intended result in a way that would be useable
Comprehensive	The work produced is complete and includes everything required to show depth and breadth of understanding. Applies the understanding and skills needed to successfully produce the wanted or intended result in a way that would be fully fit-for-purpose

Key Milestones	
University	Bereavement
Marriage	Menopause
Buying first home	Learn a new skills
Moving house	Divorced
Having children	Second marriage
New job	Miscarriage
Promotion	Carer
Train in a new job	New friends

RO33 – Young Adulthood (19-45)

PHYSICAL	
Physical	Developments to your body
Gross motor skill	Use large muscles in the body which cause large movements.
Fine motor skill	Use smaller muscles and create small movements.
Mobility	The ability to move freely at the joints.
Body changes	Weight, reactions, senses and strength.
Sexual characteristics	Fertility Sexually mature
Menopause	When a women stops menstruating.
Aging characteristics	Skin, hair and posture

INTELLECTUAL	
Intellectual	Developments in your brain
Language development	Wide range, confident
Sentence construction	Well established
Logical thinking	Analysing a situation and coming up with a sensible solution.
Problem solving	Achieving a goal by overcoming obstacles.
Decision making	Making a choice based on the information provided.
Deterioration of mental abilities	Degeneration of the brain can begin.

EMOTIONAL	
Emotional	Developments to your feelings
Bonding	Close connection which someone.
Attachment	Affection or fondness for someone or something.
Independence	Not reliant on others
Self confidence	A feeling of trust in your abilities
Self image	The ideas of your appearance and personality.
Self esteem	Confidence in your own worth.
Love and Affection	An intense feeling of deep fondness or liking.

SOCIAL	
Social	Developments to your relationships
Relationships	A connection with someone else
Social skills	Interactions with another person
Responsibilities	Being accountable.

Examples
Give examples for each point made. Give an age and link it to PIES.

History

KNOWLEDGE ORGANISER: Changes in Crime and Punishment c.1500 to the present day (Unit 3)

KQ1: What have been the main causes of crime over time?

THE EARLY MODERN PERIOD : c. 1500s – 1700s

The Tudor period

The Tudor period was a time of great economic, social and political change.

Economic change brought disruption:

- A **growing population** made it harder to find work and put pressure on food supplies. This was especially the case after bad harvests.
- **Rising inflation** also contributed to higher food prices.
- **Landowners increased rents** and poorer tenants could not afford them.
- **The dissolution of the monasteries** by Henry VIII put many people out of work.
- **Enclosure** of land for sheep required fewer labourers.
- **Periodic slumps** in the cloth industry cost workers their jobs.

The number of poor, unemployed people increased. Many left their villages in search for work and became **vagrants.** Some turned to crime e.g., theft. Opposition to enclosure was a cause of Kett's rebellion in 1549.

There were **frequent changes in religion**. Subjects who refused to follow the religion of the monarch were guilty of **heresy** (and if this was accompanied by criticism of the king or queen it might also be classed as **treason**).

- Henry VIII's break with Rome led **to new treason laws** e.g., the leaders of the Pilgrimage of Grace were executed for treason.
- Under **Mary Tudor** heresy became a serious offence and over **250 heretics were burned at the stake**, including Archbishop Cranmer.
- Elizabeth also had to deal with plots and rebellions, e.g., Mary, Queen of Scots.

Other factors also played a part:

- the growing size of towns made policing more difficult.
- rebellions caused instability, e.g., the activities of the Yorkist pretenders Lambert Simnel and Perkin Warbeck, and the Essex Rebellion in 1601.

WELSH EXAMPLE :

Wales did not experience any major rebellions. However, it did have a reputation for lawlessness eg. cattle theft, often encouraged by the marcher lords, who were supposed to keep order but often profited from the crimes.

Religious change also affected Wales. Rawlins White, a Cardiff fisherman, was burned in 1555 for refusing to give up his protestant faith. In Elizabeth's reign, the catholic, Richard Gwyn, was executed in Wrexham for refusing to accept her as Head of the Church. John Penry, a puritan preacher, was also executed for heresy.

INDUSTRIAL PERIOD : c. 1750s - 1800s

Industrialisation and urbanisation in the 18th and 19th centuries

The 18th and 19th centuries **saw rapid population growth.** Existing towns increased in size and new ones like Manchester and Merthyr Tydfil developed rapidly. This increased opportunities for crime, which was often linked to **poverty** and **unemployment.** The end of the Napoleonic Wars in 1815 saw great hardship as the economy struggled to get back to normal after the war.

- **Urban areas** were **overcrowded** and full of **disease**. There was **little planning**. Many people lived in **back-to-back houses** with **open sewers** and rubbish-strewn streets. In hard times many people resorted to crime. **Alcohol was cheap** and easy to obtain so drink-related crime was commonplace.
- In new towns, unlike in farming villages, people tended not to know many of their neighbours; as a result, it was easier to get away with crime. Many criminals (including children) lived in **rookeries** whose narrow winding streets and alleyways made life easy for criminals. Policing was ineffective.
- **Periods of unemployment** or loss of work due to **accidents** were frequent, so destitute families stole to survive. Due to the low life expectancy, many fathers died young and so **orphans** were common in industrial towns. Orphans often turned to crime to survive.
- Workers had **no political rights** and so had no legal way to change their living and working conditions. Even joining a trade union was a criminal offence e.g., the Tolpuddle martyrs. **Violent protest** was not uncommon e.g., the Merthyr rising in 1831 and the Newport rising in 1838.

Poverty was also widespread in **rural areas.**

- Rural workers worked **long hours** for **low wages.**
- The introduction of **new technology**, e.g., steam-powered threshing machines, led to **loss of jobs.** Rural areas also saw violent protests e.g., the Swing Riots 1830-31.

WELSH EXAMPLE :

In the early 19th century Merthyr was the largest town in Wales. Houses had been built rapidly and living conditions were appalling. Not surprisingly Merthyr had a reputation for crime. Its poor working and living conditions were a major reason for the Merthyr Rising in 1831. Wales also experienced violent rural protest. The Rebecca riots 1839-43 were protests against the toll gates, but also about rising rents, payment of tithes and general rural poverty.

MODERN PERIOD : c.1900s-present day

The 20th and 21st centuries

The 20th century brought rapid technological change. Criminals have used new **technology** to commit crimes – either variants of existing crime or new crimes altogether.

Car crime increased as car ownership became more widespread:

- Laws have been introduced to make driving safer. Most car crimes are committed by drivers who are otherwise usually law-abiding eg. speeding, drunk-driving, driving without insurance etc. There are now over 1 million car-related crimes every year, making it the biggest category of crime by far.
- Cars have also been used by criminals to commit offences. e.g., as getaway vehicles or in ram-raids. More recently they have been used by terrorists to kill people. Crimes are committed on cars e.g., car theft or the theft of personal property left inside cars.

The invention of **computers** has also provided criminals with new opportunities.

- Computers have created new crimes like phishing and other scams to defraud people of money. Criminals have exploited weaknesses in online security to commit credit card and identity theft. This can be done remotely, often from other countries, and to thousands of individuals simultaneously.
- Computers (and social media) have increased the threat to certain individuals e.g., vulnerable children targeted by paedophiles or anonymous personal attacks on social media because of religion or race etc.

Criminal gangs and terrorist organisations have also made use of the computer and internet, hacking companies and organisations (such as the NHS) and targeting them with ransomware. Terrorist organisations have launched cyberattacks against governments or organisations they dislike.

Other causes of crime include **football hooliganism, drug-related crime** and more recently **knife crime**. Often these involve gangs in one way or another.

WELSH EXAMPLE :

Wales experienced a number of political disturbances during the 20th century. In 1911, strikes by railwaymen in Llanelli and by miners in Tonypandy both ended in riots. There were also serious disturbances during the miners' strike of 1984-5. Criminal acts have also been committed in support of the Welsh language and culture, e.g., the burning of second homes in Wales in the 1980s and 90s.

KNOWLEDGE ORGANISER: Changes in Crime and Punishment c.1500 to the present day (Unit 3)

KQ2: How has the nature of crime changed over time?

wjec cbac

THE EARLY MODERN PERIOD : c. 1500s – 1700s

The Tudor period

Vagrancy was a major problem for Tudor monarchs. Economic changes created poverty. Homeless beggars, known as vagrants, travelled the country looking for work. Many joined large groups and gathered in towns, causing problems for the authorities. Some stole ('rufflers') and others pretended to be insane or sick to extort money ('Abraham men').

Ordinary people blamed vagrants for the rise in crime. The **government responded with ever harsher punishments** (whipping, branding with a V, even hanging), particularly for the able-bodied poor e.g., those fit to work. This shows how seriously monarchs of the time viewed the problem.

Heresy was the crime of **not following the religion of the monarch** and was punishable by death. Frequent religious changes meant that many people were executed for heresy during the 16th century. This was particularly true of **Mary Tudor** who burned 280 protestants during her five year reign in her **"holy bonfires".**

The early 18th century

The 18th century was the "Golden Age" of **smuggling** and **highway robbery.**

- As governments **increased import duties** on goods like tea and brandy, so **smuggling increased**. Highly organised smuggling gangs sold cheap imported goods on the black market. A labourer could earn 6 or 7 times his daily wage for a night's smuggling. With thousands of miles of coastline for "revenue men" to patrol, it was difficult to catch smugglers. Ordinary people did not see smuggling as a crime and would not report on smugglers.
- **Highway robbery** became more widespread. As roads improved, so the wealthy began to travel more, carrying their valuables with them. The absence of police and long, open stretches of road made it easy to rob stagecoaches. Guns and horses were cheap and easily obtainable.

WELSH EXAMPLE :

Crimes like cattle theft were common in the Welsh Marches. Henry VIII was concerned that lawlessness would spread and sent Bishop Rowland Lee to restore order.

Wales also had its share of heretics. In 1555 the protestant Bishop Robert Ferrar was burned at the stake in Carmarthen, as was Rawlins White, a fisherman, in Cardiff. The Catholic teacher Richard Gwyn (in 1584) and the Protestant preacher John Penry (in 1593) were both executed during the reign of Elizabeth I.

INDUSTRIAL PERIOD : c. 1750s - 1800s

Industrialisation and urbanisation in the 18th and 19th centuries

Many of the crimes of this period reflect the harsh living and working conditions. As **industrial towns increased** in size, crime became more widespread, particularly during periods of unemployment.

- **Theft** and **pickpocketing** were common. The crowded narrow streets of towns were ideal places for pickpockets, particularly when large crowds gathered e.g. for public executions. Many pickpockets were children. Criminals concentrated in areas known as **rookeries** e.g. St Giles in London and "China" in Merthyr, where a maze of narrow streets and alleyways made it easy for thieves to hide.
- In times of unemployment people who were normally law-abiding might **steal money, food and clothes** to survive. In many towns people had to pay for clean water from pipes and taps, so **water theft** was a problem. Poverty also led many women into **prostitution** to earn a living.
- **Working conditions** also had an impact on the nature of crime. **New technology** put many people out of work, and some of the newly-unemployed responded violently. For example, between 1811 and 1813 workers known as **Luddites** smashed the weaving machinery that had cost them their jobs. The end of the Napoleonic War in 1815 saw even greater hardship as the economy struggled to get back to normal after the war.
- **Political unrest** was ever present, as workers turned to politics to improve their lives. However, their protests sometimes turned violent: for example, the Spa Fields Riots in London 1816 and the Chartist riots of the late 1830.

Crime in **rural areas** was also linked to poverty e.g. poaching to feed a family. In the **Swing Riots** of the early 1830s, farm labourers in the south of England destroyed the machinery that was putting them out of work. Nineteen were hanged and 481 were transported to Australia.

WELSH EXAMPLE :

There were many examples of disorder in Wales in the early 19th century. In the early 1830s the South Wales valleys saw the violence of the Scotch Cattle as they tried to end the Truck system and win higher wages. Other protests were more political: for instance the Merthyr Rising in 1831, which took place during an industrial slump. The disturbances at Llanidloes and Newport in 1839 were both linked to the Chartist Movement, which wanted the vote for all men over 21. From 1839 to 1843 rural areas witnessed the Rebecca Riots against the tollgates.

MODERN PERIOD : c.1900s-present day

The early 20th century

The early 20th century was in many ways similar to the 19th century. Poverty remained a cause of crime, and some economically-deprived urban areas eg. London's East End had a reputation for criminality. Some crimes were motivated by a desire for political rights, e.g. Suffragettes bombing and setting fire to churches in the 1910s, while others were related to working conditions eg. the Tonypandy Riots in 1920.

The post-war years

The crime rate increased in the 20th century, particularly after the 1960s. Many new types of crime emerged due to **economic, social and technological changes**. Many crimes can now be committed or influenced by people living outside the country e.g. cyber crime or terrorism. This was not the case during earlier periods of history.

Car crime is now the **most common crime** in Britain. This can be linked to the huge increase in car ownership. Most crimes are committed by car owners e.g. speeding, drink driving, not wearing a seat belt etc, but cars are also stolen by thieves or are used in other crimes e.g. ram-raiding.

Computer related crime has also seen a huge increase Many traditional crimes (fraud, harassment, child abuse) can now be carried out by computer. New digital crimes have also emerged, such as hacking and phishing. Criminal gangs have hacked into computers of companies and governments and demanded ransom payments.

Drug related crime has also been a feature of the 20th century. Drug trafficking is an international problem, and some drugs are produced in the UK. The sale of drugs is illegal and many drug users have turned to crime eg. theft to feed their addiction.

Terrorism has become a problem. In the 1960s the IRA began its campaign in Northern Ireland. In the 1970s and 80s IRA bombing and assassination occurred on the British mainland.More recently Islamist groups have launched and inspired attacks eg. the London bombings of July 7 2005.

WELSH EXAMPLE :

Wales has experienced periods of industrial unrest during the 20th century, often centred on the coal industry eg. the Tonypandy Riots of 1910 and the Miners' Strike of 1984-5.

Wales has also seen protests in support of the Welsh language and culture. In the 1960s Mudiad Amddiffyn Cymru planted bombs eg. to disrupt the water supply to Liverpool. In the 1980s and 1990s, members of Meibion Glyndŵr burned second homes in Wales.

KNOWLEDGE ORGANISER: Changes in Crime and Punishment c.1500 to the present day (Unit 3)

KQ3: How has responsibility for enforcing law and order changed over time?

wjec cbac

THE EARLY MODERN PERIOD : c. 1500s – 1700s

The 16th and 17th centuries

In the 16th and 17th centuries, policing was seen as a **civic responsibility.** Everyone had a duty to help keep law and order in their locality. Governments believed enforcing law and order was a **local responsibility.** The **Justice of the Peace (J.P).**, the parish **constables** and the town **watchmen** were the people responsible for this. They were all **unpaid amateurs.** The job of J.P. was a prestigious one, and was usually performed willingly. However, the job of constable was unpopular. It had to be done alongside their daily work, so it was often not done well. As well as catching offenders, constables had extra duties that seem strange today e.g. organising road repairs, checking weights and measures, and regulating ale houses.

In 1663 Charles II ordered the creation of a force of paid night watchmen, known as **Charlies**. **They were** paid from parish rates, but the pay was so low that only the old and decrepit applied. However, the idea of paying officials was new.

