Year 10 Cycle 2 Knowledge Organisers

Contents

SUBHEADINGS

1. Look at the subheading.
2. Write down everything you know about that topic without looking at the KO.
3. Check what you've missed; add this to your notes in a different colour.
4. Do something else (e.g. revise something else).
5. Return to this and repeat from the beginning.

BIG IDEAS

1. Look at the list of ideas the writer is trying to convey.
2. For each idea, write down HOW the writer does this.

MINDMAP

1. Create a mindmap of what you know about the topic areas on the page *from memory*.
2. Check your mindmap against the KO.
3. Add 5 things that you've missed using a different colour pen.
4. Do something else (e.g. revise something else).
5. Repeat.

'Remains' – Knowledge Organiser

What happens in the poem? The speaker and two other soldiers are sent to tackle some looters who are robbing a bank. They open fire on a looter who is running away. The looter is seriously wounded He is carried away in the back of a lorry. The soldier has to walk past the blood stain left on the ground week after week. He returns home and is haunted by the memory of what he has done, reliving it again and again. He drinks and takes drugs in an attempt to forget what happened. However, he is unable to forget the looter and what he did. The memory remains stuck in his mind.

What is the context of the poem?
- Simon Armitage wrote 'Remains' (and other poems) for a Channel 4 programme called 'The Not Dead'.
- He has never been to war himself and has never been a soldier.
- To write the poems, he interviewed a number of soldiers who have survived war (in Iraq, Afghanistan, the Falklands etc.) i.e. the 'not dead'.
- The poems show the suffering soldiers experience long after wars have finished.
- 'Remains' is heavily based on the experience of Guardsman Tromans who fought in the Iraq war.
- Tromans shot a looter in Iraq and suffers from PTSD.

What is the significance of the title? The poem is about PTSD – in other words, how the traumatic experience of war REMAINS with the soldier. It could also refer to the human REMAINS – the image of the looter – that the soldier obsesses over so much as part of his PTSD.
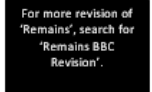
What is a central idea in this poem? As is implied by the title, the poem explores the trauma experienced by soldiers and the terrible impact of PTSD on survivors long after the battle has ended.

What other ideas are explored in the poem?
- War can cause suffering beyond the battlefield.
- War is damaging.
- Guilt is powerful and can overwhelm us.
- War can result in us dehumanising the enemy.
- War can cause us to act in ways we later regret.
- Memory can have a powerful effect on us.

Key Vocabulary	Definition	Example
Traumatic	Causing severe and lasting emotional shock or pain.	Being involved in war is deeply disturbing and a highly _____ experience.
PTSD (post-traumatic stress disorder)	This is an anxiety **disorder** caused by very stressful, frightening or distressing events. Someone with this often relives the **traumatic** event through nightmares and flashbacks, and may experience feelings of isolation, irritability and guilt.	The soldier in 'Remains' is suffering from _____.
Guilt	A feeling of worry or unhappiness that you have because you have done something wrong.	The soldier struggles to come to terms with the _____ he feels over shooting the looter.
Haunt	To revisit again and again.	The memory of the shooting _____ the soldier.
Dehumanisation	To treat people as less than human.	It can be argued that the soldiers in 'Remains' _____ the looter by treating him with so little respect.
Dramatic monologue	A poem made up of a single *character* speaking (i.e. the poet is very clearly writing as someone else).	'Remains' is a _____ because Armitage is writing as someone else and there is only one speaker in the poem.

Writer's Craft:	Example
Why is the poem written as a dramatic monologue?	To explore a traumatised soldier's thoughts and feelings; because the poem was produced following an interview with a soldier.
Why does Armitage use colloquial language?	To create a convincing voice – an ordinary person/soldier; to contribute to the almost matter-of-fact tone in the first half of the poem.
What does the first/second half focus on? What is the turning point?	First half: the shooting; second half: the emotional impact on the soldier. Turning point = 'End of story, except not really.'
Why is the shooting described with graphic imagery?	To convey the brutality; to show what has traumatised the soldier; because it's so vivid in the soldier's mind.
Why is the blood on the street described as a 'blood shadow'?	Shadow = dark imagery – connotations of death and misery; the shooting has cast a shadow over his life; a shadow follows you around
What does the imagery 'dug in behind enemy lines' suggest?	To the looter, the soldier is the enemy; the soldier's mind is enemy territory. The looter is in the soldier's mind, so this is 'behind enemy lines'. 'Dug in' means well defended and prepared for attack – this suggests that the memory of the looter is difficult to remove; 'dug in' is a military term, suggesting that the war/conflict is still going on for the soldier.
What impression does the final stanza leave us with and what is meant by 'bloody hands'?	It leaves us with the impression that the pain will be ongoing – there seems little hope of an end as the looter is still 'here and now'. 'Bloody' can suggest frustration (swearing), but 'to have blood on your hands' also means to be responsible for an act of violence against someone i.e. to be guilty of something.

For more revision of 'Remains', search for 'Remains BBC Revision'.

VOCABULARY

1. Cover the vocabulary and definition columns. Try to work out what the missing word is in the example. Check. Move to the next word. Repeat until you can do this with all the words you've studied so far.
2. Try the same as above, but this time by looking at just the definition column.
3. Try the same as above, but this time just look at the vocabulary and try to explain what the definition is.
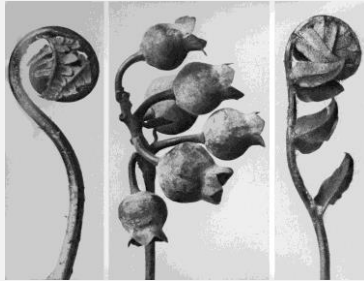
Questions

1. Cover the explanation.
2. Look at and write answers to the questions.
3. Check your answers; add anything you missed; correct anything you got wrong.
4. Do something else (e.g. revise something else).
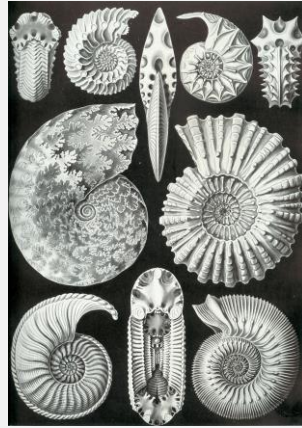5. Return to this and repeat from the beginning.

PICTURES

1. Look at just the pictures.
2. Explain how each of these pictures is relevant to the knowledge on the page.

Yr10 ART Natural & Man Made Forms - Knowledge Organiser C1 & C2

Artists References:

Georgia O'Keeffe

Karl Blossfeldt

Ernst Haeckel

Peter Randall Page

Eduardo Paolozzi

A01: Develop Ideas - Knowledge & Inspiration:

Peter Randall Page (Born 1954) Is a Contemporary British Sculptor based in Devon. He is inspired by the natural environment and use drawing and stone carving to make his art.

Georgia O'Keeffe (1887 – 1986) was an American artist who painted nature in a way that showed how it made her feel. She is best known for her paintings of flowers and landscape

Ernst Haeckel (1834 - 1919) was a German-born biologist, evolutionist and artist –who spent his life researching and illustrating flora and fauna.

Karl Blossfeldt (1865 -1932) is famous for his close-up photographs of plants.

Eduardo Paolozzi (1924-2005) was a British fine artist, printmaker and sculptor. He was inspired by everyday objects and was a major part of the Pop Art Era in the !960's.

A02: Exploring & Experimenting
Painting Techniques:
Acrylic on canvas and Watercolour.
Colour mixing, Blending,
Broken colour, Scumbling, Stippling
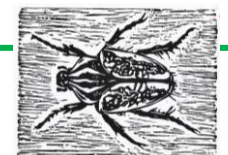
Printmaking Techniques:
Keywords: Ink, Perspex, Roller, Even Coverage, Blot, Reversed Image, Single or Repeated image
Mono-printing is a one off, unique print that combines printmaking & drawing techniques.
Lino printing is a form of printmaking where the lino printing plate is carved into using lino cutting tools, then inked up to print from.

A03: Drawing & Recording Skills:
Primary sources = drawing from something real in front of you.
Secondary sources = drawing something from a picture

Mark Making is used to describe the different lines, patterns, and textures we create in art. **Keywords:** Hatching, Cross hatching, Stippling
Expressive Drawing: Using marks to create expression, mood or atmosphere.

Tone: Shading & tone can be used to create the illusion of 3D form and space.
Drawing mediums:
Pencil, Biro, Fine Liner, Ink, Dipper Pens, Chalk & Charcoal & Oil pastel.
Each drawing media will give you a different effect. For example, charcoal
Is good for soft expressive marks , whereas pen will create crisp thin lines.

A04: Creative Brief – A Personal and Meaningful Response.
Create a painting inspired by close-ups or fragments of natural or man made forms. Make visual connections to an artist you have studied.

Cycle 1 and 2 Drawing, Painting & Printmaking –
 Key Words and Definitions.

- **Mark Making** is used to describe the different lines, patterns, and textures we create in art. **Keywords:** Hatching, Cross hatching, Stippling .
- **Elements of art =** the ingredients that are used to create art including: line, shape, colour, tone, pattern, texture, form
- **Composition** = the arrangement of the formal elements in an artwork.
- **Mono-printing** is a one off, unique print that combines printmaking & drawing techniques.
- **Lino Cut Printmaking –** Is a kind of relief or block print on a carved surface.
- **Positive & Negative Space : Positive space** refers to the subject or areas of interest in an artwork, such as a person's face or figure in a portrait, or the trees in a landscape painting. **Negative space** is the background or the area that surrounds the subject of the work.
- **Primary sources** = drawing from something real in front of you.
- **Secondary sources** = drawing something from a picture.
- **Tone:** Tone can be used to create the illusion of 3D form & space.

Colour Theory - Keywords

- **Intensity =** how bright or dull a colour is.
- **Primary** colours are colours that cannot be mixed: Red, Blue, Yellow.
- **Secondary** colours are created by mixing together 2 primary colours.
- **Tertiary** colours are created by mixing a primary & secondary colour.
- **Complementary** colours = colours opposite one another on the colour wheel
- **Harmonious** colours = colours next to each other on the colour wheel
- **Monochromatic =** tints & shades of 1 colour

3

Year 10 Cycle 2 Relative Size Project 1   Knowledge Organiser   Photography GCSE
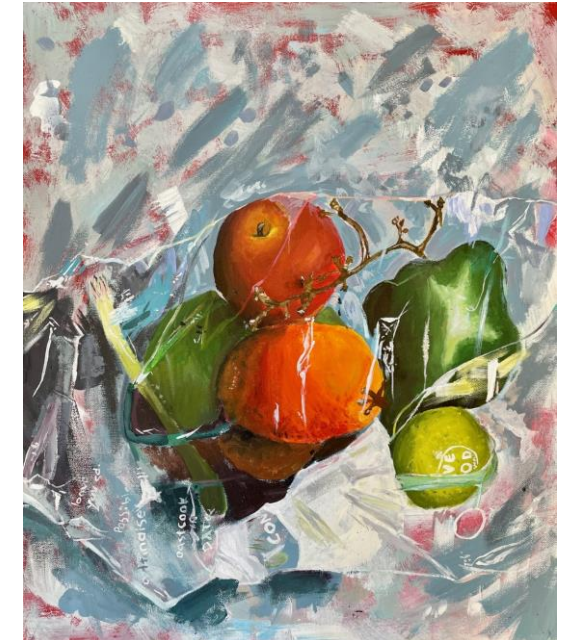
Key Words

Proportion- The proportion of one amount to another is the relationship between the two amounts in terms of how much there is of each thing.