The 18th century

In the 18th century the growing population led to a rise in crime. This put a huge strain on the system of policing, but governments still viewed policing as a local responsibility. **Thief-takers**, private law-enforcers, appeared who helped to solve crimes and return stolen property. However, they were often involved in crime themselves e.g. the 'Thief-Taker General' Jonathan Wild, who headed a huge criminal empire.

In the 1750s the **Fielding brothers** created the **Bow Street Runners**, a small force of paid officers in the Bow Street area of London. They had some success in reducing crime in their area. They also got government funding to set up the **Bow Street horse patrol,** which cleared the roads around London of highwaymen. This showed the value of policemen as a deterrent, though highwaymen returned when the government stopped the funding. The publication of the **General Hue and Cry** newspaper also showed the value of shared information and became the basis for the Police Gazette. In spite of these successes, governments were reluctant to increase funding to develop policing further.

WELSH EXAMPLE :

The Marcher Lords had done a very poor job of keeping law and order in Wales. In the 1530s, Henry VIII decided to bring Wales under tighter control, taking away the powers of the Marcher Lords. Under the Acts of Union 1536-43, Wales was organised into shires, like England, with JPs and constables given responsibility for law and order.

INDUSTRIAL PERIOD : c.1750s - 1800s

The early 19th century

In 1800, responsibility for enforcing law and order had not changed since Tudor times. In spite of rising crime there was a lot of opposition to an organised **police force**.

- People were concerned about **loss of freedom** and invasion of privacy
- People did not want to pay **higher taxes** to pay for a police force.
- Many liberals feared that the government would use the police to **crush political opponents.**

However, **public opinion was beginning to change:**

- The **rising tide of crime** showed that the existing system was not working.
- **Fear of revolution** and **serious disturbances** eg. the Merthyr Rising, demonstrated the need for a professional organised police force.
- After the Peterloo Massacre of 1819, **the government became increasingly reluctant to use the army** to respond to protests

The Metropolitan Police and later developments

In **1829** the government took a key role in providing law enforcement in Britain for the first time. Home Secretary **Robert Peel** created **the Metropolitan Police,** a **trained, paid, professional force** of 3,300 men, who were responsible for policing an area up to 7 miles from Charing Cross. Though there was some initial opposition, the public soon came to see the value of the Metropolitan Police.

In 1835 boroughs were given the right to organize their own forces, and in 1839 counties were allowed to do the same (although few did). In **1856 the County and Borough Police Act** the made it **compulsory for every area to have its own force.** Every area now had a full-time, paid, professional police force. By 1900 there were 243 forces with over 46,000 officers, each inspected regularly by government

WELSH EXAMPLE :

In 1842 Glamorgan became the first Welsh county to set up a paid professional police force. 13 out of its 34 men were stationed in Merthyr which had seen serious disturbances in recent years. In 1843, a force was established in Carmarthenshire in response to the threat posed by the Rebecca Riots. Some boroughs e.g. Cardiff and Swansea also set up forces. However, most Welsh counties did not have forces until the 1856 Act made it compulsory.

MODERN PERIOD : c.1900s-present day

The 20th and 21st centuries

During the 20th and 21st centuries overall responsibility for policing has remained with the government, though the cost of policing is partly paid for from local council tax and partly from government grants.

Though some things have remained the same, there have been important changes in policing in England and Wales during the 20th century.

- **The number of officers increased** from just 46,000 in 1900 to 125,000 by 2017. However, **the number of forces has been reduced** from 243 in 1900 to just 43 by 1917. This was done to **improve efficiency** through **better training**, increased **specialization** and wider **use of technology.**
- Though police officers still patrol the streets to deter criminals and investigate crime, there is now a **greater emphasis on crime prevention**. Every force has **Crime Prevention Officers** who work in the community to achieve this.
- In response to criticism that police officers had become more remote, governments introduced initiatives to **restore community links** – through **Neighbourhood Watch schemes, community liaison officers** and **police community support officers (PCSOs).**
- In 2012 the government also introduced **elected police and crime commissioners (PCCs)**. These replaced the old police authorities which had supervised individual forces since 1946. PCCs are elected every four years. They are **meant to provide a link between the public and the police** and their role is to ensure that policing is efficient and effective.

WELSH EXAMPLE :

In the late 1960s Welsh police forces were reorganised to make them more efficient. The 12 existing county and borough forces were reduced to four – North Wales Police, Dyfed-Powys Police, South Wales Police and Gwent Police. In 2006 a proposal was put forward that Wales should follow Scotland's example and have just one force for the whole country, but this has yet to happen.

KNOWLEDGE ORGANISER: Changes in Crime and Punishment c.1500 to the present day (Unit 3)

KQ4: How effective have methods of combating crime been over time?

wjec cbac

THE EARLY MODERN PERIOD : c. 1500s – 1700s

The Tudor period

During this period the job of combating crime fell upon the shoulders of **JPs, constables** and **watchmen**. These were all untrained, unpaid amateurs.

- **JPs** were appointed by the crown to **supervise law and order in each locality.** Their workload increased to include things like organising road repairs and dealing with the poor.
- **Constables** assisted JPs. They had to **arrest troublemakers, bring them to court** and sometimes also **carry out punishments,** e.g., whipping vagrants. Other duties included reporting to the JP on the state of roads, checking ale houses etc. They were **chosen annually** from among the wealthier men of each parish. The job was **unpaid**, so not surprisingly many constables did not do it with much enthusiasm. Some paid others to do the job for them.
- All able-bodied men were also expected to take their turn to serve at night as **town watchmen**.
- In 1663 Charles II introduced paid night watchman known as **"Charlies."** However, they had little impact because pay was poor so only the old and infirm took the job.

The system was not very successful. JPs were overworked, parish constables hated taking time off from their own work and Charlies were ineffective. The fact that punishments were so harsh indicates that policing was not working very well.

The 18th century

In the 18th century, rapidly growing towns put added stresses on policing. **Thief-takers** appeared but they were often little better than criminals themselves. Far more important were **Henry Fielding** and his **Bow Street Runners** which had some success in reducing crime in that area of London. Fielding's brother John continued his work. He persuaded the government to set up the **horse patrol** which reduced highway robbery and showed the value of police in deterring crime, while the **"General Hue and Cry" newspaper** showed the value of information sharing.

WELSH EXAMPLE :

After the Acts of Union, policing in Wales was reorganised on the English model. JPs were appointed in each Welsh county e.g., Edward Stradling of St Donats Castle, who was JP in Glamorgan for much of the reign of Elizabeth I. They were supported by constables and watchmen. In 1651-2 the constable of the village of Prendergast was given the unusual task off stopping anyone from Haverfordwest from entering the village because of the presence of plague in the town.

INDUSTRIAL PERIOD : c.1750s - 1800s

The early 19th century

The 19th century saw the development of trained, professional police forces, first in London, then across the rest of England and Wales.

In **1829** Peel's **Metropolitan Police** was the **first full-time, trained and paid police force**. 3,300 men joined the force, all of whom had to be fit, over 5'7" tall, and able to read and write. They worked seven days a week, wore a **recognizable uniform** and spent their days **'walking the beat'** (a set patrol area on foot) to deter crime. They were successful in reducing crime in London, and many criminals left for other cities.

At first there was some opposition to the new force, especially in working class areas. Some wealthier citizens also objected to the increase in taxation required to fund the police. However, as crime rates fell they came to be accepted. The success of the Metropolitan Police led to the expansion of policing outside London.

- **1835 - the Municipal Corporations Act** gave other towns the power to set up their own police forces. The Borough **1839 County and Police Act** also gave counties the same right. However, few took advantage of these powers.
- **1856 - the County and Borough Police Act** made it **compulsory for every area in England and Wales to set up a police force.**

The 19th century also saw the **beginnings of specialisation** and the **use of technology:**

- The Metropolitan Police set up a plain clothes **detective branch in 1842**, which paved the way for the **Criminal Investigation Department** (CID) in 1878.
- In 1867 Scotland Yard began to use the **telegraph** to improve communication. From 1869 the **Criminal Records Office** compiled records of criminals, suspects and crimes. **Photography** was increasingly used in the late 19th century, first as mug shots of suspects and criminals and later at crime scenes.

By the late 19th century police across the country were having more success in combating crime.

WELSH EXAMPLE :

Events like the Merthyr Rising 1831 and the Newport Rising 1839 highlighted the need for trained police forces in Wales. Some towns like Cardiff, Swansea, Neath and Pwllheli established forces in the 1830s (though Neath and Pwllheli forces consisted of only 1 constable each). The first major force created in Wales was the Glamorgan County Constabulary in 1843.

MODERN PERIOD : c.1900s-present day

The 20th and 21st centuries

In the 20th and 21st centuries policing developed further and, arguably, had more success in fighting crime. As developments in transport and communication have changed society, and criminal behaviour, so the police have had to respond.

- **Developments in personnel** – women police constables WPCs first appeared in 1919. Special constables (1923), traffic wardens (1960) and PCSOs (2002) have been introduced to help police make better use of resources.
- **Specialization** e.g. dog handlers, Organised Crime Squad, the Anti-Terrorism Squad, SOCOs and use of forensic science has allowed expert officers to focus on particular areas of crime.
- **Developments in transport** have changed the nature of policing. The introduction of bicycles in 1909 and especially the **motor car** in 1919 allowed officers to respond to calls quickly and patrol a wider area. By the 1970s the patrol car had replaced the bobby on the beat. There are also more **specialized vehicles** e.g. motorway patrol cars, riot vans. Police have also made use of **helicopters, light aircraft** and **drones** for crowd control, to search for missing persons, etc.
- **Communications** have been revolutionized. The telegraph was already in use in 1900 and in 1902 the telephone was first used, followed by **two way radio in 1922**. These **improved response times** and **kept officers informed**. The introduction of the **"999" emergency number** in 1937 encouraged the public to report incidents. Today all police carry a two-way radio for instant communications with headquarters.
- **Computer technology** has improved record keeping and communication. Since 1974 the **Police National Computer** has held useful data e.g. criminal records, motor car details, missing persons etc. Since most police are now equipped with computer technology, they are able to make use of this data in real time. Photography and CCTV are also used.

In the late 20th century some people began to argue that the police had become too distant and had lost the day to day contact with the public. After the Brixton Riots in London in 1981, the police have worked to rebuild community links.

WELSH EXAMPLE :

In the 1960s police forces across England and Wales were amalgamated into larger units to improve efficiency. In Wales four new forces emerged – North wales, Dyfed-Powys, South wales and Gwent.

KNOWLEDGE ORGANISER: Changes in Crime and Punishment c.1500 to the present day (Unit 3)

KQ6: How have methods of punishment changed over time?

THE EARLY MODERN PERIOD : c. 1500s – 1700s

The 16th and 17th centuries

In the early modern era governments and society in general believed in the use of **capital and corporal punishments** carried out **in public. Punishments were harsh**, even for minor offences, because it was thought this would **deter crime.**

The most common form of **capital punishment** was **hanging** (though heretics were executed by burning at the stake and traitors by beheading or hanging, drawing and quartering). This was meant to **act as a deterrent** and to show the public that punishment was being carried out.

For **minor offences** there was a variety of punishments – the **stocks, pillory, whipping, ducking stool** etc. – depending on the crime. Vagrants were often whipped or even branded, while drunks went into the stocks or pillory.

Fines were also sometimes used e.g. for not attending church. Few people were sent to prison, apart from debtors and those awaiting trial, as well as vagrants who were sent to houses of correction.

WELSH EXAMPLE :

Local communities in Wales made use of the ceffyl pren for people who had offended against the moral code of the day e.g. adulterers or wife beaters. The guilty person was paraded around the village on the ceffyl pren (wooden horse) by men with blackened faces.

The 18th century

Harsh punishments continued into the 18th century. In fact, the **"Bloody Code"** increased the number of capital offences from 50 to 225. However the rising prison population and the reluctance of juries to give a death sentence for minor crimes forced governments to rethink. **Transportation** was adopted, as a middle punishment between hanging and the stocks and pillory. It had a number of advantages e.g. it reduced the prison population, removed criminals from the UK and helped develop the colonies. It continued in use until 1868

WELSH EXAMPLE :

Only 1-2% of convicts transported to Australia were from Wales. Of the 736 on the first convict ship that sailed in 1788 only 6 were Welsh (4 men and 2 women). However Wales did provide some very high profile convicts as the government used transportation to punish the leaders of popular protests eg. Lewis Lewis of the Merthyr Rising, John Frost and Zepheniah Williams of the Newport Chartists, and John Jones (Shoni Ysgubor Fawr) the Rebecca rioter.

INDUSTRIAL PERIOD : c.1750s - 1800s

The 18th and early 19th centuries

Methods of punishment remained much the same in the early 19th century. Public punishments still existed, while **prisons were in a deplorable state.** Most prisons housed a **mix of inmates** – all ages, male and female, those awaiting trial and hardened offenders. **Poor conditions** and **overcrowding** meant that **disease** was common. Gaolers were not paid, so charged the inmates for food etc.

Some reformers demanded changes. **Sir George O. Paul** designed prisons that were secure, had separate areas for men and women and gave inmates exercise and work. **John Howard** visited prisons and produced a report, "The State of the Prisons in England and Wales" (1777). He recommended better food, hygiene and clean water for prisoners; payment of gaolers; regular inspection and work and time for prisoners to reflect on their crimes. **Elizabeth Fry** focused on female prisoners and Newgate prison in particular. She improved conditions and taught inmates skills eg. knitting and set up a chapel and a school. She founded the 'Association for the Reformation of the Female Prisoners in Newgate'. Fry also gave evidence to a House of Commons committee on prison conditions.

As the 19th. century progressed methods of punishment changed:

- There was **less emphasis on corporal punishments** e.g. the pillory was abolished in 1837 and public hanging and transportation ended in 1868.
- Instead, there was **far greater use of prisons**. The **Gaols Act** (1823) began to bring prisons under government control. Incarceration now became the normal method of punishment for serious crimes.

New prisons were constructed and **new prison systems** were tried – the **separate and silent systems**, which were meant to make inmates reflect on their crimes. However, they failed to lower the reoffending rate and there was an increase in suicides. In the late 19th century these were abandoned and more emphasis was placed on welfare of prisoners. The **1856 Act** introduced **"hard labour, hard fare and hard board"**, as the emphasis swung back to punishment rather than reform. The Prisons Act 1877 placed all prisons under government control.

WELSH EXAMPLE :

New prisons were built in Wales after the Gaols Act e.g. in Beaumaris in 1830, Cardiff in 1832 and Swansea in 1861. The last public execution in Wales was Robert Coe in Swansea in1866. A crowd of 15,000 gathered for the event, including women and children; over 100 were injured in the crush. As he was about to be hanged, four women armed with knives tried to attack Coe and had to be removed by the police. It was incidents like this that led to the end of public executions.

MODERN PERIOD : c.1900s-present day

The 20th and 21st centuries

The 20th century has seen the greatest change in methods of punishment. There is now a greater emphasis on rehabilitation and on restitution. This can be seen in the way in which punishment has changed.