Composition- the way we place all the elements of the photograph inside the four sides of the frame.

Perspective- in photography refers to the spatial relationship between subjects in the frame.

Forced perspective- is a technique that employs optical illusion to make an object appear farther away, closer, larger or smaller than it actually is.

Relative size- refers to clues in the picture that help you figure out the size of objects. Playing with relative size forces the viewer to imagine something much bigger or much smaller than seemingly possible.

Scale- is the ratio of the distance between two points on an image to the actual distance between the same two points on the ground.

Close up- refers to a tightly cropped shot that shows a subject (or object) up close and with significantly more detail than the human eye usually perceives.

Macro- Macro photography is all about showcasing a subject larger than it is in real life — an extreme close-up of something small.

Focus- is the sharpest area of the image.

Miniature characters- miniature figures. A collectable figurine, often an artistic, and sometimes a prehistoric or antique specimen.

Lego figures- miniature figures made from interlocking **blocks**

Instillation Art- is an artistic genre of three-dimensional works that are often site-specific and designed to transform the perception of a space.

Still life- a collection of inanimate objects arranged together in a specific way

Light box- a small studio that includes everything but the camera in a photography setup..Providing an evenly lit environment for photographing products

Photographers

Slinkachu- Henrick Sarimo was born in 1979. **Slinkachu** is a street artist that uses every day objects, and tiny figurine's, to create pictures.

Christopher Boffoli- is a fine art photographer, photojournalist, independent filmmaker, and journalist based in Seattle. He is best known for his "Big Appetites" photographs series, in which tiny, detailed human figures pose in real food environments

Issac Cordal-saac Cordal is a Spanish Galician artist whose work involves sculpture and photography in the urban environment.

Akiko Ida and Pierre Javelle-combine photography, magical landscapes, culinary backdrops, and portraiture to create settings inhabited by diminutive characters,

Vesa Lehtimaki-Vesa Lehtimäki is an illustrator and photographer based in Helsinki. He was inspired by his son's Lego Star Wars toys to begin photographing them.

Samsofy- (Sofiane Samlal) is a photographer from Lyon. He started out in extreme sports photography in urban areas, but in the months he spent at home following the birth of his son, his work became focused around the world of LEGO® minifigures.

Practical Skills

Research skills using the internet to gather information

Presentation skills using the guillotine to cut and stick research focusing on layout of page.

Photographic skills taking photo shoots with a focus on composition

Editing skills using photo shop or photo pea to edit photographs

Practical experimentation to use art techniques to create photographic art work

Project Outline

Title page- images and title

Mind map of ideas- image and key words

Critical studies – research, images and Analysis (Content, context, composition, Mood, inspiration) planned photo shoot with ideas explained and thumbnails. Photo shoot , contact sheet and evaluation. Re-shoot to develop ideas. Edits of photographs

Theme photo shoots- planning for shoots explaining idea and focus. Photo shoot. Contact sheet and evaluation. Re shoot To develop ideas. Edits of photographs

Experimentation of photographs and ideas

Development of ideas leading to a final piece

Business Aims and Objectives	
Non-Financial Aims	Personal Challenge Personal Satisfaction Independence and Control Social Objectives
Financial Aims	Survival Profit Sales Market Share Financial Security
Factors affecting the aims of a business	The size of a business
	Level of competition
	Type of business

Cash and Cash Flow	
The Importance of Cash to a Business	To pay suppliers, overheads and employees
	To prevent business failure (insolvency)
	The difference between cash and profit
Calculating and interpretation of Cash-flow forecasts	Cash Inflows
	Cash Outflows
	Net Cash Flow
	Opening and Closing balances

Business Revenue, Cost and Profit	
Concepts and Calculations	Revenue Fixed and Variable Costs Total Costs Profit and Loss Interest Break-Even Level of Output Margin of Safety
Interpretation of Break-Even Diagrams	Impact of changes in Revenue and Costs Break even level of output Margin of safety Profit and loss

Sources of Business Finance	
Short Term Sources	Overdraft
	Trade Credit
Long Term Sources	Personal Savings
	Venture Capital
	Share Capital
	Loans
	Retained Profit
	Crowd Funding

The options for start-up and small businesses	
The concept of limited liability	Limited and unlimited liability The implications for the business owners of limited and unlimited liability
The types of business ownership for start-ups	Sole trader Partnership Private limited Company
The option of starting up and running a franchise	Advantages and disadvantages of franchising

The Marketing Mix	
What the Marketing Mix is and the Importance of each element	Price Product Promotion Place
How the elements of the marketing mix work together	Balancing the marketing mix based on the competitive environment
	The impact of changing consumer needs on the marketing mix
	The impact of technology on the marketing mix E-commerce, digital communication

Business Location	
Factors influencing business location	Proximity to : Market, Labour, Materials and Competitors Nature of business activity The impact of the Internet on location decisions: E-commerce and / or fixed premises

Business Plans	
The Role and Importance of a Business Plan	To identify: the business idea, business aims and objectives, target market (market research), forecast revenue, cost and profit, cash-flow forecast, sources of finance, location, marketing mix
The purpose of planning business activity	The role and importance of a business plan in minimising risk and obtaining finance

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!")	OUTPUT "Hello World"
Hello World!	
print("Hello", "World!")	
Hello World!	
print("Hello"+"World!")	
HelloWorld!	
print("Hello\nWorld!")	
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 – Whole number	age = 12	age ← 12
Float (real) number – A number with a decimal point	height = 1.52	height ← 12
Character – A single letter, symbol or number	a = 'a'	a ← 'a'
String – multiple characters	name = "Bart"	name ← "Bart"
Boolean – Has two values: true of 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.

Finishes, Standard Components,

Accuracy and Process Orders

Finishes

Finishes are used to improve the **aesthetics** and **durability** of products

Material Type	Finishes Used	
Papers and Boards	• Paints • Varnishes • Laminating	• Plastic coating • Wax coating
Timbers and Boards	• Paints • Varnishes • Wax and Polish	• Staining • Oil
Metals and Alloys	• Painting • Lacquering • Electroplating • Galvanzing	• Polishing • Plastic Coating • Powder Coating
Plastics	• Polishing • Painting • Decals (stickers)	

Standard Components

Standard components are parts or components manufactured in the 1000s+
They are readily available, don't require specialist knowledge or tools to replace them and are universally recognised

Material Type	Components used	
Papers and Boards	• Staples • Clips • Split pins	
Timbers and Boards	• Nails • Screws	• Panel Pins • Hinges
Metals and Alloys	• Nuts and bolts • Screw	• Rivet • Washer
Plastics	• Plastic hinges	

Tolerances

- The total amount a specific dimension or property is permitted to vary
This can apply to hole depth, length, angle, thickness, weight and elasticity
A gauge can be inserted into a gap or hole to check if the sizes fall within tolerance
If parts do not fit within the specified tolerances they are discarded or recycled

Quality Control and Quality Assurance

- QC is **_product_** oriented
Quality control is where products are regularly tested (during and after manufacture) to ensure they meet the defined set of quality criteria

- QA is **_process_** oriented
Quality assurance is ensuring that the processes used to test the product have been done correctly and consistently
You can test a product all you like, but if the tests are wrong/ inconsistent with each other than the results are invalid

- Below are examples of Quality Assurance symbols:

European Conformity   BSI Kitemark   Lion Mark   Registration Mark

Process Orders

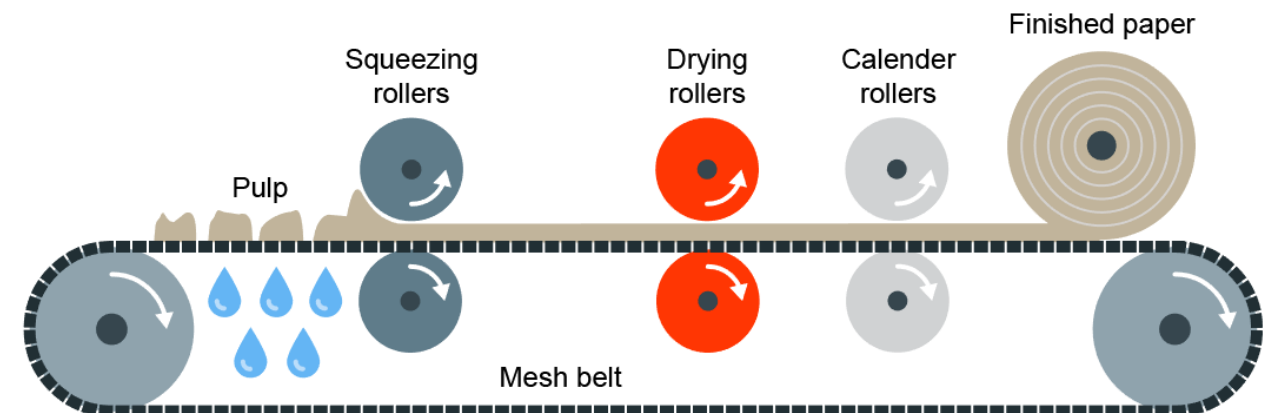| An Input is information/ stimuli that enters a PC An example would be keyboard, sensor, mouse, etc	→	A Process is process of transforming information into an Output An example would be a PC	→	An Output is a response to the stimuli An example would be speakers, text on a screen, alarm, lights, etc
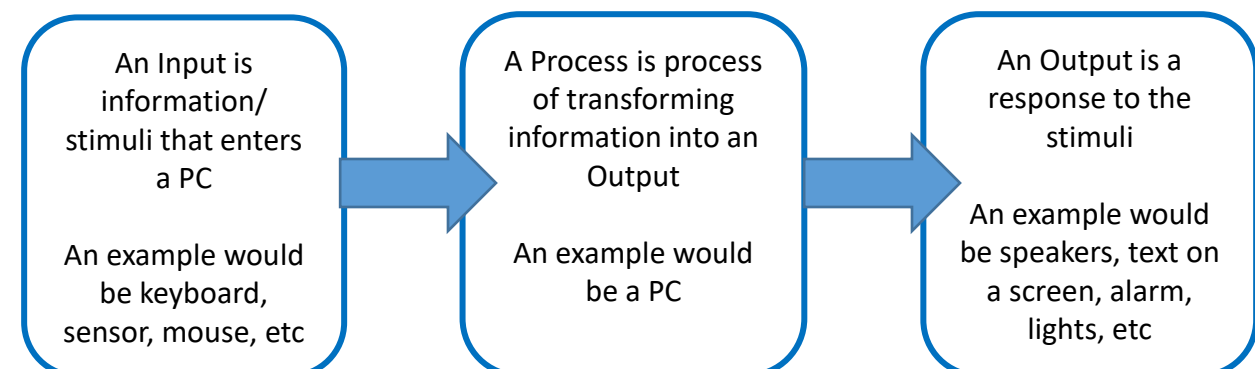
Modern Materials are materials that have been developed recently		
Material	**Key info**	**Examples**
Corn-starch Polymers	These are plant-based polymers that are a replacement for plastics that are **biodegradable** but cannot be recycled.	Plastic bottles, tubs, food containers, etc
Flexible MDF	Made in the same way as normal MDF but with grooves cut into the surface so it is flexible. **Flexiply** is the same but for Plywood. These can easily be shaped into curves	Modern furniture, interior walls and room dividers
Titanium	High strength to weight ratio. Doesn't corrode or rust. Suitable for medical use as its hypo-allergneic	Prosthetics, medical applications, sports cars, etc
Kevlar	A woven polymer with a high strength to weight ratio.	Bullet-proof vests, tyres, helmets, etc

Papers and Boards come from trees. The Stock forms for papers are: rolls, sheets, A4, A3, etc		
Material	**Key info**	**Uses/ Examples**
Cartridge Paper	Thick white paper, completely opaque and more expensive than photocopy paper	Sketching, ink drawings
Layout Paper	Light, semi-translucent, good for blending inks and artist markers	Sketching, drawing and some tracing
Corrugated Cardboard	Strong but light. Rigid triangles of card sandwiched between a top and bottom layer.	Outer packaging, food packaging
Duplex Board	Light card with white outside layers. Waxy coating can be added	Cheap packaging. If waxy coating is applied, can be used for food
Foil-lined Board	White card coated with a thin aluminium layer. Foil is great for insulation and water resistance	Takeaway containers
Solid White Board	High-quality white card with a smooth finish. Stiff and holds colours well	Greetings cards, packaging and advertising

Smart Materials are materials that change and react to the stimuli		
Material	**Key info**	**Examples**
Thermochromic Pigments	Change colour in reaction to heat	Kettles, baby bottles, etc
Photochromic Pigments	Change colour in reaction to light	Colour changing glasses, windows, etc
Shape Memory Alloy	Returns to its original shape, in reaction to heat	Braces and glasses
Polymorph	Granules that once exposed to hot water, become a modelling material (like a dough or clay)	Modelling and repairs

Primary Processing of Papers and Boards

Paper is made by first making pulp. Pulp is a mix of tree fibres and water. This is cooked and bleached white, and adding any other additives.
The pulp is then drained and goes through **Calendering** where the pulp is drained and goes through rollers to convert it to its stock forms

11

Natural Timbers

Softwoods are generally cheaper than hardwoods as they are more available, since they grow quicker.
But because man-made boards are manufactured they are cheaper than timbers.
Man-made boards also come in a better variety of sizes since they don't depend on tree growth.

Stock forms for both include; sheets, dowel, planks, etc

Hardwoods come from **Deciduous Trees.** These trees loose leaves in winter and grow fruit and flowers in spring		
Material	**Key info**	**Examples**
Ash	Flexible, tough and shock resistant	Sports equipment Tool Handles
Beech	Fine finish, tough and durable	Toys, furniture and veneers
Mahogany	Easily worked, durable, high quality finish	High-end furniture
Balsa	Very soft and spongy. Light	Modelling
Oak	Tough, durable and hard	Flooring, furniture and veneers

Softwoods come from **Coniferous Trees.** These have thin, needle-like leaves and grow all year round. Often have pine cones and sometimes nuts and seeds		
Material	**Key info**	**Examples**
Larch	Durable, tough, good water resistance and finishes well	Furniture, flooring and used outdoors
Pine	Light, easy to work with but can split	Cheap furniture, construction and decking
Spruce	Easy to work with, high stiffness but can decay quickly	Furniture, musical instruments and construction

Man-Made Boards

Manufactured boards are made from wood chips/dust/ layers and glue.		
Material	**Key info**	**Examples**
Chipboard	Prone to chipping but good compressive strength. Not-water resistant	Flooring, low-end furniture, flat-pack
MDF	Rigid and stable. Easy to finish. Absorbs liquid easily	Flat-pack furniture and kitchen unites
Plywood	Very stable. Exterior veneer can be used from more expensive woods	Shelving, furniture, toys

Primary Processing of Papers and Boards

Trees are cut then converted into planks by cut using saws
It is then seasoned to reduce the moisture in the wood. This is done by either:

Air-drying – Planks are stacked and air allowed to circulate; causing evaporation
Kiln-drying – Where planks are put into a kiln and dried rapidly. This process is more costly than air-drying
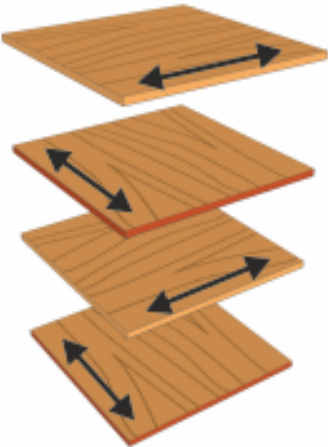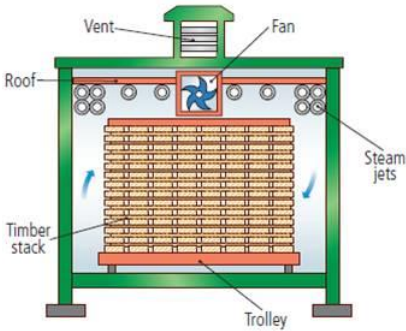
Manufactured boards can be either be made by lamination or compression

Lamination – Layers of woods and adhesive are layered and compressed together. Usually with a more expensive wooden veneer on the top

Compression – Wood is shredded, heated and compressed with adhesive under extreme pressure

12

Metals

Metals come from ores in the ground. **Stock forms** are sheets, bars and rods

Ferrous Metals contain iron and are magnetic and rust		
Material	**Key info**	**Examples**
Low Carbon Steel	Tough and ductile and easily machined and welded	Construction, screws, cars
High Carbon Steel	Hard and wears well	Tools, blades and knives
Cast Iron	Hard but brittle. Easily cast but hard to machine	Pots, pans, vices

Non-Ferrous Metals do not contain iron, aren't magnetic and don't rust		
Material	**Key info**	**Examples**
Aluminium	Light, high strength to weight ratio and ductile	Pots, pans, cars, cans
Copper	Ductile, malleable and good conductor	Plumbing supplies and cables
Tin	Soft, malleable and good conductor	Used as a protective coating

Alloys

Alloys are mixtures of 2 or more metals to get the best of their properties		
Material	**Key info**	**Examples**
Brass	Malleable and easy to cast	Musical instruments, plumbing
Stainless Steel	Doesn't rust, hard and smooth	Cutlery, medical tools, etc

Plastics

Plastics come from crude oil. **Stock forms** are sheets, powders, granules and rods

Thermoplastics can be reheated and reshaped and infinite amount of times		
Material	**Key info**	**Examples**
PET	Easily **blow moulded,** food safe and easily recycled	Bottles, packaging, etc
PVC	Flexible, tough, easily **extruded**	Pipes, tape, hard hats
HIPS	Flexible, lightweight, food safe and easily **vacuum formed**	Containers and yoghurt pots
Acrylic	Tough, brittle, easily scratched	Car lights, baths, displays/ signs

Thermosets once heated and set cannot be reshaped		
Material	**Key info**	**Examples**
Melamine Formaldehyde	Food safe, hygienic, hard and brittle	Kitchenware and work surfaces
Urea Formalehyde	Good insulator, hard and brittle	Electrical casings, buttons and handles
Polyester Resin	Strong, heat resistant, can be transparent	Coatings, casings

Primary Processing of Metals and Alloys

Metals are mined from the earth and then go through an extraction process
Extraction happens by putting the ore in a blast furnace
The metal is then separated from the waste material

Primary Processing of Plastics

Crude oil is extracted from the earth and then processes into different types of fuels, etc. This is called **Fractional Distillation**

A process called **Cracking** then converts the large hydrocarbon molecules into plastics

Market Pull and Technology Push

Technology Push is the development of new technology, materials and manufacturing methods to create new products or improve old ones.

Examples include; Smart Phones, Electricity, Mass Production, etc

Market pull is the demand from consumers for new products and improvements in old ones; this is often found via reviews, polls, surveys, etc

Examples include; Product **Aesthetics,** making products easier to use, etc

Cultures, Faith and Belief

Different groups of people have different interests and have to be catered for.

Different countries and cultures also react to products differently.

E.g. In India McDonalds don't sell beef burgers as it has a large Hindu population, and cows are seen as sacred – in contrast the UK sells its most amount of fish and chips on a Friday as it is a Christian tradition to not eat meat on that day.

Case Study: £5 note

Hindu, Sikh and some other faith-based communities may choose to follow a vegetarian diet, and this is part of their culture. In addition to not eating meat, many followers of these faiths, as well as vegans and vegetarians, take every opportunity to avoid using animal products in their day-to-day lives.

The revelation in 2016 that the new polymer Bank of England £5 note contained tallow, an animal fat-based substance, upset a number of communities. There was a prompt call for the Bank of England to find an alternative way to produce the note and in the first two days of an official petition well over 100,000 signatures were received.

Shortly after the Bank of England admitted that the new polymer £5 note contained the animal by-product, some establishments refused to take the notes as a method of payment. One café owner was repulsed by the idea that the note contained tallow and believed that her customers supported her view. They received no complaints.

The Bank of England say they currently have no plans to change the manufacturing process.

Fashion and Trends

Fashion and Trends will change quickly, and you can see major differences in fashions over decades.

Designers have to make sure their products meet the fashion and trends of the area they are designing and selling the product to.

The change of products over time is called **Product Evolution**. This is caused by Market Pull, Technology Push and Fashion and Trends.