- **Fines are now the main form of punishment** e.g. for motoring offences, while for more serious offences prison is the norm.
- The few remaining corporal punishments were abolished. The crank and treadwheel were abolished in 1902; flogging in prisons did not end until 1948.
- The **death penalty was abolished in 1965.** It was seen by many as barbaric, unchristian and an ineffective deterrent. A number of high profile cases e.g. Derek Bentley and mistakes in sentencing e.g. Timothy Evans also led to its abolition.
- **Prisons** have seen many changes. Prisoners are treated more humanely e.g. they can wear their own clothes and more education is provided. **Prisoners are categorised** (A, B, C or D) according to their crime and placed into the relevant type of prison. **Open prisons** (Category D) have a more relaxed regime and prepare offenders for life back in the community
- An expensive and over-crowded prison system has also led to **alternative methods of punishment**. Some have been used to try to keep offenders out of prison e.g. **probation** (1907), **suspended sentences** (1967), **community service** (1972) and **electronic tagging** (1999). Others methods e.g. **parole** (1967) offer a reduced sentence for good behaviour.
- In the early 20th century **young offenders** were for the first time separated from adult criminals. The first **borstal** opened in 1902, followed in 1932 by Approved Schools. This aimed to limit the influence of older offenders. Due to high levels of reoffending, borstals were replaced by Youth Detention Centres in 1982; nevertheless, reoffending remains high.

Increasingly prisons have been seen as a punishment in themselves. Several schemes are in place to rehabilitate prisoners and give them the skills to find employment after their release. However, some people now feel that many sentences are too lenient and that they have failed to punish or reform criminals.

WELSH EXAMPLE :

The first borstal in Wales was opened in 1939 in Prescoed, near Usk. Since 2000 it has been a Category D open prison. Berwyn prison in Wrexham (opened 2017) is the largest in the UK with, room for over 2,000 prisoners.

KNOWLEDGE ORGANISER: Changes in Crime and Punishment c.1500 to the present day (Unit 3)

KQ5: Why have attitudes to punishment changed over time?

wjec cbac

THE EARLY MODERN PERIOD : c. 1500s – 1700s

The 16th and 17th centuries

In the 16th and 17th centuries, attitudes to punishment were dominated by ideas of **retribution** and **deterrence**. This attitude, which continued into the 19th century, led to **harsh punishments** in which the criminals suffered **pain, humiliation or death.**

- **Retribution** was meant **to make the criminal suffer**. For serious crimes, such as murder, this often meant **capital punishment,** usually by hanging. Those who committed lesser crimes such as begging received corporal punishment e.g. branding, whipping, the stocks, the pillory. These were meant to be painful and humiliating.
- **Harsh punishments** were also seen as **a deterrent,** a way to discourage others from crime, especially when they were **carried out in public**. Ordinary people liked the idea of **seeing justice being done.** Little use was made of prisons, and most prisoners were only temporary inmates awaiting trial or execution.

WELSH EXAMPLE :

In rural Wales, wrongdoers were paraded around a village on a "ceffyl pren" or "wooden horse". This was meant to humiliate them before the community.

Serious crimes were also punished publicly. In 1555 Bishop Robert Ferrar was burned at the stake for heresy in the market square in Carmarthen. The Catholic Richard Gwyn was hung, drawn and quartered in the Beast market in Wrexham in 1584, while the puritan John Penry was hanged in London in 1593.

The 18th century

Attitudes hardened during the 18th century. The number of capital offences were increased from 50 in 1658 to 225 by 1819. The list of capital offences included some minor crimes e.g. poaching. Parliament represented rich landowners and was determined to protect property rights at all costs. Juries, however, often refused to give a death sentence for minor offences so **transportation was introduced** as a lesser punishment. Transportation also had a number of advantages for the government. It reduced the prison population, removed criminals from the UK and helped develop the colonies. This practice continued until 1868.

WELSH EXAMPLE :

Following the Battle of St Fagans in 1648, 240 Welsh royalist captives were found guilty of treason and transported to the West Indies. Over the next 200 years over 2,200 Criminals were transported from Wales. The vast majority of these were men and fewer than 300 were women. Most of them had committed offences against property e.g. sheep stealing or burglary.

INDUSTRIAL PERIOD : c.1750s - 1800s

The 19th century

At the end of the 18th century and the start of the 19th century, prison reformers helped change attitudes. Ideas of retribution and revenge began to give way to the idea **that prisoners could be reformed.**

- **John Howard** wrote a report on **" The State of the Prisons in England and Wales".** He observed that prisoners were not separated by gender or type of crime; that many were dying of disease; and that gaolers were not paid and corrupt.
- **George O. Paul designed a new prison** that was based on four key principles – security, health, separation and reform. It had separate areas for male and female prisoners, as well as a chapel, workrooms and exercise yards.
- **Elizabeth Fry** campaigned for better conditions for female prisoners at **Newgate Prison** and taught skills to inmates. She convinced many people that prison conditions were inhumane and uncivilised.

There was also a growing feeling that **punishments should fit the crime.** In 1823 **Peel abolished the death penalty** for over 180 crimes; by 1861 only five crimes still carried the death penalty. The pillory was abolished in 1837 and the stocks in 1872. Public executions ended in 1868, showing the reduced emphasis on revenge and deterrence. 90 new prisons were built during the mid-19th century. Two new systems were used.

- The **separate system** kept **prisoners isolated** in their own cells, often for weeks on end. They were made to work machines like the crank. This was meant to make them reflect on their crimes and be reformed.
- The **silent system** was meant **to break prisoners** through a regime of harsh discipline e.g. doing monotonous tasks such as walking on a treadmill.

These systems were extremely harsh. Many prisoners committed suicide and there was little evidence that the systems were successful in reforming criminals. The 1865 Prisons Act introduced "hard labour, hard fare and hard board". It was a return to the idea of strict punishment rather than the attempts at reform.

WELSH EXAMPLE :

John Howard visited two Welsh gaols, Caernarfon and Swansea. In Caernarfon the inmates were housed in insanitary conditions in tiny cells without windows. In the mid 19th century new prisons were built in Beaumaris in 1830, Cardiff in 1832, and Swansea in 1861. In the 1860s a four story wing was added to Ruthin Prison, based on the design for Pentonville prison, and used the separate system for its inmates.

MODERN PERIOD : c.1900s-present day

The 20th and 21st centuries

There were **significant changes in attitudes to punishment** during the 20th century.

The idea that some people were born criminals was replaced by a belief that **prisoners could be reformed** by better treatment and education. **Prisons became more humane** e.g. 1902 hard labour ended and solitary confinement in 1922, teachers were employed, and prisoners no longer had to wear prison uniforms. In 1936 the first open prison was built to prepare inmates for life outside.

Young offenders were treated differently – e.g 1908 the first **borstal** was opened (to keep them away from experienced criminals); 1908 the "Children's Charter" ended prison sentences for under 14s; 1982 borstals were replaced by detention centres (for short sentences) or **Youth Custody** (for longer sentences, often for violent offenders) to take offenders out of a bad environment. Young offenders can also be given community service, ASBOs or tagged.

The **death penalty was abolished** in 1965 (Murder Act). Capital punishment was considered inhumane and it was felt the state had no right to take a life. Mistakes had been made and It was not an effective deterrent. Life imprisonment replaced hanging for murder.

Alternatives to prison were introduced, partly to try to stop offenders getting into the system and becoming career criminals but also to reduce prison populations. Examples include **probation** (1907), **suspended sentences** (1967), **community service** (1972), and **electronic tagging** (1990s). Also **parole** (1967) gave reduced sentences for good behaviour.

However, not all members of the public shared these ideas. Newspaper polls often show that many people want longer sentences for certain offences or the return of the death penalty. Governments have also been inconsistent in their attitudes.

WELSH EXAMPLE :

One of the last people to be executed was the Welshman Timothy Evans. He was hanged in 1950 for the murder of his wife and daughter, but it was later proven that it was a neighbour, John Christie, who had committed the crime. This was one of the cases which made people question the death penalty.

Since 1992 the UK government has allowed private firms to run some of Britain's prisons. In Wales a new privatised prison, Parc Prison near Bridgend, opened in 1997. However, the idea of private firms running prisons remains controversial.

Interactive Media

R093: Camera techniques

Whether planning a feature film, music video or magazine front cover image, camera angles and shots are carefully chosen to help create meaning for an audience or create impact in a scene.

Extreme long shot

An extreme long shot or extreme wide gives impressive views of a location. Aerial shots may sweep across mountains or to show entire cites.

Low angle

A low angle shot is achieved by point the camera up from a low height at the subject or object. This has the effect of making the subject look larger and more important. It can be combined with a high angle shot to show a difference in power between characters

High angle

A high angle shot positions the camera higher than the subject, pointing down at them. This can make the character seem weak or vulnerable. It can also give a sense of isolation and make the viewer fearful for their fate.

Over shoulder

An over the shoulder shot is used during a conversation and puts the viewer in the characters shoes. It also allows the viewer to see how a character responds to the conversation and helps create intimacy between two characters.

Keywords

- Camera shot
- Camera angle
- Close-up
- Extreme close-up
- Mid shot
- Long shot
- Establishing shot
- Extreme shot
- Extreme wide
- Low angle
- High angle
- Aerial shot
- Over the shoulder

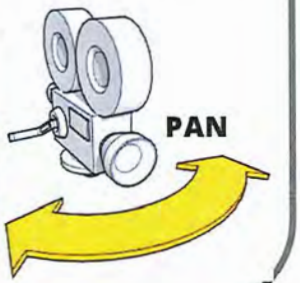
QR codes

R093: Camera techniques

Whether planning a feature film, music video or magazine front cover image, camera angles and shots are carefully chosen to help create meaning for an audience or create impact in a scene.

Pan

Panning moves the camera left and right horizontally. This may be used to follow characters as they walk or to follow a car as it drives past.



Tilt

Tilting pivots the camera up and down vertically. This might be used to take in a scene for example conveying the height of skyscrapers in a city.

Zoom

The lens of a camera can be zoomed in or out to make the subject appear closer or further away. The camera itself does not move, but the focal point changes. Zooming into a subject may help to draw the viewer towards a specific detail, whilst zooming out will help to reveal the wider context of a scene.

Track and dolly

A tracking shot is used when camera follows one of more subjects, immersing the viewer in the scene. The camera might be mounted on a dolly (a platform on wheels on which the camera is mounted) and placed on a track in order to achieve smooth movement.

Tracking shots can also be made with a handheld camera, for example following the subject when they are running which results in an unsteady and jerky shot. Handheld shots can increase the intensity of a scene, creating a sense of panic or to highlight intimacy and emotion.

Keywords

- Pan
- Zoom
- Tilt
- Track and dolly
- Tracking shot

QR codes

R093: Camera techniques

Whether planning a feature film, music video or magazine front cover image, camera angles and shots are carefully chosen to help create meaning for an audience or create impact in a scene.

Close up

A close up shot is taken at close range to the subject. A close up allows the viewer to see detail such as expressions or emotions. It can also highlight a pattern or detail on an object.

Extreme close up

An extreme close up shot focuses on a small part of the subject such as the eyes or mouth. This shot tells the viewer exactly where to look and can effectively communicate with the emotional state of the subject.

Medium shot

A medium shot or mid shot shows an actor or group of actors from the waist up. It is used to capture conversations whilst giving some information about the setting and the body language of the subjects.

Long shot

A long shot, also known as a wide shot shows the characters and objects in their surroundings. It helps immerse the audience into the film and is often used in establishing shots. It is also used for action scenes to give a broad view of action.

Keywords

- Camera shot
- Camera angle
- Close-up
- Extreme close-up
- Mid shot
- Long shot
- Establishing shot
- Extreme shot
- Extreme wide
- Low angle
- High angle
- Aerial shot
- Over the shoulder

QR codes

R093: File compression

Some files such as video, music or images are very large. This requires lots of storage space to save. Compression is used to reduce the size of a file. There are two types of compression lossy and lossless.

Lossy compression

Lossy compression can be applied to graphics, photos, videos and music. It can result in a significant reduction in the file size, but it will lose some of the original information. If an image is over compressed, too much information is lost and errors will be noticeable. The lossy compression can result in digital artefacts such as pixelation and incorrect colours.

Image file formats include JPG

Audio files formats include MP3 and AAC

Video file formats include MPEG

Lossless compression

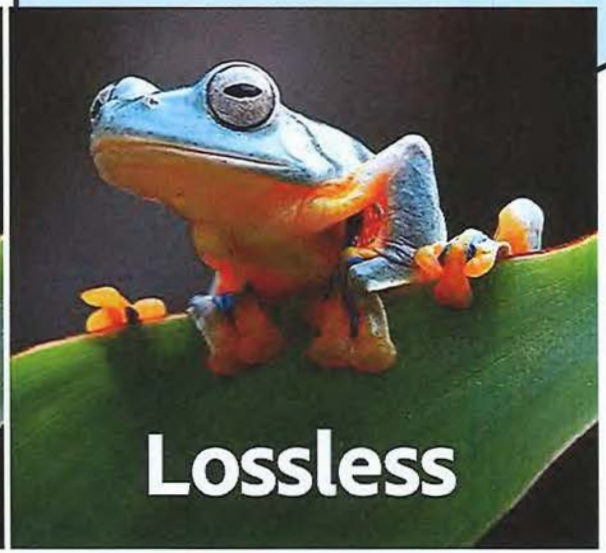
Lossless compression can be used on text files, zip files, photos, music and video. No information is lost when the file is compressed. This is the only way to compress files such as text documents or computer game code. Lossy compression usually compresses more than lossless compression.

Image file formats include PNG and Svg

Audio file formats include ALAC, FLAC, and WAV

Video file formats include H.264 lossless and Motion JPEG Lossless

Other file formats include ZIP for compressing files and folders.



Keywords

- Lossy
- Lossless
- Pixelation
- JPG
- MP3
- MPEG
- PNG
- SVG
- WAV
- ZIP

QR codes

R093: Properties of image files

When using image files, you must consider where it will be used as this will alter the technical requirement of the image. For instance, and image used in a printed magazine will need a very high resolution.

Resolution

Resolution is the number of pixels in a given area. It is measured as dots per inch (DPI) for print images and photographs and pixels per inch (PPI) for screen images.

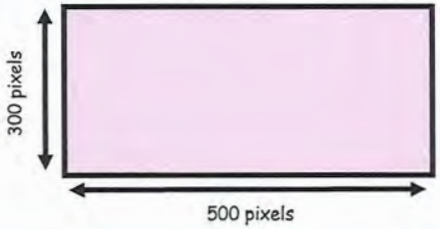
The higher the PPI/DPI the higher the quality image

Printed documents such as books and posters typically use a resolution of 300 DPI. This means that there will be 300 printed dots in 1 inch of the printed document.

Web pages typically use images with a resolution of 72 DPI.

Pixel dimensions

This is the measurement of an image in pixels. It is calculated by multiplying the pixel width by the pixel height. In this example, the image measures 500 wide and 300 pixels high so it has 15,000 pixels in total. A 10 megapixel camera will have 10 million pixels in one photo.



Vector images

Vector images are made up of shapes such as lines, curves and fills. Files are small in size and can be made bigger of smaller without affecting the quality of the image. They are commonly used for icons, logos, diagrams, animations and illustrations. SVG images are vector images.

Bitmap images

Bitmap images, also known as raster images are made of small squares called pixels. File sizes tend to be larger. Images can be made smaller on the screen but if they are enlarged, they will become pixelated or blurry. Bitmap images are widely used in photographs. JPG and TIFF all use bitmap images.