Some products are seen as **timeless.** These products are called **Iconic Designs.** These products are timeless because they were innovative, set a bench mark for following products, changed their industry and are often copied.
Examples include; iPod, iPhone, Angle-Poise Lamp, Swiss Army Knife, Converse Shoes, Levi's Jeans, Classic Mini Cooper

Inclusive vs. Exclusive Design

Inclusive Design: The aim to create a product that as many people as possible can use

Examples include; Cars, Doorframes, Adjustable Products, etc

Exclusive Design: The aim to create a product for a particular group and their needs

Examples include; Car seats for babies, Wheelchairs, Stair Lifts

14

Front of house roles and responsibilities	
Front of house manager	Making sure they train the front of house staff and ensure that they are fulfilling their duties
Head waiter	Overseas the waiting staff. Will prepare staff rotas. They manage the food service section
Waiting staff	They will take orders, serve food, clear away, take payments and prepare tables.
Concierge	Assist hotel guests , for example book taxis, tickets for attractions and making reservations
Receptionist	They meet customers and help them check into rooms. They sometimes manage the booking systems
Valets	Meet and greets guests as they arrive. Often park vehicles for customers

House Keeping roles and responsibilities	
Chambermaid	Clean and prepare rooms for guests. This will include changing bedding and towels
Cleaner	Carries out cleaning tasks around the hotel for example vacuuming, mopping and tidying up sills
Maintenance staff	Complete any repairs in house. If they can't fix it they will call in engineers for example gas/electric engineers
Caretaker	Maintains the building and the grounds. Will work alongside contractors/engineers

Kitchen brigade roles and responsibilities	
Executive chef	The head chef, in charge of the kitchen. Involved in menu planning, stock, staff rotas and training.
Sous-chef	In charge of food production, often in charge of the day to day running of the kitchen
Chef de partie	Responsibility for a particular section of the kitchen. For example fish chefs, roast chefs, sauce chefs etc
Commis chef	Carries out stock and collecting ingredients. Might be part of an apprenticeship or studying at college
Pastry chef	Makes bread, pastries, cakes, desserts and other baked goods.
Kitchen assistant	Supports the chef de parties. Washing up, basic prep etc
Apprentice	Works alongside a member of the kitchen brigade, train them on the job
Kitchen porter	Washes up and may do basic veg prep

Personal attributes: Flexible, Calm, Friendly, Team player, Organised

Qualifications and experience	
KS4 school courses	• Level 1/2 Hospitality and catering • GCSE Food and Nutrition
Post 16-19	• Diplomas • Certificates • A levels
Universities	• Degrees • HND/HNC

1.1.2 Working in the hospitality and catering industry

Hours of work are specified. Sick and holiday pay are given

Work when needed but no specific hours. No sick or holiday pay

Zero hours

Full time; permanent

Casual work

Seasonal work or to cover for sickness. No sick or holiday pay

Part time; permanent

Hours of work are specified. Sick and holiday pay are given, though reduced

Factors that affect rates of employment
- Availability of skilled staff
- Time of the year
- Weather
- Special events
- Weekends

SAT

SUN

Remuneration and benefits	
Salary	A fixed amount of pay regardless of hours worked
Wage (hourly)	A payment for each hour worked
Holiday pay	Paid employees are entitled to holiday pay each year
Pension	A fund employees and employers pay into to prepare for retirement
Sickness pay	Paid to employees when they are ill
Rates of pay	How much the pay is per hour
Tips, bonuses and rewards	Tips: paid by customers. Bonuses: extra pay linked t performance. Rewards: similar to a bonus.

1.1.3 Working conditions in the hospitality and catering industry

BERTOLT BRECHT

WHO – **Bertolt Brecht** was born in **Germany** in **1898** and died at the age of **58** in **1956**. He was a **playwright, a director, an actor** and developed many **original ideas and theories about theatre** and acting which means he is considered to be a **theatre practitioner**. His plays are still performed around the world and his theories are still used in performances of other plays.x

WHERE AND WHEN - After serving as a medical orderly in the First World War and appalled by the effects of the war, he went first to Munich and then to Berlin in pursuit of a career in the theatre. That period of his life came to an end in 1933 when the Nazis came to power in Germany. Brecht fled and during this period the Nazis removed his citizenship, so he was a stateless citizen. In 1941 Brecht lived in the USA but returned to Europe in 1947 after being accused of being anti-American. By the time of his death in 1956, Brecht had established the **Berliner Ensemble – Theatre Company** and was regarded as one of the greatest theatrical practitioners.

WHAT - Brecht made many changes to the theatre of his day. He disagreed with the fact that an audience should be swept along with the emotion of a production. **Before Brecht, the theatre of the day would use realistic story lines and high emotion, it would expect the audience to believe in the characters and the situations.**
Brecht felt that the theatre should be something that made the audience feel more than simple emotion –he wanted it to make the audience **think** or **learn** something and to **make a change for the better** as a result. Brecht disliked the way that the theatre tricked the audience in to thinking that what they were watching on stage was real life. He decided to try to remind the audiences that they were sitting in a theatre just watching a story being told. Brecht trained his actors to remember that they were not 'becoming' the characters but simply **presenting the character** to the audience.

WHAT IS EPIC THEATRE?

Brecht called his own style of theatre **'epic'** contrasting it with popular **'dramatic'** theatre. You can sum up his style in **three** words: **Didactic, Alienation & Gestus.**

Didactic - Brecht wanted his audience to **'THINK'**. He wanted his theatre to show audiences that they should take the position of spectators and learn lessons from it. His plays are **didactic (educational)** because they aim to **teach the audience or send messages about certain aspects of society, politics or economy.**

Alienation - Brecht believed that while the audience believed in the action onstage and became emotionally involved they lost the ability to think and to judge. **He wanted his audiences to remain objective and distant from emotional involvement** so that they could make considered and rational judgements about any social comment or issues in his work.

To do this he used a range of theatrical devices or techniques so that the audience were **reminded throughout that they were watching theatre; a presentation of life**, not real life itself. He called this **Epic Theatre**. The act of distancing the audience from emotional involvement he called the **Verfremdungseffekt.**

Gestus – This is a clear character **gesture or movement** used by the actor that captures a moment or attitude rather than delving into emotion. **Every gesture was important**. Brecht and his actors studied photographs of the plays in rehearsal to ensure each moment worked effectively. Could the audience tell by the actor's gestures alone what was happening in the scene?
Brecht didn't want the actors to be the character onstage, only to **show them as a type of person**. For example, the boss who is corrupt and smoking a fat cigar as his workers starve is representative of every boss who profits through the exploitation of others. For this reason Brecht will often refer to his characters by **archetypal names**, such as 'The Soldier' or 'The Girl'.

DRAMATIC CONVENTIONS

Brecht's **'Verfremdsdungseffekt'** is often translated to the **Alienation or Distancing Effect**. This means that the performers make familiar things strange to the audience, which in turn makes them an **active audience** who have to think about what they are watching.

Examples of Alienation Techniques
Breaking the Fourth Wall – This involves the characters directly addressing and acknowledging the audience.
Songs – These were used to remind the audience that they are watching a performance (it is not normal for people to burst into song). The lyrics and music would jar (not fit together in style) further distancing the audience.
Spass – This translates as fun. Brecht knew the power of making the audience laugh and then making them question why they are finding serious things funny. This is sometimes called Tickle and Slap.
Design – The audience were reminded that they were in a theatre watching a performance as the house lights were left on, all of the set was visible from the start and the actors did all of the set changes. Costumes were symbolic and also changed on stage. The actors often played the instruments used for the songs on stage too.
Placards – Signs were held up to tell the audience the title of the scene and what was going to happen in them, this was to take away suspense and emotion and allow the audience to think about the scene instead.
Narration – This reminds the audience that they are watching a presentation of a story. Sometimes the narrator would tell the audience what happens in the story before it happens.
Direct address –The actors speak directly to the audience, sometimes in the form of questions, this reminds the audience that what they are seeing isn't real and forces them to think about what they are watching.
Multi Roling & Split Role –The actors play more than one part in the performance, changing characters in front of the audience's eyes or in the case of Split Role take it in turns to play the same character.
Speaking the Stage-Directions – More frequently used in rehearsals but can be effective in performance to create the V Effect. It helps distance the actor from the character they are playing.
Episodic – He wrote his plays so each scene stands alone.
Montage – He re-ordered the scenes in his plays from a traditional linear narrative. He liked to place scenes next to each other in contrasting styles, length and content so the audience had to stay alert.

17

English: 'Bayonet Charge' – Knowledge Organiser

What happens in the poem? The poem starts mid-action with a soldier charging towards the enemy with a bayonet attached to his rifle - it is exhausting, disorienting and overwhelming. In the heat of battle, the soldier realises he is no longer motivated by patriotism. The soldier is suddenly confused: if he's not there for patriotism, why is he fighting? He reflects on how he is there because of the decisions of others: he's a cog in a machine. He briefly pauses in his charge as he realises this. However, the soldier is shaken from his reflection by the danger to him: his instincts take over and charges towards the enemy because the only thing he cares about now is surviving (by killing).

What is the context of the poem?
- Ted Hughes was inspired to write the poem by World War 1 (his father fought in it and Hughes admired the poetry of WW1 poets such as Wilfred Owen.
- There were strong feelings of patriotism at the start of WW1: men queued up to fight. Many expected the war to be over in just a few months.
- However, the war lasted from 1914-18 and conditions were horrific.
- Nearly a million British personnel died in the war.

What is the significance of the title? The poem describes the experience of being in a bayonet charge (and considers the thoughts and feelings a soldier might have).

What are the central ideas in this poem?
- The battlefield is a chaotic and overwhelming place.
- People might choose to fight because of patriotism or a sense of duty; however these are soon forgotten on the battlefield.
- On the battlefield, it is survival instinct that truly motivates people to fight.
- Soldiers on the battlefield are just pawns in the games of kings and governments.
- Even thoughtful, reflective individuals can become mindless killing machines when the survival instinct takes over.

Key Vocabulary	Definition	Example
Patriotic	Describing someone who loves or is proud of their country.	Many people _____ at the start of WW1: they were proud to fight for their country.
Overwhelmed	The feeling that there is much more than you can deal with.	If you let work pile up, it is easy to feel _____ because it becomes difficult to see how you will manage it all.
Disorientated	Confused about where you are or where you are going.	When walking through a maze, it is easy to become _____.
Bewilderment	Confusion.	If are confused about why we are doing something, we might experience _____.
Terror	Extreme fear.	If I saw a real ghost, I wouldn't just experience fear, I'd experience _____.
Survival instinct	The instinct in humans and animals to do things in a dangerous situation that will prevent them from dying.	It's amazing what we can do when we're threatened – once the _____ kicks in, we become more like animals.
Imagery	The use of words or phrases to create mental images.	In 'Bayonet Charge', the phrase 'his terror's touchy dynamite' is a very effective use of _____.

Key Quotes: 'cold clockwork of the stars and the nations.'   'dropped like luxuries'   'his terror's touchy dynamite'

Writer's Craft:	Explanation
How does the poet convey the chaos of battle In the first stanza?	By using a list of sensory detail (e.g. the dazzling guns, the loud noises, the exhaustion) as a single sentence. The poem also starts in the middle of the action which adds to the sense of chaos.
Why describe the sweat as 'like molten iron'?	Molten iron is incredibly hot; it suggests that his chest is burning (perhaps his lungs from the effort of charging); this sweat is what was once his 'patriotic tear'.
What is meant by 'the cold clockwork of the stars and the nations'?	Hughes presents the soldier as the second hand of a clock; a second hand has to move if the cog it is attached to moves: one cog turns another etc. The soldier is powerless: he's ended up where he is because of governments making decisions (turning cogs) which have led to him being where he is.
What is meant by 'king, honour, human dignity dropped like luxuries'?	Luxuries are things that are pleasant to have but not necessary; when you are fighting to survive luxuries are worthless; 'honour' and patriotism ('king') are 'dropped' on the battlefield because they are luxuries: only fighting and surviving matters.
What is meant by 'his terror's touchy dynamite'?	The soldier's survival instincts. Dynamite can explode, but it needs a spark; the soldier's survival instincts need the spark of danger to 'light the fuse'; terror is this spark and the suggestion is that he will 'explode' when he reaches the enemy.
How does Hughes use sentence length to present the soldier as feeling overwhelmed?	The first sentence doesn't end until part way through the second stanza. This means that the reader is given little pause and might struggle to take in everything that is happening: this mirrors the soldier's experience on the battlefield.
How does Hughes structure the poem to present the soldier's changing thoughts and feelings?	The poem starts in the middle of the action and the first stanza focuses on how overwhelming and chaotic it feels to be on a battlefield. The second stanza shows the soldier questioning why he is fighting and wondering if he is just a powerless cog in a machine. The third stanza shows the soldier's survival instincts kick in (causing him to abandon his deep thoughts).

For more revision of this poem', search for 'Bayonet Charge poemanalysis.com'

English: 'Remains' – Knowledge Organiser

What happens in the poem? The speaker and two other soldiers are sent to tackle some looters who are robbing a bank. They open fire on a looter who is running away. The looter is seriously wounded He is carried away in the back of a lorry. The soldier has to walk past the blood stain left on the ground week after week. He returns home and is haunted by the memory of what he has done, reliving it again and again. He drinks and takes drugs in an attempt to forget what happened. However, he is unable to forget the looter and what he did. The memory remains stuck in his mind.

What is the context of the poem?

- Simon Armitage wrote 'Remains' (and other poems) for a Channel 4 programme called 'The Not Dead'.
- He has never been to war himself and has never been a soldier.
- To write the poems, he interviewed a number of soldiers who have survived war (in Iraq, Afghanistan, the Falklands etc.) i.e. the 'not dead'.
- The poems show the suffering soldiers experience long after wars have finished.
- 'Remains' is heavily based on the experience of Guardsman Tromans who fought in the Iraq war.
- Tromans shot a looter in Iraq and suffers from PTSD.

What is the significance of the title? The poem is about PTSD – in other words, how the traumatic experience of war REMAINS with the soldier. It could also refer to the human REMAINS – the image of the looter – that the soldier obsesses over so much as part of his PTSD.

What is a central idea in this poem? As is implied by the title, the poem explores the trauma experienced by soldiers and the terrible impact of PTSD on survivors long after the battle has ended.

What other ideas are explored in the poem?

- War can cause suffering beyond the battlefield.
- War is damaging.
- Guilt is powerful and can overwhelm us.
- War can result in us dehumanising the enemy.
- War can cause us to act in ways we later regret.
- Memory can have a powerful effect on us.

Key Vocabulary	Definition	Example
Traumatic	Causing severe and lasting emotional shock or pain.	Being involved in war is deeply disturbing and a highly _____ experience.
PTSD (post-traumatic stress disorder)	This is an anxiety **disorder** caused by very stressful, frightening or distressing events. Someone with this often relives the **traumatic** event through nightmares and flashbacks, and may experience feelings of isolation, irritability and guilt.	The soldier in 'Remains' is suffering from _____.
Guilt	A feeling of worry or unhappiness that you have because you have done something wrong.	The soldier struggles to come to terms with the _____ he feels over shooting the looter.
Haunt	To revisit again and again.	The memory of the shooting _____ the soldier.
Dehumanisation	To treat people as less than human.	It can be argued that the soldiers in 'Remains' _____ the looter by treating him with so little respect.
Dramatic monologue	A poem made up of a single *character* speaking (i.e. the poet is very clearly writing as someone else).	'Remains' is a _____ because Armitage is writing as someone else and there is only one speaker in the poem.

Writer's Craft:	Example
Why is the poem written as a dramatic monologue?	To explore a traumatised soldier's thoughts and feelings; because the poem was produced following an interview with a soldier.
Why does Armitage use colloquial language?	To create a convincing voice – an ordinary person/soldier; to contribute to the almost matter-of-fact tone in the first half of the poem.
What does the first/second half focus on? What is the turning point?	First half: the shooting; second half: the emotional impact on the soldier. Turning point = 'End of story, except not really.'
Why is the shooting described with graphic imagery?	To convey the brutality; to show what has traumatised the soldier; because it's so vivid in the soldier's mind.
Why is the blood on the street described as a 'blood shadow'?	Shadow = dark imagery – connotations of death and misery; the shooting has cast a shadow over his life; a shadow follows you around
What does the imagery 'dug in behind enemy lines' suggest?	To the looter, the soldier is the enemy; the soldier's mind is enemy territory. The looter is in the soldier's mind, so this is 'behind enemy lines'. 'Dug in' means well defended and prepared for attack – this suggests that the memory of the looter is difficult to remove; 'dug in' is a military term, suggesting that the war/conflict is still going on for the soldier.
What impression does the final stanza leave us with and what is meant by 'bloody hands'?	It leaves us with the impression that the pain will be ongoing – there seems little hope of an end as the looter is still 'here and now'. 'Bloody' can suggest frustration (swearing), but 'to have blood on your hands' also means to be responsible for an act of violence against someone i.e. to be guilty of something.

For more revision of 'Remains', search for 'Remains BBC Revision'.

What happens in the poem? It's the 16th century and we're in a Duke's palace. The Duke is showing an emissary around. The emissary works for a Count and has come to negotiate the marriage of the Count's daughter to the Duke. The Duke stops at a painting of his former – now dead – wife (his last Duchess). The Duke uses this as an opportunity to show his irritation that his wife seemed to be too happy around other men and hints that she may have been unfaithful. He seems to think she should have only smiled and blushed for him. The Duke says that he gave orders and that the smiles stopped – hinting that he had her killed. The Duke then calmly moves on to discussing his next marriage.

What is the context of the poem?

- The poem is based on real life people (and rumours about them).
- The Duke in the poem is Duke Alfonso II who ruled Ferrara in Northern Italy; the Duchess is his wife, Lucrezia de Medici.
- The Duke's wife died in mysterious circumstances – there were rumours at the time that the Duke had her poisoned.
- Browning wrote the poem in the Victorian period.
- Although it set in the 16th century, the poem is seen by some as a criticism of Victorian values e.g. attitudes to women.

What is the significance of the title? The title shows the Duke's desire to possess ('my'); it also hints at the Duke's almost obsessive focus in the poem on his last Duchess.

What are the central ideas in this poem?
- Some people feel a need to dominate others.
- Powerful people can be immoral.
- Power can cause people to see other human beings as objects.
- Women have historically been treated as objects.
- Paranoia and jealousy can lead people to cruel acts.

For more revision of this poem, search for 'My Last Duchess Lit Charts'.

Key Vocabulary	Definition	Example
Dominate	To control someone or something (often in a negative way) because you have more power or influence.	It is not healthy for one person to _____ a relationship.
Obsession	Something or someone that you think about all the time.	The toy was his _____. He couldn't think of anything else.
Possessive	Not wanting to share someone's love and attention with anyone else.	The Duke is very _____ of the Duchess; he doesn't want anyone else to share her affection.
Status	Social rank; position in the hierarchy.	Being important matters to some people; to them, _____ can be worth more than money.
Superiority	One person or thing better or more important than another.	Some people look down on others and act with a sense of _____.
Omnipotent	All powerful.	According to Christian belief, God is _____.
Stoop	To bend the top half of the body forwards and down.	If you are very tall, you might have to _____ in a house with low ceilings.
Countenance	The appearance or expression of someone's face.	His countenance conveyed his fear.
Symbolise	To represent something else.	A sun might _____ light or happiness.
Diatribe	Another word for a rant.	The Duke's _____ about his last wife shows the level of his irritation.

Key Quotes: 'Notice Neptune though, / Taming a sea-horse'   'I choose / Never to stoop'   'I gave commands; / Then all smiles stopped together'

Writer's Craft:	Explanation
What's the effect of using 'my'?	It suggests possession, as if the Duchess belongs to the Duke.
Why does Browning include the detail about only the Duke opening the curtains?	The curtains are in front of the picture of the Duchess; this detail allows Browning to demonstrate the Duke's desire to dominate: he controls who sees his Duchess (in a way he couldn't when she was alive).
The poem is a dramatic monologue. How does this make the Duke seem controlling?	It makes it seem as though the Duke even wants to control the conversation as no-one else (e.g. the emissary) is allowed to speak.
The poem is written as a single stanza. How does this make the Duke seem dominating?	It gives the reader little pause from the Duke's speech; it is as if we are being dominated by his words.
The Duke says 'I choose never to stoop'. Why does Browning include this?	To stop means to bend down. The Duke sees himself as superior (more important than) other people and thinks he would be lowering himself to even tell the Duchess that he is disgusted with her.
It is hinted that the Duke kills his wife. Why has Browning included this detail?	This shows the Duke's obsession with control – he is so infuriated that he can't fully control his wife's physical responses (e.g. blushing) that he has her killed. It also shows how immoral the Duke is and how power can be abused.
What does the statue of Neptune taming a seahorse in this poem symbolise?	Neptune is the Roman god of the sea; a seahorse is a weak creature in comparison, but one that is wild. The statue symbioses how the Duke sees himself: as an almost omnipotent figure who has to tame his 'wild' wife (by killing her and then controlling who sees her blush by putting her portrait behind a curtain).
How does evidence about the Duke build up over the poem?	The reader's impression of the Duke builds up gradually. As the poem progresses, there is more and more evidence that he is controlling, jealous and paranoid. This builds to the dramatic hint that he had his wife killed because he was irritated her, followed by his quick switch to the topic of his next marriage. This shows him to be immoral and remorseless.