Keywords

- Resolution
- Dots per inch (DPI)
- Pixels per inch (PPI)
- Pixel dimensions
- Static file format
- JPG
- PNG
- SVG
- TIFF
- Vector
- Bitmap

QR codes

R093: Work planning and documents used to support ideas generation

A script is a written document used for media products such as TV, documentaries, TV, radio, news, film, games (cut scenes)

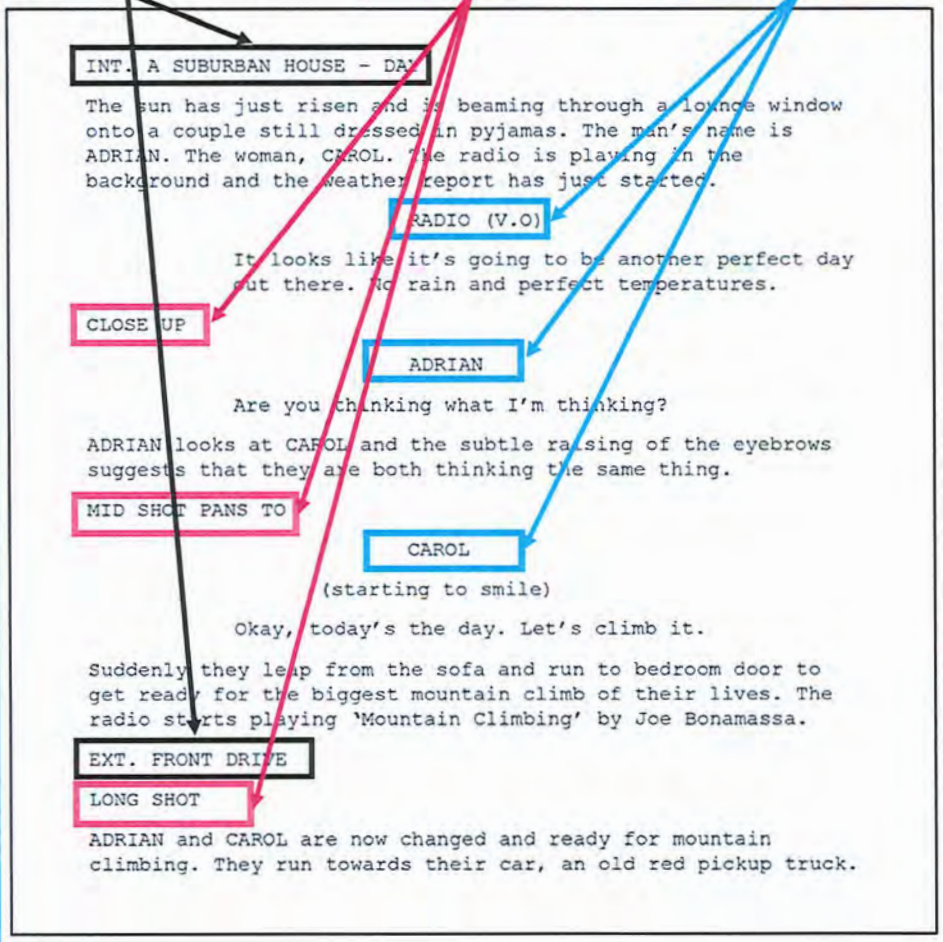
Conventions of a script

- Dialogue is indented under the characters name
- Capitals are used for names and headings
- Bold is used for actions, emotions or emphasis
- Speech direction may be given in brackets
- Scripts usually use Courier font
- Scene headings use abbreviations such as EXT (exterior) or INT (interior)

Locations

Shot types

Characters



INT. A SUBURBAN HOUSE - DAY

The sun has just risen and is beaming through a lounge window onto a couple still dressed in pyjamas. The man's name is ADRIAN. The woman, CAROL. The radio is playing in the background and the weather report has just started.

RADIO (V.O)

It looks like it's going to be another perfect day out there. No rain and perfect temperatures.

CLOSE UP

ADRIAN

Are you thinking what I'm thinking?

ADRIAN looks at CAROL and the subtle raising of the eyebrows suggests that they are both thinking the same thing.

MID SHOT PANS TO

CAROL

(starting to smile)

Okay, today's the day. Let's climb it.

Suddenly they leap from the sofa and run to bedroom door to get ready for the biggest mountain climb of their lives. The radio starts playing 'Mountain Climbing' by Joe Bonamassa.

EXT. FRONT DRIVE

LONG SHOT

ADRIAN and CAROL are now changed and ready for mountain climbing. They run towards their car, an old red pickup truck.

Keywords

- Script
- Dialogue
- Stage directions
- Scene directions
- Camera angles
- Sound effects

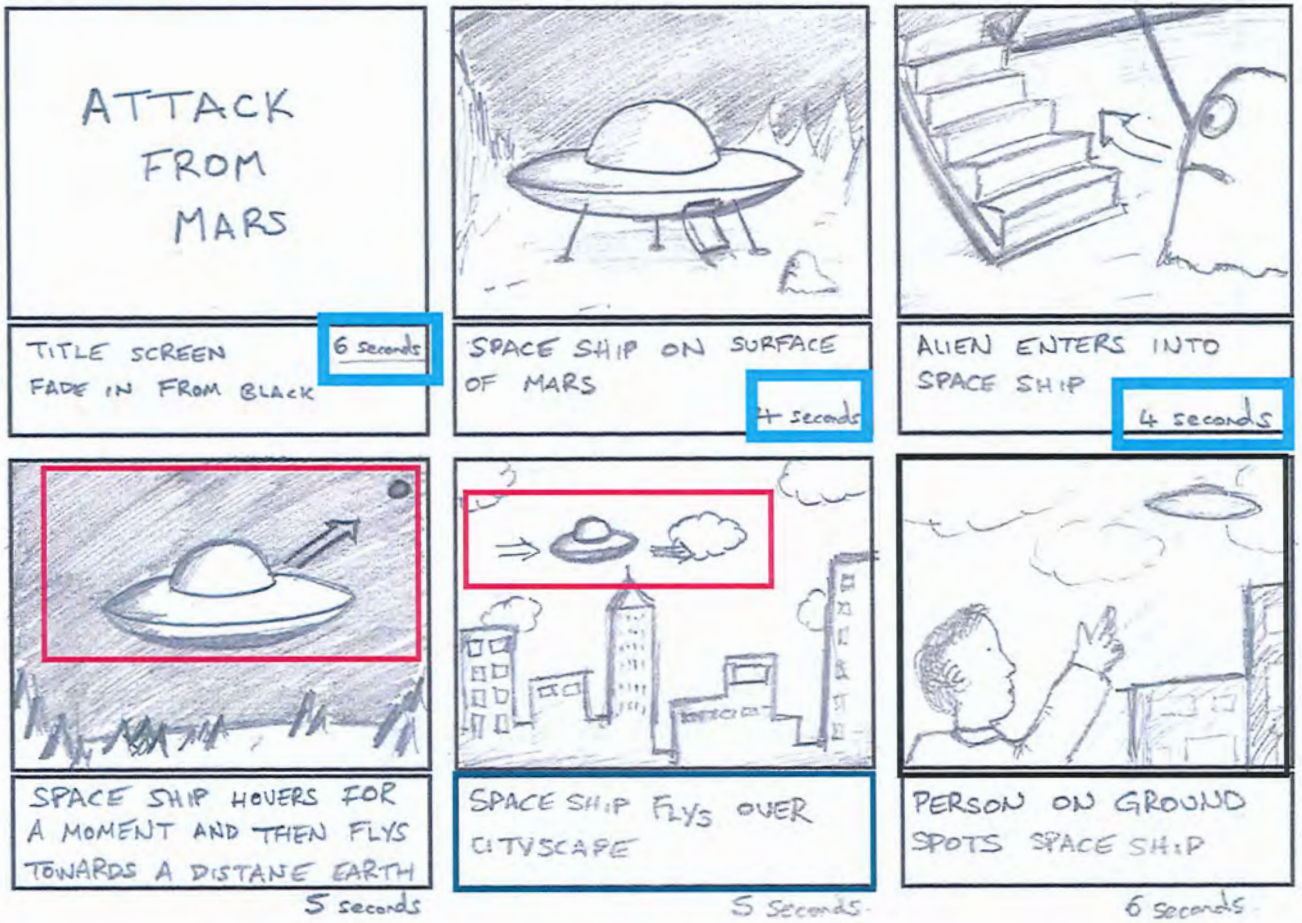
Scripts are used by:

- Actors
- Film Crew
- Narrators
- Sound editors
- Directors
- Continuity

QR codes

R093: Work planning and documents used to support ideas generation

A storyboard is a series of drawings, usually with brief directions, showing the sequence of shots needed in film or TV. Some computer games may also make use of storyboards.



Timings

Direction of movement

Drawing of scene

Description of scene

Content of conventions of a storyboard

- Timings and number of scenes
- Camera shots and movement
- Location
- Sound

Keywords

- Storyboard
- Director
- Timings
- Location
- Camera shots
- Camera movements
- Sound

Who uses a storyboard?

- Director
- Director of photography
- Camera operators
- Members of production team

QR codes

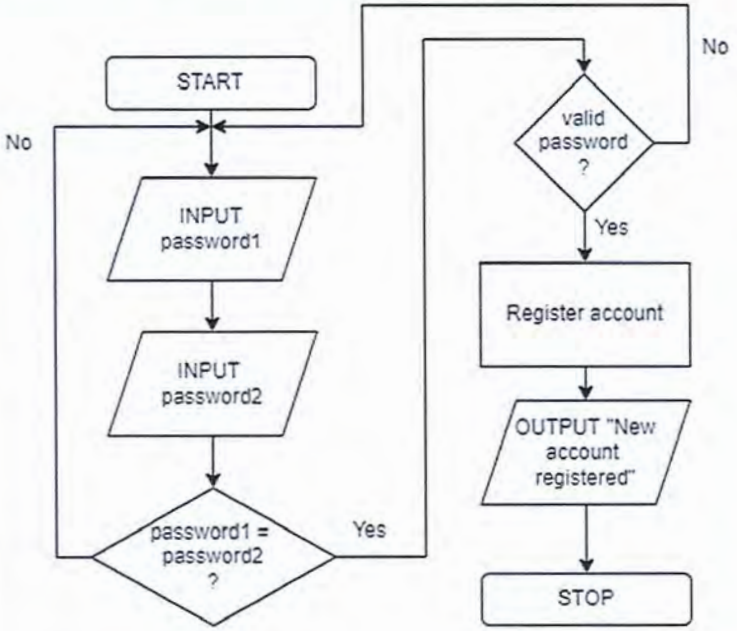
R093: Work planning and documents used to support ideas generation

A flowchart is a diagram that represents a workflow or series of processes. It offers a clear step-by-step approach including decisions that may be made along the way and their outcomes.

	Terminator (Used for START and END)
	Process
	Direction of flow
	Decision
	Input / output

Users of flowcharts

Organisational processes	Web designer, web developer
Production manager, director, editor, camera operator	Programmer
	Animator



Flow charts are usually made on computers, however, they may be made by hand

- Basic software to make flow charts includes: Word-processors, presentation software, desktop publishing software
- Specialist software is also used to make flow charts, such as: Microsoft Visio, Lucid charts, Smart Draw and many others

Keywords

- Flowchart
- Terminator
- Process
- Decision
- Input/output
- Arrows

Uses of flowcharts include:

- Organisational processes – such as what do in an emergency in a TV studio
- Instructions on a process for using equipment safely
- Algorithms or processes that will be needed on a website
- Algorithms or processes for characters in a computer game

QR codes

R093: Work planning and documents used to support ideas generation

A mind map or spider diagram is a way to plan out thoughts and ideas in an organised way. A mind map can be created digitally or be hand drawn.

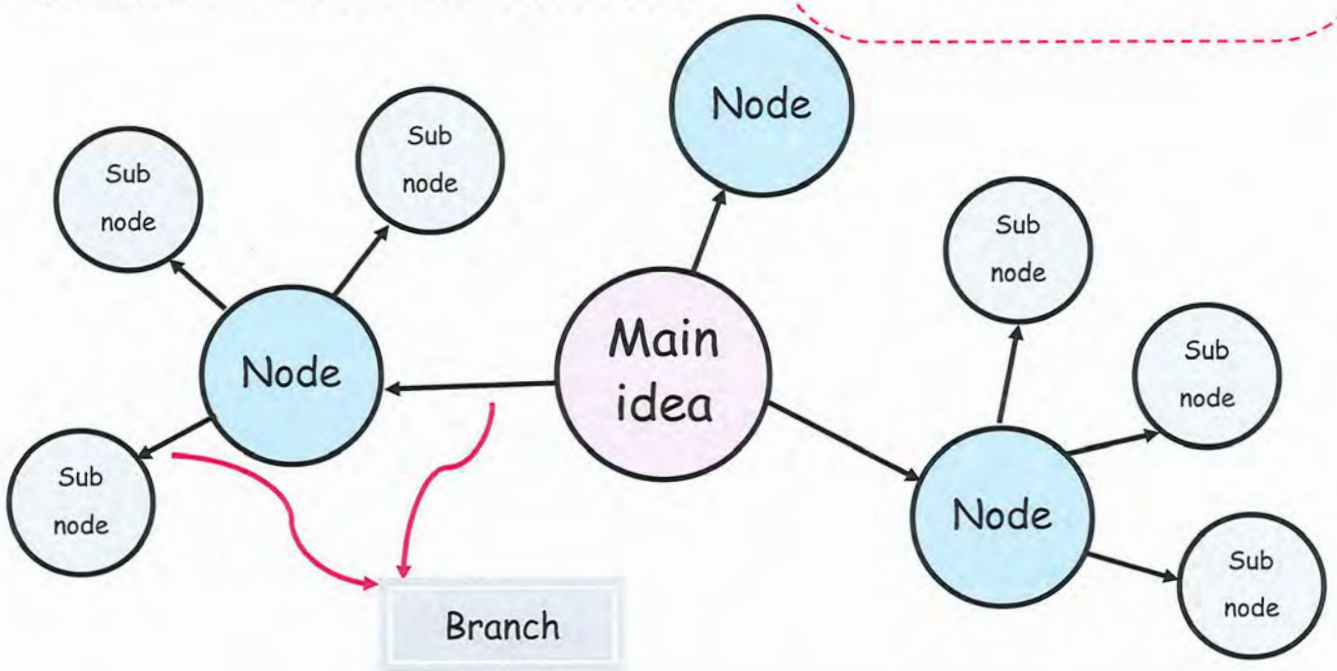
Purpose of a mind map

- The purpose of a mind map is to outline ideas quickly
- A mind map also shows the connections between different ideas

- Mind maps can be made digitally or hand drawn.
- Digital mind maps can be made on dedicated software (these can also be shared within a design team)

Content of a mind map

- A mind map consists of the main or central idea in the middle
- Nodes are connected to the main idea using lines called branches
- Sub-nodes are connected to the nodes to help organise ideas
- Each node or sub-node includes text and/or images



Keywords

- Mind map
- Digitally
- Hand drawn
- Central idea
- Node
- Branches
- Sub-nodes

QR codes

R093: Work planning and documents used to support ideas generation

A mood board is a planning document that assembles a range of materials in order to reflect the potential style of a media product.