English: 'London' – Knowledge Organiser

What happens in the poem? It's the late 1700s. The persona (Blake we might imagine) walks around the poor streets of London by the Thames river and comments on what he sees. What he sees is misery: in every face he looks at. He thinks about those who are especially powerless in this miserable city and how the powerful in society are responsible for their suffering: children work in dangerous conditions but the powerful church does nothing about this; kings and governments send soldiers off to die in their wars. In all the sounds of suffering that he hears he sees that people are metaphorically imprisoned, mental slaves. Although they are not physically trapped, they are trapped in their misery and slaves to the city or the powerful people within it.

What is the context of the poem?

- The poem was written in the 1790s.
- London was (and is) the capital city of the United Kingdom.
- As a capital city, it is where the power is: it's where the king lives, it's where the government meets.
- London was at the centre of the rapidly-growing British Empire and was a place where extreme wealth could be found (as today).
- However, it was a place of extremes: it was also a place of extreme poverty (as today).

What is the significance of the title? The poem describes Blake's view of London poverty; however the word London has connotations of power because it is the capital and so hints at the idea of powerlessness.

What are the central ideas in this poem?
- London is a miserable and nightmarish place for the poor.
- People are trapped in lives of misery because they are powerless (or feel powerless) to make changes to their lives.
- The powerful don't care about the suffering of ordinary people.
- Childhood is destroyed by city life.

For more revision of this poem, search for 'William Blake London Lit Charts'.

Key Vocabulary	Definition	Example
Nightmarish	Extremely upsetting and very unpleasant or frightening.	The poem describes a dark and _____ world without hope.
Wealth	A large amount of money or valuable things that someone has.	It has been argued that some people have too much money and that _____ should be shared more evenly.
Poverty	The condition of being extremely poor.	In a city like London, it is possible to see great wealth but also great _____.
Freedom	1. The power or right to act, think or speak as you want. 2. The state of not being imprisoned or enslaved.	She gained her _____ after 10 years of imprisonment.
Slavery	The condition of being owned by someone and forced to do their work or obey them.	We often associate _____ with the past, but the sad truth is that there are people in this country who are 'owned' by criminal gangs.
Restriction	Something that limits your actions or movements.	There is a _____ on what you are allowed to do before you are 18.
Misery	Great unhappiness.	It wasn't just sadness that I saw when I visited the town; it was _____.
Woe	Extreme sadness.	I cried when I heard his story: it was such a tale of _____.
Repetition	Writing (or saying) something more than once in order to emphasise it.	The writer uses _____ of the word 'every'

Key Quotes: 'mind-forged manacles'   'chartered Thames'   'chimney-sweeper's cry'

Writer's Craft:	Explanation
Why does the title 'London' connote power and control?	London is the capital city: it is where the king is based and where government meets. It is where all the important decisions that affect ordinary people's lives are made.
How does the use of the word 'chartered' suggest a lack of freedom?	It means that there are rules and restrictions about how places can be used: the streets and the river are effectively owned. Describing the Thames in this was is interesting as we would normally associate nature with freedom.
What is Blake trying to emphasise through repetition of the word 'every'?	He's trying to make it clear that suffering is omnipresent (everywhere) in this part of London: it's not just one or two people in this miserable state. It suggests that it's a problem with society rather than individual people.
What is Blake trying to emphasise through repetition of the word 'cry'?	Cry can mean 'shout' but it can also mean to call out in pain. Repeating it suggests that pain is also omnipresent (everywhere) in this part of London.
What is Blake suggesting through the image of the mind-forged manacles?	He's suggesting that the people he sees are trapped in their misery through invisible slavery (the manacles (handcuffs) are in the mind rather than physically imprisoning them. It could be that they are 'slaves' because they are ordinary poor people without the power to change the system; it could be that they have been trained to think that this misery is a normal part of life and so can't even imagine trying to change anything.
What do the words 'cry', 'tear' and 'woe' have in common? What is Blake suggesting?	They are part of the semantic field of suffering (i.e. they are all words to do with suffering). Blake is making us constantly aware of how much suffering there is in London.
What does the metaphorical blood on the palace walls represent?	It symbolises the blood shed by soldiers who have fought in wars on behalf of the palace (i.e. the king and the government).
How does the end of the poem suggest that the misery will continue?	There is no hope mentioned. The next generation seem already 'infected' and cursed to suffer.

21

Subject vocabulary
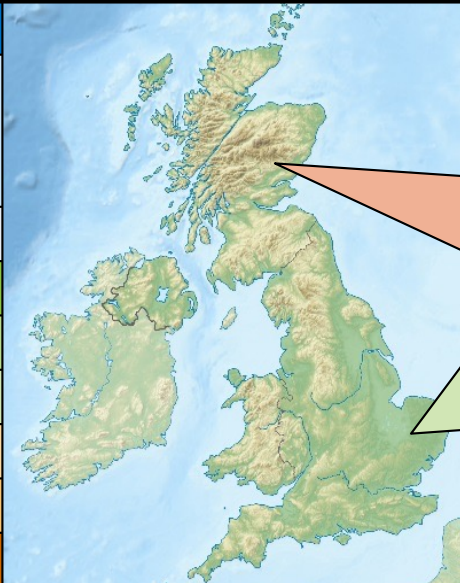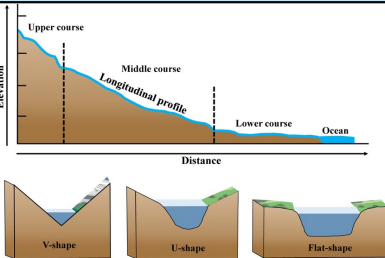
Ready to test your knowledge?
Scan this QR code to access **Quizlet**
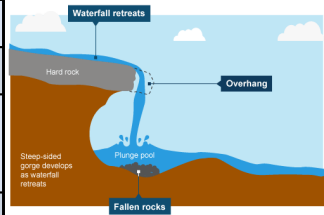
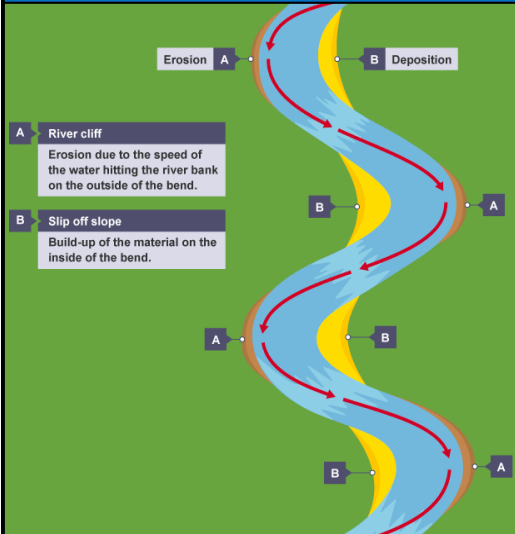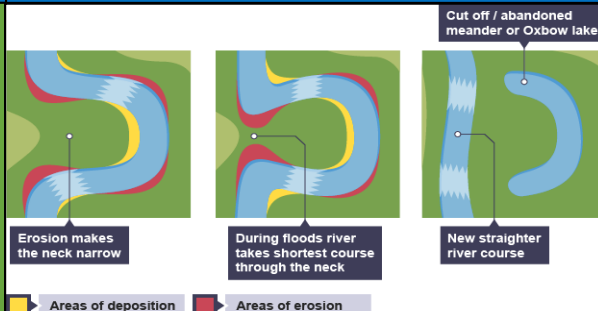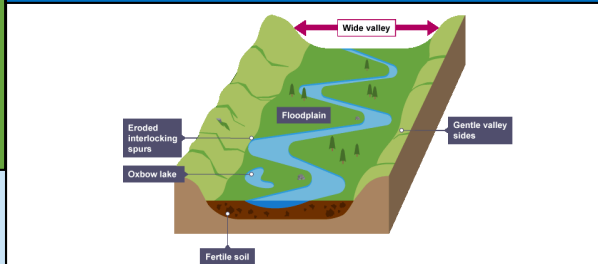| Term	Definition
Tributaries	A river or stream flowing into a larger river/lake.
Confluence	The point where two rivers/ tributaries meet
Watershed	The edge of the drainage basin
Mouth	Where the river ends
Source	Where the river begins
Drainage basin	A river basin or drainage basin is an area of land drained by a river and its tributaries.
Long profile	Shows the gradient of a river as it journeys from source to mouth. The source of a river is where it starts, and the mouth is where it reaches the sea.
Cross profile	A cross profile is from one side of the valley to the other, so basically includes the whole cross section of the drainage basin from one watershed to the other
Cross section	A cross section is essentially a slice of river channel- it is a lot smaller!
Erosion	The breaking up of material and the transportation away. Differential erosion means erosion that happens at different rates. Erosion types are: Hydraulic power (coasts) action (rivers), abrasion, attrition and solution.
Weathering	The breaking down of rock in situ (in the same place). Split into three main categories: Chemical, mechanical and biological.
Vertical erosion	Is erosion in a downward direction. It is dominant in the upper course.
Lateral erosion	Is erosion in a sideways direction. It is dominant in the middle course.
Velocity	A river's velocity refers to the speed at which water moves through its channel.
Thalweg	The line that connects the lowest points in a valley or river channel, and thus the line of fastest flow or deepest water along a river's course.
Helicoidal flow	Helicoidal flow is the cork-screw-like flow of water in a meander. It is one example of a secondary flow. Helicoidal flow is a contributing factor to the formation of slip-off slopes and river cliffs in a meandering section of the river.
Hydrograph	A hydrograph may be used to show how the water flow in a drainage basin (particularly river runoff) responds to a period of rain.