Purpose of a mood board

- Develop feeling and style of a product before it is made.
- Giving ideas for the later planning stages
- Refer to when producing the final media product
- Gain feedback from a client or design team

Content of a mood board

Physical mood board

Produced on a large piece of paper or card and contain materials such as photographs, pages cut out from a magazine, fabrics , examples of typography and colour swatches/

Digital mood board

A digital mood board may include digital images, graphics, text, videos and audio files.

Digital mood boards are made in a wide range of software.

Keywords

- Mind map
- Digitally
- Hand drawn
- Central idea
- Node
- Branches
- Sub-nodes

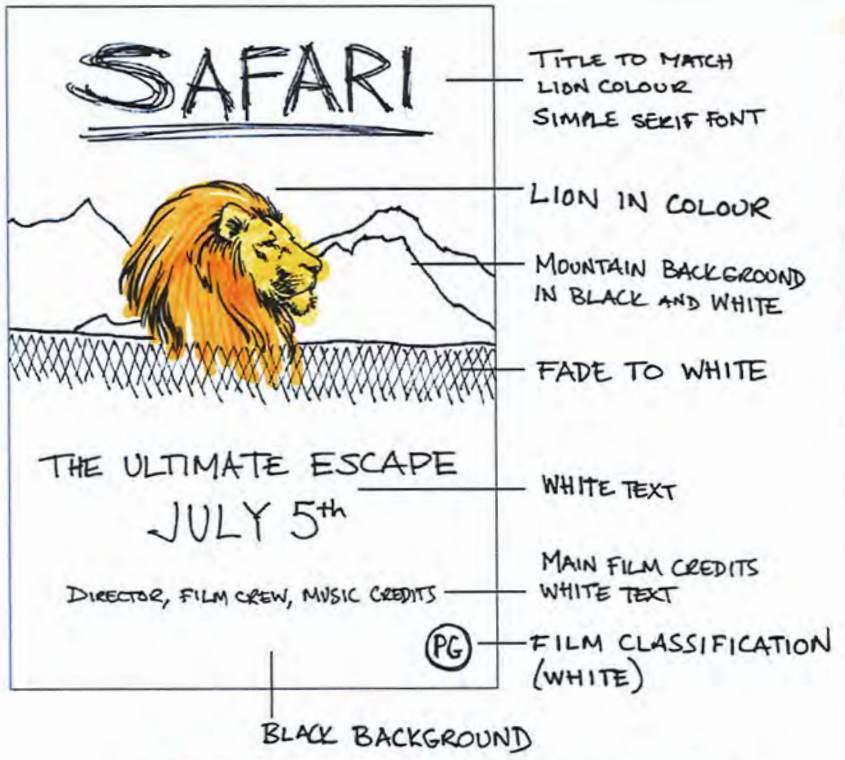
Physical mood board

Digital mood board

QR codes

R093: Work planning and documents used to support ideas generation

A visualisation diagram is a rough sketch of a media product. The purpose of a visualisation diagram is to give a representation of how a film product will look including content, layout, font and colour.



Software for visualisation diagrams

- Word
- PowerPoint
- Publisher
- Photoshop/Affinity

Hardware for visualisation diagrams

- Pen
- Paper
- Coloured pens
- Scanner
- Printer

A good visualisation diagram should contain enough detail that a graphic designer could create the product using it.

Sketches of the content

Layout and positioning of assets

Where are the graphics going to go on your product?

Annotations

Labels around your diagram which provide extra information

Specific features

Typical features e.g. magazine cover visualisation diagram would show a front

Keywords

- Visualisation
- Sketches
- Layout/position
- Annotation
- Features

Visualisation diagrams are used for:

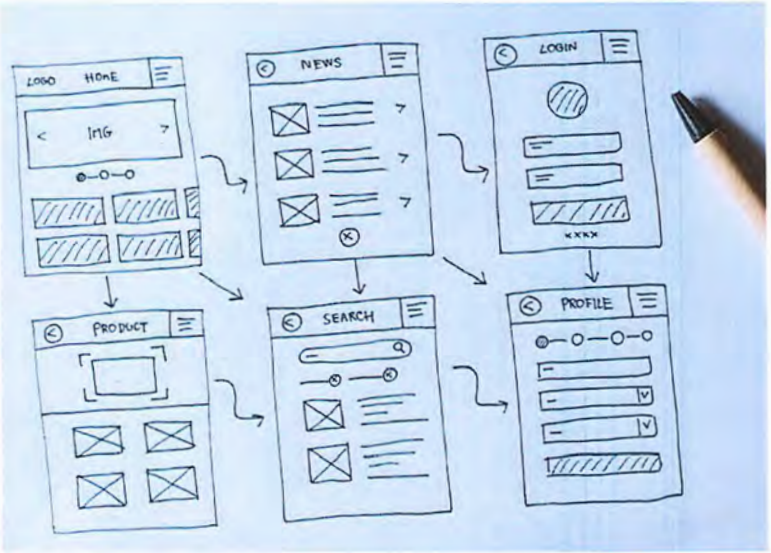
- Brochures or leaflets
- Magazines or book covers
- Posters
- DVD/Blu-ray covers
- Comic pages
- Web pages
- Game screens/characters/environments
- Print averts

QR codes

R093: Work planning and documents used to support ideas generation

A wireframe is a planning document that shows the layout and functionality of interactive products such as apps or websites. It also shows how different webpages or screens link to one another.

- The specific content used for text, images and video will likely be dynamic (it will change)
- Images are usually indicated by a box with an X inside it
- Text is usually indicated using lines or dummy text
- Buttons and text boxes are indicated with squares



Keywords

- Wireframe

Users of wireframes include:

- Website designers
- Website developers
- UX designers (User experience designers)
- App developers / designers / programmers

QR codes

R093: Work planning and documents used to support ideas generation

Work plans are used to plan out the different elements that need to be completed within a project. In media there are 3 phases: pre-production (planning), production (creating) and post-production (editing and reviewing)

Components of a workplan

Resources — Resources include the hardware, software and people required to complete the project

Timescales — The time given to each activity and task in the project

Workflow — This is the order in which activities are completed.

Contingencies — Contingencies are a back up plan when problems occur. This is spare time allocated for the unexpected.

Milestones — Milestones are the dates when key parts of the project are complete

Tasks — Tasks are the main phase of the project such as pre-production

Activities — Tasks are broken down into activities. They are smaller parts of a task.

A workplan can be created on Excel or dedicated workplan software.

Number and name of the action		2012		2013			
		III	IV	I	II	III	IV
A. Preparatory Actions							
A.1	Experimental data collection campaign during a winter season						
A.2	Project Requirements Analysis						
B. Implementation actions							
B.1	System design						
B.2	System implementation						
B.3	System integration						
B.4	Pilot realization						

Keywords

- Workplan
- Phases
- Pre-production
- Production
- Post-production
- Resources
- Timescales
- Milestones
- Tasks
- Dependencies
- Activities
- Subtasks
- contingencies

QR codes

Music

JS Bach: Badinerie

Form and structure:

The piece is in **Binary** form (**AB**).

Section A is 16 bars long.

Section B is 24 bars long.

Each section is repeated (**AABB**).

Harmony:

Diatonic; mixture of root position and inverted chords; uses V7 chords and a Neapolitan sixth chord.

Imperfect and perfect cadences are clearly presented throughout. Both sections end with a **perfect cadence**.

Dynamics:

Mostly ***forte*** throughout, although no markings appear on the score.

On some recordings, **terraced dynamics** (sudden changes) are included.

Metre and rhythm:

Simple duple time – 2/4 – with two crotchet beats in every bar.

Uses **ostinato rhythms** which form the basis of two short musical ideas (X and Y), consisting almost totally of **quavers and semi-quavers**.

Background details:

Composed by **Johann Sebastian Bach** (1685 – 1750), one of the main composers of the **Baroque** era in music.

Badinerie is the last of seven movements from a larger piece called **Orchestral Suite No.2**.

The piece was composed between **1738-1739**.

Instrumentation:

Flute, string orchestra and harpsichord.

The score has five parts (flute, violin 1, violin 2, viola and cello). The harpsichord player reads from the cello line and plays the notes with their left hand whilst filling in the chords with their right hand.

Tonality:

Section A begins in **B minor** (tonic) and ends in **F♯ minor** (dominant minor).

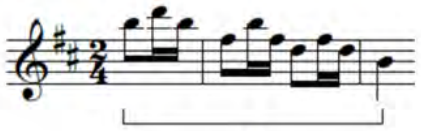
Section B begins in **F♯ minor** (dominant minor) and ends in **B minor** (tonic).

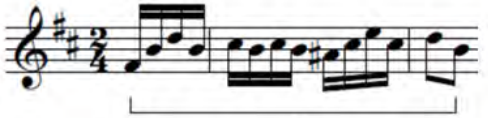
Section A modulates from B minor through **A major** before arriving at F♯ minor.

Section B modulates from F♯ minor through **E minor, D major, G major** and **D major** before arriving at B minor.

Melody:

The movement is based on **two musical motifs**.





Both motifs begin with an **anacrusis**. Motif X is entirely **disjunct** whilst motif Y **combines disjunct and conjunct** movement.

Typical **ornaments and compositional devices** of the period are used including **trills, appoggiaturas** and **sequences**.

Texture:

Homophonic: melody and accompaniment.

The flute and cello provide the main musical material; however, the 1st violin participates occasionally.

The 2nd violin and viola provide harmony with less busy musical lines.

Tempo:

The tempo is **Allegro** (quick, lively, bright), although not marked on the score.

Toto: Africa

Soft rock

Form and structure:

The piece is in **strophic** or **verse-chorus** form.

Intro	Verse 1 / Verse 2	Chorus 1 / Chorus 2	Link 1 / Link 2	Instrumental	Chorus 3	Outro
1 – 4	5 – 39 / 14 – 39	40 – 57	58 – 65	66 – 82	40 – 92	93 – 96
4 bars	35 bars / 26 bars	18 bars	8 bars	17 bars	22 bars	4 bars

Metre and rhythm:

Simple duple time – 2/2 (split common time) – with two minim beats in every bar.

Uses distinctive **ostinato rhythms** for both riffs, consisting almost totally of **quavers**, with constant use of **syncopation**.

Vocal rhythm looks complex but follows the natural rhythm of the lyrics.

Background details:

Composed by band members **David Paich** and **Jeff Porcaro**.

Recorded by the American rock band Toto in **1981** for their fourth studio album entitled **Toto IV**.

Released in **1982** and reached number one in America on 5 February **1983**.

Genre: **soft rock**.

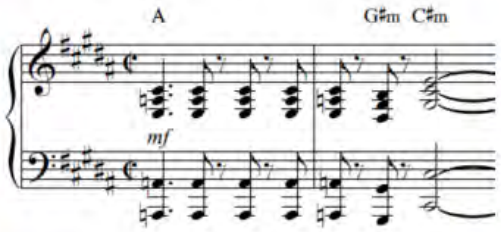
Instrumentation:

Rock band: drum kit with additional percussion, lead and bass guitars, synthesisers, male lead vocals and male backing vocals.

Harmony:

Diatonic; mixture of root position and inverted chords.

Riff a can be heard during the intro, verses, link sections, instrumental and outro. This riff uses a three-chord pattern: **A – G♯m – C♯m**.



Choruses use a standard chord pattern: **vi** (F♯m) – **IV** (D) – **I** (A) – **V** (E).

The **harmonic rhythm** (the rate of chord change) is mostly once per bar.

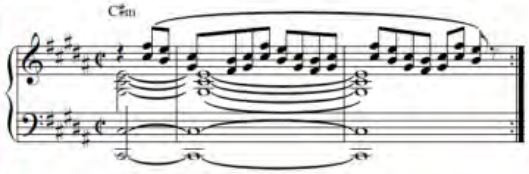
Dynamics:

Most of the song is ***mezzo-forte*** (moderately loud) whilst the choruses are ***forte***.

Melody:

Mostly **conjunct** (moving in step) with a **wide vocal range**.

Riff b uses the **pentatonic scale** (interpreted through E major):



Vocal improvisations occur towards the end of the song.

Texture:

Homophonic: melody and accompaniment.

Tonality:

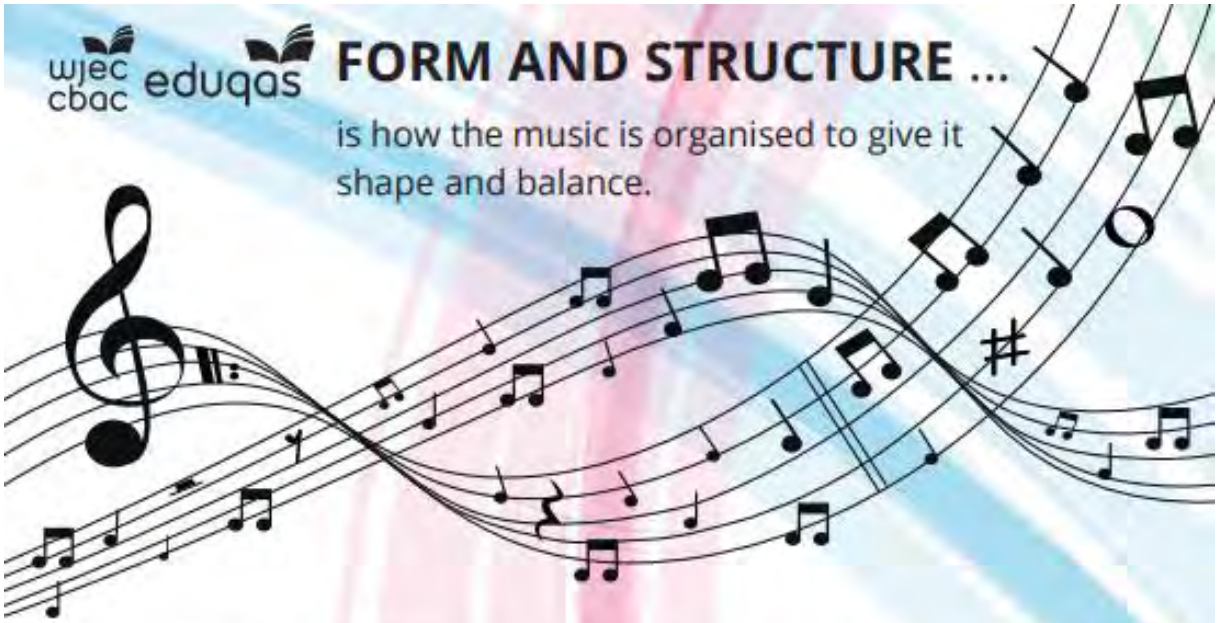
The majority of the song is in **B major** whilst the choruses are all in **A major**.

Tempo:

The tempo is **moderately fast**.

FORM AND STRUCTURE ...

is how the music is organised to give it shape and balance.



Each section in the music is usually labelled with a capital letter, i.e. A, B, C, and so on.

Binary: A B

Strophic: A A A

32 bar song: A A B A

Ternary: A B A

Theme and Variation:

Main theme
Variation 1
Variation 2
Variation 3
etc.

Minuet and Trio:

|: A B :|:C D :|A B

Rondo:

A B A C A

12 bar Blues:
A repeated chordal pattern

I	I	I	I
IV	IV	I	I
V	IV	I	I

Some structural sections:

Introduction (Intro) - Opening of a piece which introduces the main ideas.
Outro - Last part of a piece used in 'pop' music.
Coda - Final section of a piece of music.
Bridge - Piece of music that links two other sections together.
Break - Section that offers a contrast or 'break' from the rest of the piece/song.
Verse - Section of a song which has the same music but different lyrics when repeated.
Chorus - Section of a song which has the same music and lyrics when repeated.
Middle 8 - Eight bars in the middle of a song which provide a contrast.

Some structural devices:

Regular phrasing - Melody divided up into balanced, symmetrical phrases.
Irregular phrasing - Melody divided up into unbalanced phrases.
Riff - Catchy idea in 'pop' music which is repeated.
Fill - Idea that fills in the 'gaps' at the end of phrases.
Ostinato - Continuously repeated phrase or idea.
Call and response - Short musical idea followed by an answering phrase.
Loop - An idea continuously repeated by technical means.
Repetition - When an idea is repeated.
Contrast - A change in the music which offers a difference in the musical elements to provide contrast to the initial material.

HARMONY is...created through chords in music.

CONSONANT HARMONY:

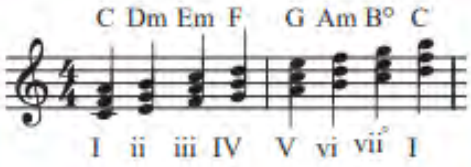
when the notes sound 'good' together.

DISSONANT HARMONY:

when the notes 'clash'.

DIATONIC HARMONY

is based on the major / minor scale system - triads are built on every note of the scale:



CHROMATIC HARMONY

Chromatic harmony is far more complex and includes accidentals not belonging to the home key.

Every one of the 7 notes, (or DEGREES) of the scale is given a name:

7th note: **LEADING NOTE**
6th note: **SUBMEDIANT**
5th note: **DOMINANT**
4th note: **SUBDOMINANT**
3rd note: **MEDIANT**
2nd note: **SUPERTONIC**
1st note: **TONIC**

A CADENCE is a progression of two chords, found at the end of a musical phrase.

PERFECT CADENCE: *Uses chords* **V → I**
Sounds complete and always stops on the tonic chord. Both chords are major.
IMPERFECT CADENCE: *Lands on chord* **V, e.g. I → V; ii → V; IV → V; vi → V**
Sounds incomplete. The 2nd chord is always chord V of the key, which is major.
The chord before may be major or minor.
PLAGAL CADENCE: *Uses chords* **IV → I**
Sounds complete and finishes on chord I. Both chords are major.
It is sometimes known as the 'Amen' cadence because it is often found at the end of a hymn.
INTERRUPTED CADENCE: *Uses chords* **V → vi**
Sounds incomplete. In a major key, it involves a major chord moving to a minor chord. It is sometimes known as a 'surprise' cadence, because it seems as if chord V will resolve to chord I, but it does not - stopping instead on a minor chord.

MELODY is...

a line of musical notes with varying pitches that is satisfying to listen to.

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Anacrusis:
a note (or notes) that come before the first strong beat in a piece. Sometimes called the 'up-beat' or 'pick-up'.

Motif:
a short melodic or rhythmic idea.

Leitmotif:
a recurrent musical idea representing a person, place, feeling or idea.

Countermelody:
a 2nd melody played at the same time as the main theme.

Pitch:
whether the musical notes are high, middle-sounding or low.

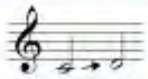
Range:
the distance from the lowest sounding note to the highest sounding note in a piece of music.

Ornaments:
used to 'decorate' the music, e.g. trill, mordent, turn.

Chromatic:
when the tune moves in semitones (like a chromatic scale).

Pentatonic:
a musical scale based on 5 notes.

Intervals:
distance between 2 pitches

Microtone	smaller than a semitone
Semitone	
Tone / major 2nd	
Major 3rd	
perfect 4th	
Perfect 5th	
Major 6th	
Major 7th	
Perfect 8th (Octave)	

Question and answer phrases:
an initial idea (the questioning phrase) balanced by a 2nd idea (the answering phrase).

Theme:
the main musical idea in a piece of music.

Sequence:
repetition of a musical idea at a higher or lower pitch.

Imitation:
when a musical idea is copied in another part.

Repetition:
when musical ideas are repeated.

Contrast:
when there is some type of difference in the music.

Fanfare:
a musical 'announcement', based on the pitches of a chord.

Blue notes:
the flattened notes in a Blues scale.

Types of scales:
Major, Minor, (up to 4 sharps and flats), Pentatonic, Blues.

Useful terms and their meanings

Conjunct:
Stepwise movement in a melody (scalic).

Disjunct:
When the melodic movement includes lots of leaps or intervals.

Arpeggio / broken chord:
When the notes of a chord are played separately and in succession.

Anticipation note:
When a note of the next chord is played early, preparing for the intended pitch in the chord.

Triadic:
Musical movement that uses the notes of a triad.

Pentatonic melody:
Melody based on a 5-note scale.

METRE

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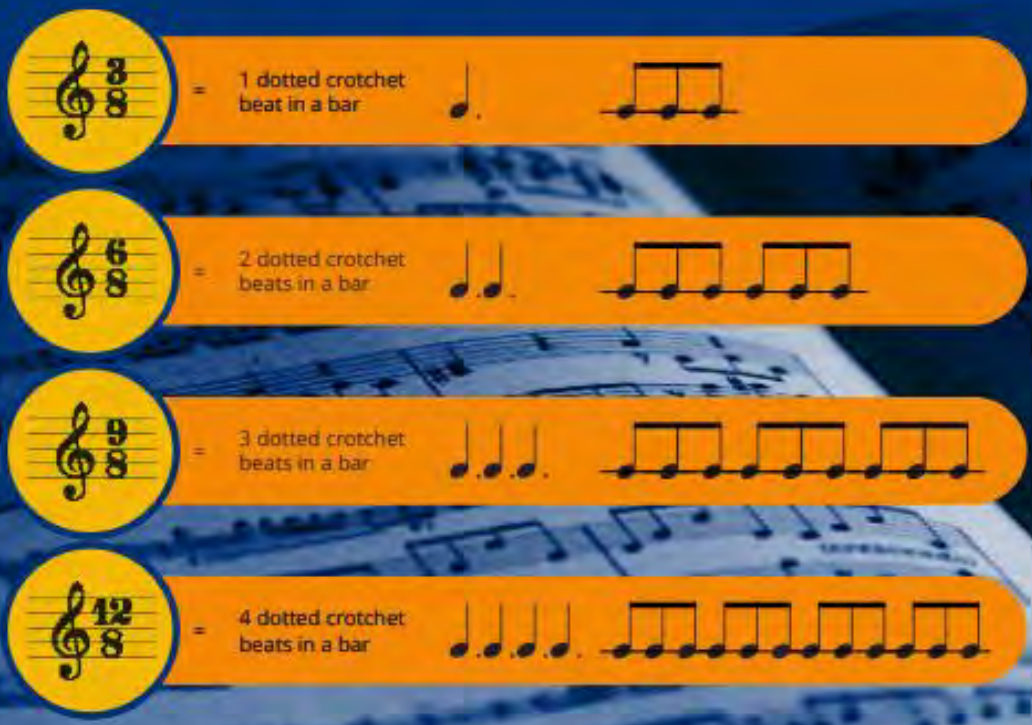
Simple Time

counts crotchet beats in every bar.

Compound Time

counts dotted crotchet beats in every bar.



MUSICAL STYLES

...are the different types of music

AOS 1: Musical Forms and Devices

BAROQUE ERA
(1600 – 1750)

CLASSICAL ERA
(1750 - 1810)

ROMANTIC ERA
(1810 - 1910)

AOS 2: Music for Ensemble

JAZZ AND BLUES

MUSICAL THEATRE

CHAMBER MUSIC

AOS 3: Film Music

Music to accompany film or television scenes - appreciating how musical elements are used to create the mood and atmosphere through engaging with the story.

AOS 4: Popular Music

Rock	Hip-Hop	
Pop	Ballad	
Soul	Reggae	
Fusion	Minimalism	Bhangra

Rhythm is ...

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the way the time values and patterns of notes are organised and used.

Note	Note name	Rest
	Semibreve (4 crotchet beats)	
	Minim (2 crotchet beats)	
	Crotchet (1 crotchet beat)	
	Quaver (½ crotchet beat)	
	Semiquaver (¼ crotchet beat)	

Syncopation / 'off-beat' ...is when the strong accent is placed on a normally weak beat.

On the beat ...is when the accents are on the strong beats, e.g. the first beat of the bar.

Dotted notes ...a dot placed after a note adds half the original value to the note.

Triplets ...when 3 equal note values are played in the time of 2 note values.

CHAAL is an 8 note dotted rhythmic pattern found in **BHANGRA**.

Tied notes ... *are two notes of the same pitch joined together by a short curved line called a tie.*

Swing rhythms give a dotted / triplet rhythm feel to the beat.

Driving rhythms are energetic, 'driving' the music on.

Dance rhythms are typical rhythms of any kind of dance.

Rock rhythms are rhythmic riffs and patterns associated with 'rock' music.

SCALES

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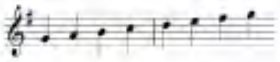
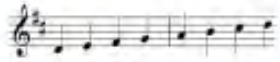
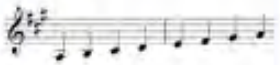
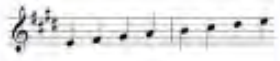
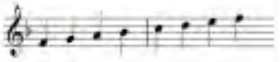
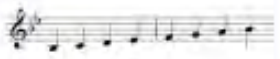
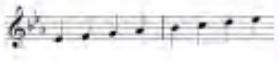
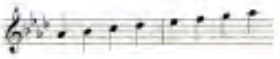
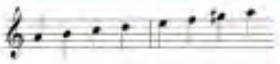
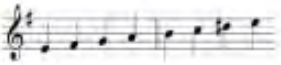
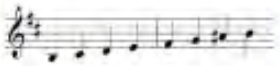
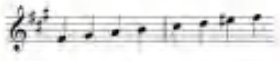
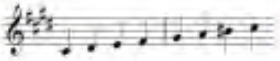
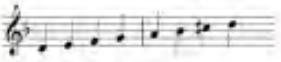
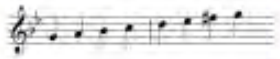
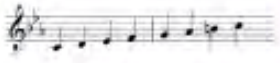
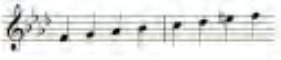
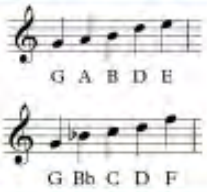
MAJOR sounds are happy / bright.

Key	Scale
C major	
G major	
D major	
A major	
E major	
F major	
B♭ major	
E♭ major	
A♭ major	

MINOR sounds are sad and rather mournful.

Key	Scale
A minor	
E minor	
B minor	
F# minor	
C# minor	
D minor	
G minor	
C minor	
F minor	

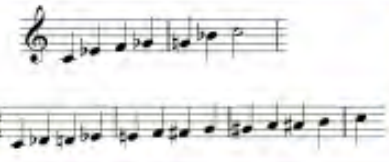


The **major pentatonic** uses notes 1,2,3,5 and 6 of a major scale.

The **minor pentatonic** uses notes 1,3,4,5,7 of the natural minor scale.

Blues scale in C

Chromatic scale on C



SONORITY...

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is all about the quality of sounds in music – the types of voices, instruments and technology and how they are used.

Percussion: Timpani, Drum Kit, Snare Drum, Cymbal, Hand Held Percussion, Glockenspiel, Xylophone, Tabla, Dhol

Rim shot – when the rim and head of the drum are hit at the same time.
Drum roll – beats played in a rapid succession.

Brass: Trumpet, French Horn, Trombone, Tuba

Muted – when mutes are used to 'dampen' the sound.

Woodwind: Flute, Oboe, Clarinet, Saxophone, Bassoon

Slurred – joining notes 'smoothly'.
Tongued – notes are separated, sounding 'defined'.

Voices: Soprano, Alto, Tenor, Bass

A cappella – without accompaniment.
Humming – vocal sound made with closed mouth.
Syllabic – one note for each syllable.
Melismatic – each syllable has a number of notes.
Vibrato – rapid, slight variation in pitch.
Falsetto – male voice in a higher range than usual.
Belt – lower, more powerful part of voice range.
Rap – words spoken in a rhythmical way.
Scat – jazz singing, no words or nonsense words.
Backing vocals – singers providing extra harmonies.

Strings: Violin, Viola, Cello, Double Bass, Harp

Pizzicato – 'plucked'.
Double stopping – one instrument playing 2 notes at the same time.
Tremolo – rapid bowing to give a dramatic effect.
Divisi – 2 parts in the same musical line.
Arco – 'bowed'.
Mutes – used to 'dampen' the sound.

Guitars: Classical / Spanish, Electric + Bass guitars, Sitar, Saranga, Tumbi

Distortion – effect which 'distorts' notes.
Hammer-on – finger brought down sharply on a string.
Slap bass – bouncing strings against the fret board.
Pitch bend – altering pitch of a note very slightly.

Keyboards: Piano, Organ, Harpsichord

TEMPO is...

the speed of the beat.

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Allegro Vivace	Fast / Lively / Quick
Moderato Andante	Not too slow / at a moderate pace, a 'walking' speed
Allegretto	Moderately fast
Adagio Lento	Slow / Leisurely

Accelerando gradually getting faster.

Ritardando / Rallentando slowing down.

Rubato a 'freer' interpretation of the tempo.

Pause a symbol which means the note must be held for longer than its original value.

Some other useful terms:

Presto	–	very quick
Largo	–	very slow
A tempo	–	in the original tempo
Ritenuto	–	in slower time

TEXTURE is...

the way that the melody, chords and musical ideas have been woven together to achieve different effects – the 'layers' of music and how they relate to each other.

Monophonic

A single melodic line with no harmonies or other melodies. It may be sung or played by more than one voice or instrument.

Homophonic

A chordal style, or a melody plus chords, which sometimes provide a rhythmic contrast.

Polyphonic

A more complex style which presents the melody (or melodies) in imitation or in counterpoint.

Unison:
When all parts are playing the same music at the same pitch

Chordal:
When parts move together creating a succession of chords

Drone:
Constantly repeated or sustained note(s)

Stab chords:
Short, 'staccato' chords that add impact and 'punch' to the music

Imitation:
When one part 'copies' another

Counter-melody:
A new melody, combined with the theme

Descant:
A decorative (higher) line added to the main tune

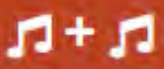
Round:
A short (vocal) canon

Canon:
When the melody is repeated exactly after the first, with some overlapping

Alberti Bass:
A type of accompaniment figure that uses broken chords

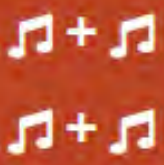
Walking bass:
A steady, continuous, mainly stepwise bass line

2-part texture:
Music written for 2-part voices or instruments



3-part texture:
Music written for 3-part voices or instruments

4-part texture:
Music written for 4-part voices or instruments



Tonality

is... the key of the music – it depends on the types of scales used.

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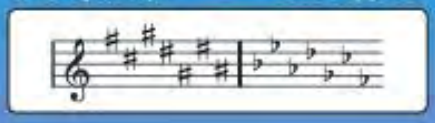
You must know the key signatures in all the major and minor keys up to four flats and four sharps. These scales are what the music is based on.

order of sharps *order of flats*



order of sharps →

F C G D A E B

← *order of flats*

THE PENTATONIC SCALE

This type of scale is made up of five notes within the range of an octave.