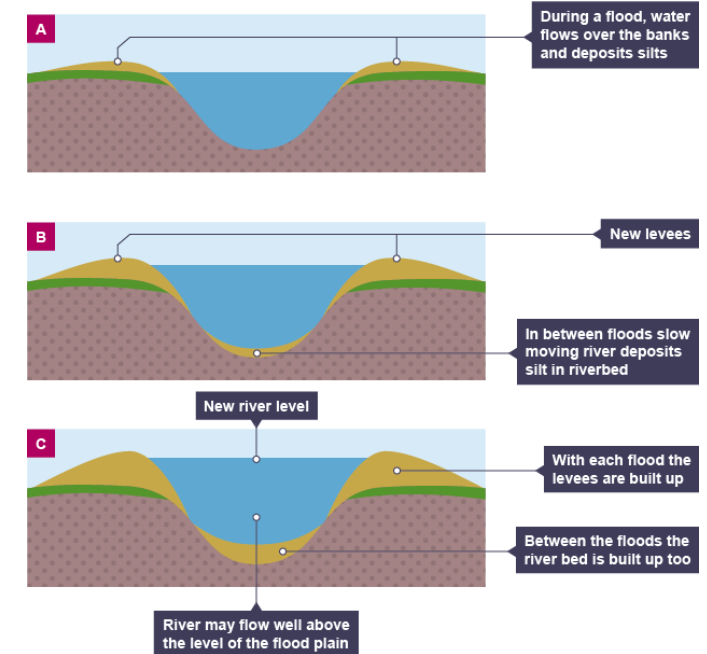| Term	Definition
Lag time	The difference between peak rainfall and peak discharge on a hydrograph. Essentially, it shows how a river reacts to a rain event (how long it takes for water to get to the river).
Discharge	This is the total volume of water flowing through a channel at any given point and is measured in cubic metres per second (cumecs).
Permeable	Allowing fluid to pass through.
Impermeable	Not allowing fluid to pass through.
Evaporation	The process of turning from liquid into vapour.
Transpiration	Transpiration is the process where plants absorb water through the roots and then give off water vapor through pores in their leaves.
Evapotranspiration	Evaporation and transpiration combined
Condensation	The conversion of a vapour or gas to a liquid.
Percolation	When water moves through the rock
Infiltration	When water moves through the soil
Groundwater flow	Water that flows through the rocks
Through flow	Water that flows through the soil
Surface run- off	Water that runs over the surface e of the land
Soft engineering	Management strategies that work with nature, without interrupting natural processes
Hard engineering	Management strategies that are artificial/ manmade- disrupting natural processes
Fetch	The distance over which the wind blows over open water
Swash	When a wave breaks, water is washed up the beach
Backwash	When the water runs back down the beach
Constructive wave	Adds material to the beach. Swash stronger than backwash.
Destructive wave	Takes material away from the beach. Backwash stronger than swash.
Concordant coastline	Generally, creates straighter coastlines; different rocks running parallel to the sea.
Discordant coastline	Created headlands and bays; different rocks at right angles to the sea
Longshore drift	The movement of beach sediment down a coastline in a zig-zag motion.
Mass movement	A movement of rock/ soil downwards under the force of gravity. Heavy precipitation is usually the trigger. Falls, slides and slumps move quickly, soil creep moves slowly.

22

Relief of the UK

Relief of the UK can be divided into uplands and lowlands.

Key

Lowlands	
Uplands	

Areas +600m: Peaks and ridges cold, misty and snow common. i.e. Scotland

Areas -200m: Flat or rolling hills. Warmer weather. i.e. Fens

Types of Erosion

The break down and transport of rocks – smooth, round and sorted.

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

Types of Transportation

A natural process by which eroded material is carried/transported.

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.

Long and cross profiles

The long profile of a river shows it's gradient (angle) and length of a river from a rivers source (start) to its mouth (end).

A river can be broken into three different parts using a long profile these parts are called: Upper course, Middle course and the Lower course.

Long profiles are useful because they show how the steepness and width of a river changes from its source to it's mouth.

Cross profiles

A cross profile shows a cross-section of a river's channel and valley at a certain point along the river's course.

What is deposition?

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

The upper course- landforms created by erosion

Large angular boulders, Steep valley sides, V-shaped valley, Interlocking spurs, Vertical Erosion & Narrow river profile

Interlocking spurs	As the river erodes the landscape in the upper course, it winds and bends to avoid areas of harder more resistant rock. This creates interlocking spurs, which look a bit like the teeth of a zip.
V- shaped valley	Rivers begin high up in the mountains so they flow quickly downhill eroding the landscape vertically. The river cuts a deep notch down into the landscape using hydraulic power. As the river erodes downwards the sides of the valley are exposed to freeze-thaw weathering which loosens the rocks (some of which will fall into the river) and steepens the valley sides.
Rapids	Bands of hard rock are hard to erode so they protrude up on the river bed. Soft rock eroded more easily so river bed is lowered. Turbulence and white water as the river passes over the hard rock.
Waterfalls & gorges	Waterfalls often form where the river flows over different bands of rock. The soft rock erodes more quickly, undercutting the hard rock. The hard rock is left overhanging and because it isn't supported, it eventually collapses. The fallen rocks crash into the plunge pool. They swirl around, causing more erosion. Over time, this process is repeated and the waterfall moves upstream. A steep-sided gorge is formed as the waterfall retreats.

Formation of waterfalls

1) River flows over alternative types of rocks.

2) River erodes soft rock faster creating a step.

3) Hard rock above is undercut leaving cap rock which collapses providing more material for erosion.

4) Further hydraulic action and abrasion form a plunge pool beneath.

5) Waterfall retreats leaving steep sided gorge.

23
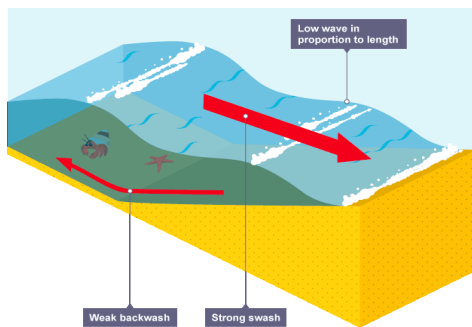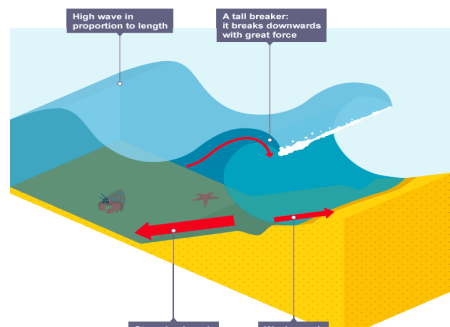
The middle course- landforms created by erosion and deposition

Wider than upper course, Faster flow, Flatter valley, Wider valley, Smaller rocks, Rounded rocks as well as angular rocks & Deep sections.

As the river makes its way to the middle course, it gains more water and therefore more energy. Lateral erosion starts to widen the river. When the river flows over flatter land they develop large bends called meanders.

Meander formation

1	In the early stages of meander formation water flows slowly over shallow areas (riffles) in the riverbed and faster through deeper sections (pools). This eventually creates a flow known as helicoidal flow that corkscrews across from one bank to another- starting the erosion and deposition process that shapes a meander.
2	As a river goes around a bend, most of the water is pushed towards the outside. This causes increased speed and therefore increased erosion. On the outside of the bend the water in the river flows fast, causing lateral erosion through abrasion and hydraulic action which undercuts the bank and forms a river cliff.
3	On the inside of the bend the river flows slower because the channel is shallower and there is more friction. This results in sand and pebbles being deposited and a slip- off slope being created.
4	The top part of the helicoidal flow hits the outside bank and erodes it. The flow then corkscrews down to the next bend, where it deposits the load as the friction slows the flow.
5	Fast flow causes vertical erosion on the outside bend. This deepens the river bed, resulting in an asymmetrical profile.

Ox- bow lake formation

1	The meander loop becomes very large. Only a narrow strip now separates the river channel (meander neck). Lateral erosion continues and the neck becomes increasingly narrow.
2	The river floods therefore the main flow of water cuts through the neck. This shortcut begins to break down the banks and carve a new channel.
3	The floods recede so the river goes back to its normal meandering channel. The process is repeated again with every flood event. The new channel becomes so established with continued lateral and vertical erosion that it become the main channel.
4	The loop of the old river channel is increasingly detached as it is no longer receiving the river water. Flooding which now occurs causes deposition on the new river banks. This helps the old loop to become detached from the channel.
5	Marsh plants colonise the area between the new channel and the old neck. This further widens the gap. In time only the far end of the meander loop is left, sometimes several meters from the main channel. This is the oxbow lake.

Meanders

Lateral erosion through meander migration slowly carves out a flood plain

Ox-bow lakes

Flood plains

The lower course- landforms created by deposition

In the lower course, the river has a HIGH VOLUME and a LARGE DISCHARGE. The river channel is now deep and wide and the landscape around it is flat. However, as a river reaches the end of its journey, energy levels are low and deposition takes place. Velocity is at its greatest here, as there is less contact with the bed and the banks (as a larger and deeper channel) so there is less friction.

Flood plain formation

A flood plain is a large area of flat land either side of a river that is prone to flooding. A floodplain is a very fertile area due to the rich alluvium deposited by floodwaters.

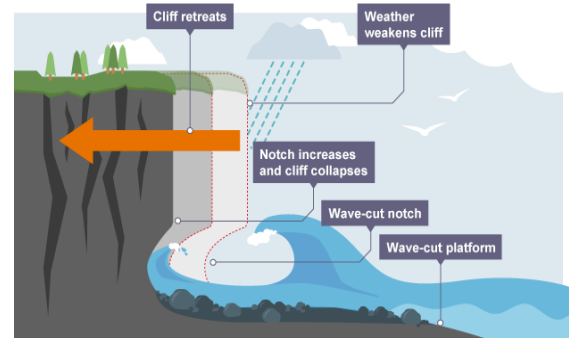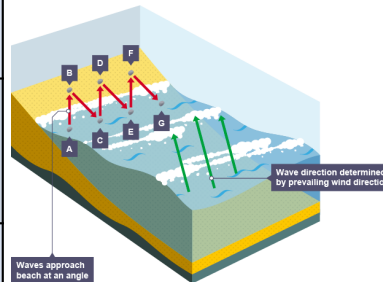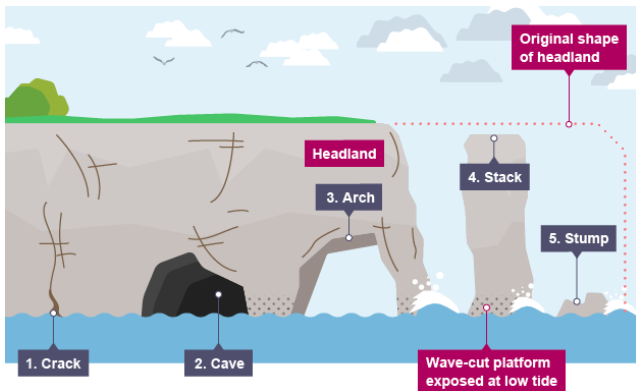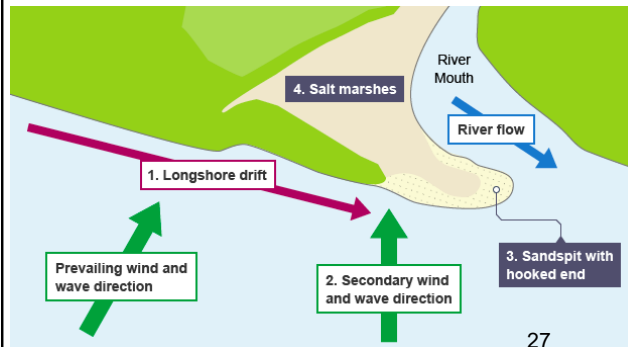|	
1	Rivers flood on a regular basis. The area over which they flood is known as the floodplain. This area of land is the wide and flat valley floor in the lower course of the river.
2	When rivers flood their velocity is slowed and deposition of any rocks being transported is encouraged. this leaves a layer of sediment across the whole floodplain. After several floods, layers of sediment build-up on the flood plain.