For example:

MODULATION is when the music changes key.

Modulation to the dominant is when the music moves from the tonic to the dominant key. The dominant key is based on chord V of the original key, e.g. from C major to G major.

Modulation to the relative minor key is when the music moves from the tonic major key to the relative minor key. The relative minor key is the minor key which shares the key signature with the home key, e.g. the relative minor of C major is A minor.

Modulation to the relative major key is when the music changes from the tonic minor key to the relative major key. The relative major key is the major key which shares the key signature with the home key, e.g. the relative major of A minor is C major.

Key signature	Major keys	Minor keys
No flats or sharps	C major	A minor
1 sharp (F#)	G major	E minor
2 sharps (F#, C#)	D major	B minor
3 sharps (F#, C#, G#)	A major	F# minor
4 sharps (F#, C#, G#, D#)	E major	C# minor
1 flat (B♭)	F major	D minor
2 flats (B♭, E♭)	B♭ major	G minor
3 flats (B♭, E♭, A♭)	E♭ major	C minor
4 flats (B♭, E♭, A♭, D♭)	A♭ major	F minor

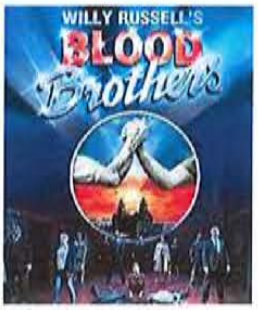
Performing Arts

BLOOD BROTHERS

PROCESS	ROLES, RESPONSIBILITIES, SKILLS
Script (book) is written Music was added to the script	Willy Russell wrote the script based on a story he read as a child "about two babies switched at birth" as a school play for pupils at Fazakerley Comprehensive School in Liverpool 1981. He later wrote and added the music and lyrics and this was first performed at the Liverpool Playhouse in 1983.
Auditions and casting sessions	Actors would prepare for an audition by rehearsing parts of a script and learning a song. The Director and Musical Director would audition the actors and then make casting decisions. They would consider actor's experiences, skills, actual audition pieces, chemistry between actors, ability to use a Liverpudlian accent
Research	The Director would begin breaking down the script and analyse and explore content. Director would research Liverpool in the 1960s (clothes, employment etc). The Director would begin to develop a vision of how he wanted the production to look. Actors would also begin to research their role.
Production Meeting	Director shares his vision with the team consisting of the creative team (set and props design, costume and make up designers) and technical team (the lighting and sound designers).
A rehearsal schedule is organised and planned and given to whole company (cast and crew)	The Director plans out the rehearsals. Rehearsals would be conducted scene by scene in chronological order so everyone can see how the story develops / ends. Dates for technical and dress rehearsals would also be planned ahead of the first performances.
Read through	The cast, Director and Musical Director gather at first rehearsal; a read through of the entire script from beginning to end. This is the first opportunity for everyone to meet and begin to form bonds. Each actor reads their lines, for example the character playing Mickey would read all of Mickey's lines out loud. The actors use some of their research when reading the lines, for example ... The Director shares his vision of Blood Brothers with the cast. Some Directors use Brecht's influence (multi-rolling, eg narrator plays milk man, catalogue man and changes happen on stage.
Rehearsals	Rehearsals are usually organised in chronological order so that everyone sees story develop. Some rehearsals would require the whole cast, for scenes like the beginning where we see the end of the play in the courtroom with the song 'Tell me it's not true' and some may just need one or two actors eg Mickey and Eddie. Actors would use their scripts in rehearsal to start with but would then go 'off book' after a few weeks. Lines would be given by stage manager if forgotten. The Director blocks the scenes (tells the actors where to stand / where to move to, and gives advice on how to say lines or how to react. After full cast rehearsal the Director reads out his notes to the entire cast and explain what was good and what needs to improve or change. The Musical Director would run separate musical rehearsals so actors can learn the songs / harmonies before trying to act and sing together in a full rehearsal on stage. Dance and Music rehearsals may be held in different places such as dance studios.
Costume fittings	During the rehearsal period actors would attend costume fittings in order to check that sizes of costumes fit the actors. It would then be the costume designers' job to make adjustments / amendments to the costumes before the next fitting.
Technical Rehearsal	The full cast and crew walk through the entire show in performance order making sure that every lighting cue, sound effect and microphone is working properly and is used at the correct time. The actors do not act or sing as this rehearsal is just for the technical team (lighting and sound). The cast will be in costume so that lights and microphones can be adjusted if necessary. Usually lots of things go wrong at technical rehearsals and it's the job of the tech team to problem solve and fix issues.
Dress Rehearsal	This is a full run of the show before the first performance. The show is performed from start to finish with no stops. Sometime an audience is invited in order to provide feedback to the Director before the first performance. The Director watches the show from the theatre seats and makes notes. These are read to the whole company at the end of the performance.

Script synopsis

Description of storyline and what happens in the work



Initial thoughts and First Impressions

Write about the moments you found interesting, moving and enjoyable

(Avoid making negative points; demonstrate an appreciation for the professional work and why it would rch a large audience)

Style / Genre – Originally a play, but adapted into a musical; in style of Epic Theatre (could link also to genre of tragedy)

Explain all terms book musical, epic theatre, tragedy – what are the general features of these styles?

eg. a musical usually has a story that is punctuated by songs and features dialogue in between the songs.

Practitioners influences - Brecht

Give a brief outline of who Brecht was and how and why he created this style of theatre. What were his beliefs? What did he want his audiences to feel? How did he intend to do this? He was against naturalism and believed that if the audience became emotionally engaged with the characters onstage, then they lost the ability to think and judge. He wanted audiences to remain objective and not get emotionally involved so they could make considered and rational judgement about the social or political issues in his work - verfremdungseffekt.

Links to Repertoire – An important section!

Just from opening the script and looking at the format... What links can you make to the style / genre section?

Explain in detail how elements of the work link to the style

- Use of a narrator (reminds people they are watching a play and breaks fourth wall. Narrator often tells audience what happens before they see it)
- Start of play reveals fate of twins (starts with the ending) – removes the what ifs from the play, allowing audience to focus on themes and issues of social class rather than storyline)
- Lots of detail in stage directions
- Minimal props
- Actors change costumes on stage
- Political / social message (nature versus nurture)
- Stereotypical characters – representations of characters from different classes and adults playing the young boys
- Multi-rolling narrator sometimes plays the milkman, catalogue man etc
- Is Spass included via use of Mickey's monologue?

Themes & Context

- Social class, Education, Nature vs Nurture, Fate and destiny, Growing up, Men and Women, money, superstitions, relationships between characters (links with the brief)
- When / where is it set? – what was it like in Liverpool during 1950s – 70s (culture / education/ employment / social classes etc – try to explain where Willy Russel got inspiration from and what he based ideas on

Performance Purpose

- Give info about the background – why was it written, when, who for? How did it develop? Where did inspiration come from?
- Purpose: To educate, inform, entertain, provoke, challenge viewpoints, raise awareness, celebrate?
- What is the audience supposed to feel: excited, thrilled, scared, educated, entertained, emotionally moved, relaxed etc

Staging / Lighting / Costume Design

Add a range of images and explain / annotate each one – why has director chosen this? Connect it to style / genre

Roles and Responsibilities (A2)

- Explain the job roles required for Blood Brothers and describe the responsibilities and skills required for each one (use specific examples from the work)

LEARNING AIM B - PRACTICAL — BLOOD BROTHERS

Participate in workshops and classes to develop knowledge and understanding of the processes, techniques and approaches that contribute to performance material.

(Focus on the journey that the work takes from the initial ideas to the performance)

In the beginning....

- Describe the process Blood Brothers followed from being an idea to becoming a hit musical on Broadway and West End: The script was written by Willy Russell for a school play at Fazakerley Comprehensive School in Liverpool November 1981 and then he wrote a score (music) and developed it into a musical in 1983 for first performance at the Liverpool Playhouse.
- Explain how it went from this performance in Liverpool (home town of scriptwriter) to major world wide success! What is it about this play / musical that appeals to audiences / actors? Any facts or figures about numbers of performances / quotes from reviewers?
- For each production or tour, there would be auditions and casting, Read through of the script with actors, then rehearsals probably in chronological order. (Explain what happened at each stage of rehearsal)
- Different rehearsals (production stage (decide on props, costume, staging), technical rehearsal, dress rehearsal, performance, post-performance evaluation / review)

TIP: show your knowledge of each stage (what happens and why?)

TIP: Explain the skills and responsibilities used at each stage by the various roles (director – what is their role during read through / rehearsals and recordings?

Actors – what are they expected to have done prior to scene rehearsals for stage musical? Need to be physically fit, have good singing voices and vocal skills, good breath control, and learn any blocking / choreography quickly

Where to start?

-Describe our **process** – read through whole script, pausing at times to discuss storyline and characters (Some of you have studied this also is English – mention this and what you have done, some of you have researched / watched more clips in your own time – mention this and why you did it, what you gained? Watched stage version (recorded at The Venice Theatre under direction of Allan Kollar (look up on You Tube for list of production team (job roles and names) **Give own opinions about this performance and individual actors' portrayal of their characters, especially sections where men play boys (links to Brecht's epic theatre)**

- Nature versus Nurture lesson (exploration of themes in the play). Practical activities using levels to show authority (master and servant) – links to social class; discussion of how Mickey's and Eddie's lives are different and why- links to idea of nature versus nurture, read through and rehearsal of monologue (Mickey and Eddie or Mrs Johnstone and Mrs Lyons to show idea of social class and task was to use levels to show authority and social class.) – performance, film, and evaluate.

- **Casting** and **read through** of chosen scenes- discussion with actors about characters. **(OR completed role on the wall sheets for Mickey and Eddie and Mrs Johnstone and Mrs Lyons to show costume and how this could be used to show social class)** (why? – responded to stimulus (script) to get ideas for performance – how did you try to keep your performance close to Brecht's idea of Epic Theatre?

Performed the scenes to teacher (every director will have a different interpretation) What is the role of the teacher / director here? Did anyone else direct?) (explain what is needed for a rehearsal - stage and space laid out correctly and constant use of script and stage directions)

(explain what is required of actors – learning lines, use of correct mannerisms, use of props and staging, good vocal, singing and dance skills)

- **(Compare our version of this scene to the professional one (staging/ set / props / acting skills / choreography required and success!)**

Linking back to the Brief – Relationships

Consider how the relationships are presented by writer / director / actors themselves or you (use of spatial awareness / blocking in song, use of staging / specific words – don't forget to give examples)

PE

Year 10 PE Spring Knowledge Organiser

In the spring term, students will learn to plan and implement tactics, can demonstrate a variety of communication techniques, and perform advanced skills with control and consistency.

Head

Plan and Implement

Students will learn what it means to plan and implement (put in place) tactics in a competitive situation.

For example:

In badminton - the tactic could be to play to the space to make the opponent run more.

In basketball – the tactic could be passing wide on the court to make use of the space.

Have a think about other sports, and what tactics you could use in them.

Heart

Communication

Showing good communication in a variety of ways is an important skills to have.

Verbal communication is the most common type, using clear concise language and words that most can understand.

What do you think non-verbal communication might be? Think about other things you could do besides talking to someone.

Hands

Control and Consistency

Students will learn to improve performance of skills by showing good control and consistency.

<u>Control</u>

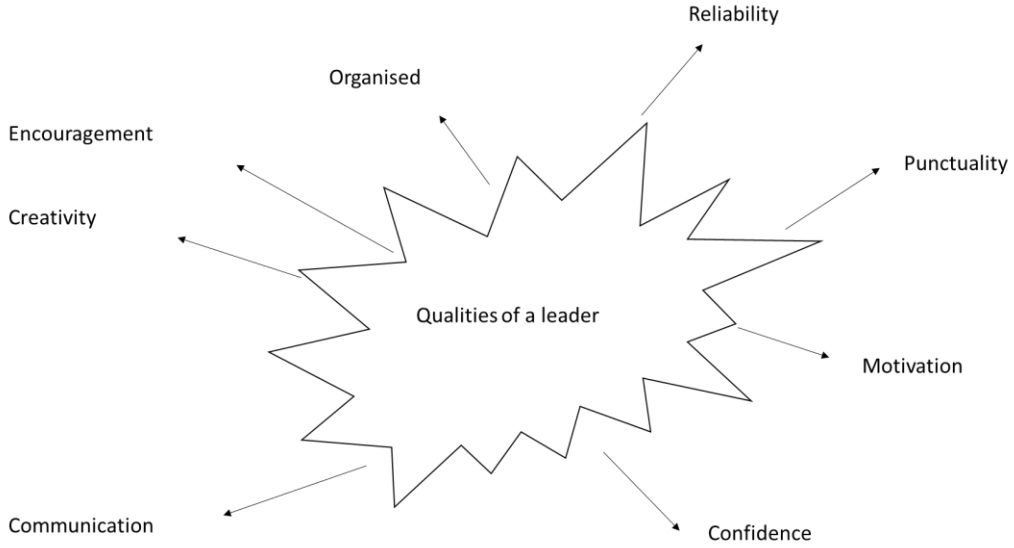
Knowing exactly how to perform the skill, and move the body and limbs in the correct place to ensure the skill is completed

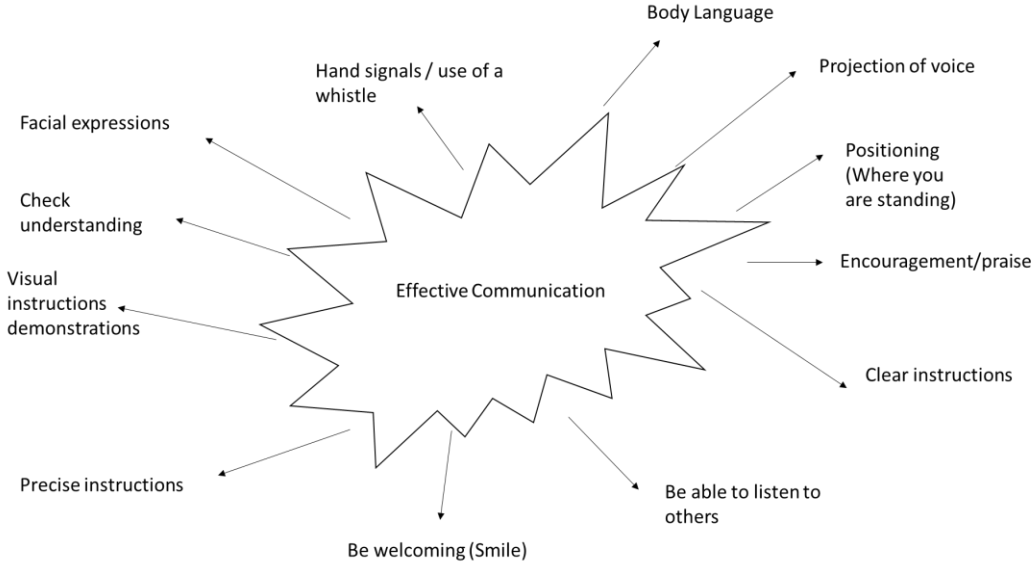
<u>Consistency</u>

Repeating the skill over and over again, with correct technique and control.

Sports Studies

Year 10 CNAT Sport Spring Knowledge Organiser





Democratic Style:
The leader will facilitate decision making and goal setting with the input of the athlete. The athletes will have input but the coach/leader will have the final decisions.

Laissez-faire Style:
The leader will make only a few decisions which gives the participants freedom to make the decisions about their learning and development within the session.

Autocratic Style:

The leader gives the instructions and the participants follow the instruction.
Used especially when safety needs to b considered.
E.g. throwing a javelin, refereeing a football game where decisions need to be made quickly and stuck to

Year 10 CNAT Sport Spring Knowledge Organiser

Review the planning of the session/lesson:
The suitability of activities for the group
Taking into account the different abilities
Were the order of the activities correct? Did they increase from easy to hard?
Did you plan for enough equipment for the number of participants in the group

Review the leading of the session:
Leadership qualities
Adapting the session – did you have to make changes to what you planned when leading the session
Did you position/stand in the correct place when leading your session
Did you use the space effectively

Improvements that could be made:
Leadership qualities
Adapting the session – did you have to make changes to your plan
Did you position/stand in the correct place when leading your session
Did you use the space effectively
When planning your next session what would you do differently

Opportunities to develop leadership skills:
Attending coaching/leadership courses for the sport of…..
Help in PE lessons with the …..
Help at extra-curricular clubs

Year 10 CNAT Sport Spring Knowledge Organiser

Performance in 2 activities: (Individual Sport)

- Perform a range of skills in selected sports
- Perform a range if techniques in selected sports
- Demonstrate the ability to use tactics, strategies, creativity to outwit opponents
- Decision making during performance
- Ability to maintain own performance
- Perform a specific role within a team sport.
- he suitability of activities for the group

Practical Logbook to record each sport/activity: (Individual Sport)

Record evidence in a log book to recording how you have got on at each sport/activity this must include:

- At least 20 entries for each sport
- The skills that you performed
- How well you performed the skills
- How well you performed in the game (Win, lose, Draw)
- What do you still need to work on

Year 10 CNAT Sport Spring Knowledge Organiser

Review Practical Performance :

- **Review strengths and weaknesses**
  - Level of ability
  - Why skills are strengths/weaknesses
  - Type of skill
  - When these skills are important in the chosen sport
  - How they will impact on your performance or during training

- **Methods to improve**
  - Progressive practices/drills
  - Different types of practice, fixed/variable/whole or part practice
  - Could play with more or against better players

- **Measuring Improvement**
  - Video analysis
  - Activity tracker
  - Monitoring competition results over a period of time

Types of skills:

Open Skills:
An open skill is usually affected by the environment as this is something that can be ever changing, this meaning that how the skill is performed will have to be adapted when performing it.

Closed Skills:
Closed skills are skills that are predictable in a stable environment where it doesn't change.

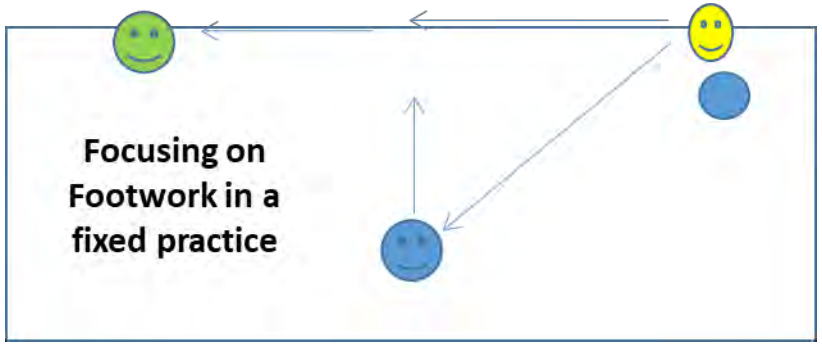
Simple/basic skills:
Simple skills are those that don't require much processing or thinking about. The skill will only have a small number of parts.

Complex Skills
Complex skills are those that are made up of sub-routines and require lot of decisions to be made.

Year 10 CNAT Sport Spring Knowledge Organiser

There are 4 types of practices that will support your weaknesses when creating drills;

1. **WHOLE** – The whole skill is performed at once (e.g. triple jump)
2. **PART** - The skill is broken down into parts which are practised separately (e.g. front landing in trampolining)
3. **VARIABLE** – The skill is practised in the range of different situations that could be experienced in a performance (e.g. short corners in Football)
4. **FIXED** – Specific skill or technique is repeatedly practised in the same way.



Statistics

GCSE STATISTICS FORMULAE (9-1 EDEXCEL)

Formula in green boxes are given in exam.

Refer to your Revision Guide for all topics.

Petersen capture-recapture $\frac{M}{N} = \frac{m}{n}$

M = original marked

m = new marked

n = new population

$N = total\ population$

Mean $(\bar{x}) = \frac{\sum x}{n}$

Weighted mean = $\sum(value \times weight)$

Skew = $\frac{3(mean - median)}{standard\ deviation}$

Standard deviation (not table):

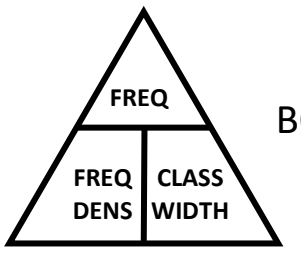
$= \sqrt{\frac{\sum(x-\bar{x})^2}{n}}$ or $= \sqrt{\frac{\sum x^2}{n} - \left(\frac{\sum x}{n}\right)^2}$

Standard deviation (frequency table):

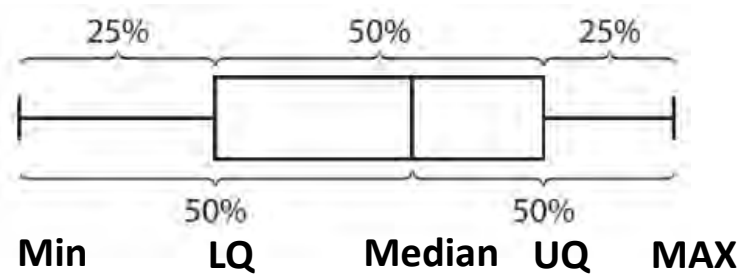
$= \sqrt{\frac{\sum f(x-\bar{x})^2}{\sum f}}$ or $= \sqrt{\frac{\sum fx^2}{\sum f} - \left(\frac{\sum fx}{\sum f}\right)^2}$

Histograms →frequency is area of the bar

Frequency density = $\frac{frequency}{class\ width}$



BOX PLOT



For a set of data:

- mean > median > mode = positive skew
- mode > median > mean = negative skew

Spearman's rank correlation coefficient:

$$r_s = 1 - \frac{6\sum d^2}{n(n^2-1)}$$

Small **outlier** is less than LQ – (1.5 x IQR)
Large outlier is greater than UQ + (1.5 x IQR)
OR mean $+3\sigma$ (σ = standard deviation)

Line of best fit should go through the mean point $(\bar{x}, \bar{y})$

The equation of the line $y = ax + b$

- has gradient a
- intercept on the y axis is (0, b)

Seasonal variation at a point = actual value – trend value
Estimated mean seasonal variation for any season = mean of the seasonal variations for that season
Predicted value = trend line value + estimated mean seasonal variation

Probability of an event (if possible outcomes are equally likely)

= $\frac{number\ of\ successful\ outcomes}{total\ number\ of\ possible\ outcomes}$

Expected frequency of event A = P(A) x number of trials

Estimated probability = $\frac{number\ of\ trials\ with\ successful\ outcomes}{total\ number\ of\ trials}$

Risk of event = $\frac{number\ of\ trials\ in\ which\ event\ happens}{total\ number\ of\ trials}$

Relative risk for the group= $\frac{risk\ for\ those\ in\ the\ group}{risk\ for\ those\ not\ in\ the\ group}$

Mutually exclusive, A and B: P(A∪B) = P(A) + P(B)
Exhaustive events: P(A) + P(not A) = 1 or P(not A) = 1 – P(A)
General addition law (for not mutually exclusive):
P(A∪B) = P(A) + P(B) – P(A∩B)
Independent events, A and B:
P(A∩B) = P(A) x P(B); P(A∩B∩C) = P(A) x P(B) x P(C)
Conditional probability, probability of B given A:

$P(B|A) = \frac{P(A \cap B)}{P(A)}$

$P(A \cap B) = P(B|A) \times P(A)$

Two independent events A and B: P(A) = P(A|B)

Index numbers = $\frac{price}{base\ year\ price} \times 100$

Weighted index numbers = $\frac{current\ weighted\ mean\ price}{base\ year\ weighted\ mean\ price} \times 100$

Chain base index numbers = $\frac{price}{last\ year's\ price} \times 100$

Normal distribution:
68% $\pm$ one standard deviation of the mean
95% $\pm$ two standard deviation of the mean
99.8% $\pm$ three standard deviation of the mean

Normal distribution N(μ, σ^2)
Mean (μ) and variance (σ^2)
Variance = $(standard\ deviation - \sigma)^2$

Warning limits set at $\mu \pm 2\sigma$
Action limits set at $\mu \pm 3\sigma$

Standardised score = $\frac{score - mean}{standard\ deviation}$

Binomial distribution = B(n, p)
Binomial expansion = $(p+q)^n$
Mean of binomial expansion = np

Travel and Tourism

Travel & Tourism - Component 2 Knowledge Organiser

Types of Customer

Internal Customers
Definition: "Those who you directly or indirectly work with to ensure excellent service is given to external customers."
- Colleagues and staff with whom you work closely
- Supervisors and managers
- Directors and Owners
- Staff at other locations
- Suppliers

Groups
- Customers might be an in organised group (usually have a leader)
- If the group has a leader work with them to fully understand the groups needs
- Be alert to individual needs if the group doesn't have a group leader as people may want to ask questions

New customers
- If the organisation is new, then customers are new. You need to keep them coming back for more!
- The organisation will also be unfamiliar with the needs, wants and desires of new customers

Individuals
- Discover whether they will know someone else on the holiday
- If they want to be on their own?
- If they are on holiday, they might want to check in from time to time with a holiday rep.
- Some might want to be left alone.

Business Travellers (Corporate Customers)
- Want quick and efficient service
- They need facilities and support to allow them to do their job.
- They might also want something that reflects that of a leisure traveller ie jet lagged customers

Additional Physical Needs
- Not every disability is visible
- Make sure that their needs are catered for and their disability (physical or mental)
- Can also include dietary requirements

Couples
- Couples may be travelling just as couple or as part of a group.
- They may want to have privacy or to join in with others.
- We as travel experts need to find this out and cater to their needs.

Age Groups
- You will meet different ages of people from the young to the old
- Some adults will want child free zones
- Parents will appreciate help with their infants and young children.
- Older generations might appreciate a more formal style of delivery i.e. sir or madam

Existing Customers
- If the new customer is happy, they will come back.
- The organisation must continue to deliver products and services which the customer wants.
- External changes may also impact on customer wants such as technology or new destinations etc.

Special Interests
- They usually have special interests.
- Find out more about their hobbies to get to know their interests and dislikes to then cater the holiday around them.

Important to remember:
Customer service is only possible if everyone in the organisation (whether or not they have direct contact with the external customer) aims to give customer satisfaction. It is like a chain.

Families
- Huge part of the travel industry
- Normally have one family member who leads the holiday.
- Talking to the children will also help and allows them to share their excitement of their holiday

Culture and Ethnicity
- Prevalent in the inbound sector
- Different ethnicities have different needs and wishes.
- Respect their values and wishes
- Ignorance can lead to people taking offence

Travel & Tourism - Component 2 Knowledge Organiser

Safety

The Health and Safety at Work Act (1974) places a responsibility upon employers and employees to ensure the safety of ourselves and others.

Hotels must have evacuation procedures in every bedroom and coach drivers must remind customers to wear seat belts.

Advice

Customers will look to you for advice. You are considered the expert. Examples might be...

- A train manager might be asked which side to sit on for the best views
- A hotel receptionist is asked how to get to a venue by a customer who missed their coach

Specific Needs

Some customers have special needs. It may be because of a disability. They may need help to an easy access room or a wheelchair to take them to and from their transport. They may need an induction loop to help them hear in public areas, or an escort because they are partially sighted. They might have a dietary issue.

Products and Services

- Make sure you know what products and services your organisation offers and what the benefits of them are.
- Learn about your competitors' products and services so that they can emphasise to your customers what your organisation offers that your competitors don't.
- The customer expects the product or service they purchased delivers what your organised promised.
- Remember your 3P's (Product, Process and Personal Behaviour)
- It is not just about the flight and hotel that is booked, it is about the personal service you're providing. Are you knowledgeable, friendly and responding appropriately to what they have to say?

Needs of different types of Customer

Security

Bag checks are now more prominent than ever before due to recent terrorist activities. There is a increase in CCTV, security guards and body and baggage searches. If you are working in the industry, we need to be extra vigilant and reporting anything suspicious

Special Requests

Special requests may also increase a customers enjoyment e.g. a bottle of champagne in a bridal suite for a honeymoon couple or a birthday cake arranged for a child's birthday.

Accurate Information

Customers expect accurate information. They need to know that the product/ service meets their needs and how. Examples might be...

Can you give me directions to...?

At what time is the next show starting?

What is the weather forecast for this afternoon?

Assistance

People might require assistance with different things such as...

- Baggage in their holiday destination
- Elderly customers climbing stairs and many more

Health

The customers rely on you to be kept safe, secure and healthy whilst in your care.

You need to alert customers to overseas health requirements. These are usually available from the FCO

SARS, Avian Flu, Swine Flu and Coronavirus has had restrictions on travel, each time this information was shared through the WHO (World Health Organisation)

Travel & Tourism - Component 2 Knowledge Organiser

Responding to Customer Needs

Verbal Requests

- Verbal requests might be face to face
- They might also be over the telephone
- Staff must listen carefully to what the customer is saying or asking and be prepared to respond helpfully, knowledgeably and clearly

Written Requests

Much communication in Travel and Tourism is doing via email or websites. However some customers still prefer to communicate by letter and written booking form.

- The style and sometimes the information can differ depending on method of communication
- Make sure that dates are correct
- Make sure you sign the letter off correctly eg yours sincerely, yours faithfully.

Recognising unstated needs

Sometimes a customer doesn't realise they have a need, so it is our job to identify those unstated needs. Some examples might include...

A family with children booking a holiday at a travel agent might want a kids club option.

Cabin crew reminding someone to fasten their seatbelt

A cruise ship waiter noticing someone not eating their meal because they are in fact vegetarian and are too shy to request a change.

Booking Forms

Many tour operators are now offering online booking forms. We must make sure that they are...

- Easy to read
- Ask all the questions which the organisation needs to be answered.
- Provide the information the customer needs
- Is clear and unambiguous

Exceeding Expectations

- Anticipate the customers needs before they ask for it.
- Personalise the experience for the customer, get to know them
- Solve problems imaginatively
- Think of the halo effect, you might bend down to talk to a child, so that they can be at your eye level. You might ask them the name of the toy they're holding. The child will enjoy this experience and other people will be impressed by what you are doing.

Exploring expectations of different types of customers in the travel and tourism sector

Meeting Expectations

- Your customer has been convinced to buy your product or service.
- You have given them expectations of what that product or service will provide.
- They will also have expectations based on previous customer service experiences and what their culture and ethnicity expects.
- Customers expect the information you provide them to be timely and accurate
- They expect their journey to be punctual
- They expect their room to be clean
- They expect their family to be looked after (if applicable)