24
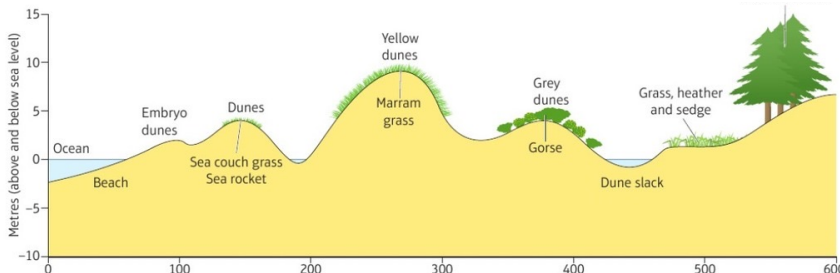
Levee formation

A levee is a raised bank formed on the banks of a river, in the lower course. Levees are formed by the repeated flooding of the river. When the river floods, during periods of high energy, the water and the load it is carrying will leave the channel.

1	Levees occur in the lower course of a river when there is an increase in the volume of water flowing downstream and flooding occurs.
2	Sediment that has been eroded further upstream is transported downstream.
3	When the river floods, the sediment spreads out across the floodplain.
4	When a flood occurs, the river loses energy. The largest material is deposited first on the sides of the river banks and smaller material further away.
5	After many floods, the sediment builds up to increase the height of the river banks, meaning that the channel can carry more water (a greater discharge) and flooding is less likely to occur in the future.

Estuaries

- An estuary is formed at the point where the river meets the sea. It is the tidal part of the river where freshwater from the river meets the salt water of the sea.
- The original channel of the river is now on the estuary floor where it provides a deep channel for shipping.
- Mudflats form in the tidal areas where the water flows slowly.
- A river transports alluvium down to the sea, and incoming tide transports the sand and silt up the estuary.
- Where the fresh water meets with the salty water, the velocity is reduced causing the alluvium to be deposited. This builds up layers of mud called mud flats.

Levees

A — During a flood, water flows over the banks and deposits silts

B — New levees. In between floods slow moving river deposits silt in riverbed

C — New river level. With each flood the levees are built up. Between the floods the river bed is built up too. River may flow well above the level of the flood plain

Physical and Human Causes of Flooding.

Physical: **Prolong & heavy rainfall:** Long periods of rain causes soil to become saturated leading runoff.	*Physical:* **Geology:** Impermeable rocks causes surface runoff to increase river discharge.
Physical: **Relief:** Steep-sided valleys channels water to flow quickly into rivers causing greater discharge.	*Human:* **Land Use:** Tarmac and concrete are impermeable. This prevents infiltration & causes surface runoff.

An example of a river and its features: The River Tees

Located in the North of England and flows 137km from the Pennines to the North Sea Middlesbrough.	**Upper** – Features include V-Shaped valley, rapids and waterfalls. High Force waterfall drops 21m and is made from harder Whinstone and softer limestone rocks. **Middle** – Features include meanders and ox-bow lakes. The meander near Yarm (Sockburn) encloses the town. **Lower** – Greater lateral erosion creates features such as floodplains & levees. Mudflats at the river's estuary.

Flood management

Hard engineering	Soft engineering
- Dams and reservoirs - Channel straightening - Embankments - Flood relief channel	- Flood warnings and preparation - Planting trees - River restoration - Flood plain zoning

Hydrographs and River Discharge

River discharge is the volume of water that flows in a river. Hydrographs who discharge at a certain point in a river changes over time in relation to rainfall

1. **Peak discharge** is the discharge in a period of time.

2. **Lag time** is the difference between peak rainfall and peak discharge.

3. **Rising limb** is the increase in river discharge.

4. **Falling limb** is the decrease in river discharge to normal level.

Flood management scheme: Cockermouth, Cumbria

Cockermouth is an ancient market town in Cumbria, England, at the confluence of the River Cocker as it flows into the River Derwent.

Why was the scheme needed? Town holds heritage value- The area around the River Cocker is a designated Site of Special Scientific Interest (SSSI). Tourism is a vital part of the local economy. Flooding in 2009 caused £276 million in damages. 45% of this was to local businesses/ economy.

Flood management scheme: Cockermouth, Cumbria

Flood management strategy (£4.4m):
- 190m of new flood defences, built with a reinforced concrete base and masonry/brick clad walls.
- 515m of existing flood defence walls were raised and a 180m long clay cored earth embankment was built.
- 120-metre innovative **self-closing flood barriers** (the first time this barrier has been used in this application in the UK), which rise automatically when the river is in flood. This innovative approach helps to retain views of the river throughout the rest of the year, as the barriers only close when required.
- Flood proofing to existing properties
- installation of eight flood gates
- 65 metres of glass viewing panels, all constructed within and on top of the new walls.

Disadvantages	Advantages
• The scheme undervalued the importance of upstream management, rewilding and soft engineering. • Homeowners still face higher home insurance premiums • The reality is, no matter the flood defence Scheme Cockermouth is situated on a confluence- it will always be under the threat of flooding	• Barriers are preserved underground to preserve the natural beauty • The scheme has a designed life of 100 years and requires minimal maintenance • Does not require any human intervention during a flood warning as the barriers self-close when the river reaches a certain level • Residents receive a text when barriers rise- giving them time to prepare

How do waves form?

Waves are created by wind blowing over the surface of the sea. As the wind blows over the sea, friction is created - producing a swell in the water.

Why do waves break?

1	**Waves start out at sea.**
2	**As waves approaches the shore, friction slows the base.**
3	**This causes the orbit to become elliptical.**
4	**Until the top of the wave breaks over.**

Types of Waves

Constructive Waves	Destructive Waves
This wave has a **swash that is stronger** than the backwash. This therefore builds up the coast.	This wave has a **backwash that is stronger** than the swash. This therefore erodes the coast.

Weathering

Mechanical	Weathering processes that cause physical disintegration or break up of exposed rock without any change in the chemical composition of the rock, for example, **freeze thaw.**
Chemical	Is caused by a chemical reaction, **Carbonation** is when carbonic acid in rainwater reacts with calcium carbonate in limestone to form calcium bicarbonate. This is soluble, so limestone is carried away in solution.
Biological	Is the effect that living organisms, such as plants and animals, have on rock.

Mass Movement

The downhill movement of weathered material under the force of gravity. The speed can vary considerably.		
1	Rain saturates the permeable rock above the impermeable rock making it heavy.	
2	Waves or a river will erode the base of the slope making it unstable.	
3	Eventually the weight of the permeable rock above the impermeable rock weakens and collapses.	
4	The debris at the base of the cliff is then removed and transported by waves or river.	

Size of waves

- **Fetch**: how far the wave has travelled
- **Strength** of the wind.
- **Duration**: How long the wind has been blowing for.

Freeze-thaw weathering

1. Water seeps into cracks and fractures in the rock.

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

3. Repeated freeze-thaw cycles, the rock breaks off.

Mass Movement Types

Falls	Bits of rock fall off the cliff face, usually due to freeze-thaw weathering.
Slides	Saturated soil or large blocks of rock slide downhill following a straight slip plain
Slumping	Saturated mass rotates back on itself; follows a concave (curved) slip plain
Soil creep	A very slow on very gentle slopes because of the way soil particles repeatedly expand and contract in wet and dry periods.

26

Geology and Rock Type

The most important feature of a coast is often the type of rock in the area. Some rocks are resistant to erosion, whereas other rocks are more easily eroded.

Resistant rocks= hard igneous rocks e.g. Granite and basalt
Fairly resistant= sedimentary rocks e.g. Sandstone, chalk and limestone
Least resistant= weak sedimentary rocks e.g. Clay and shale.

Types of coastline

Discordant	This is where the coastline is made up of both hard and soft rock. They are usually at right angles to the coast. Discordant coasts often produce headlands and bays
Concordant	This is where the coastline is made up of hard and soft rock that run parallel to the coastline. This means the rock erodes at different rates. Concordant coasts often produce straighter coastlines.

Headlands and Bays

Headlands: Is a cliff that protrudes out into the sea, so it is surrounded by water on three sides. Headlands are composed of hard rock such granite, chalk or limestone, which are difficult to erode.

A bay is a crescent-shaped indentation in the coastline found between two headlands. It usually has a beach, which may be composed of sand or shingle. They are usually composed of softer rock, which is affected more by erosion than harder rock.

Erosional landforms: wave-cut platforms

A rocky, level shelf at or around sea level representing the base of old, retreated cliffs.

1. Waves through hydraulic power cause erosion at the foot of the cliff.
2. This erosion of a cliff at the base forms a wave cut notch.
3. As the notch grows the rock above it becomes unstable and eventually collapses.
4. The collapsed material is washed away and a new notch starts to form. A wave cut platform is left behind as the cliff retreats

Depositional landforms

Beach – The zone of deposited material that extends from the low water line to the limit of storm waves. The beach can be divided into foreshore and backshore.

Spit – A landform formed when a finger of sediment extends from the shore out to sea when the land changes shape, often at a river mouth. It usually has a curved end because of opposing winds and currents.

Bar – Where a spit grows across a bay, a bar can eventually enclose the bay to create a lagoon. Bars can also form offshore.

Longshore Drift

Erosional landforms: caves, arches, stacks and stumps

Caves, arches, stacks and stumps are erosional features that are commonly found on a headland.

1	Cracks are widened in the headland through the erosional processes of hydraulic power and abrasion.
2	As the waves continue to grind away at the crack, it begins to open up to form a cave.
3	The cave becomes larger and eventually breaks through the headland to form an arch.
4	The base of the arch continually becomes wider through further erosion, until its roof becomes too heavy and collapses into the sea. This leaves a stack (an isolated column of rock).
5	The stack is undercut at the base until it collapses to form a stump.

Transportation process: Longshore Drift

The zigzag movement of sediment along a shore caused by waves going up the beach at an oblique angle (swash) and returning at right angles(backwash). This results in the gradual movement of beach materials along the coast.
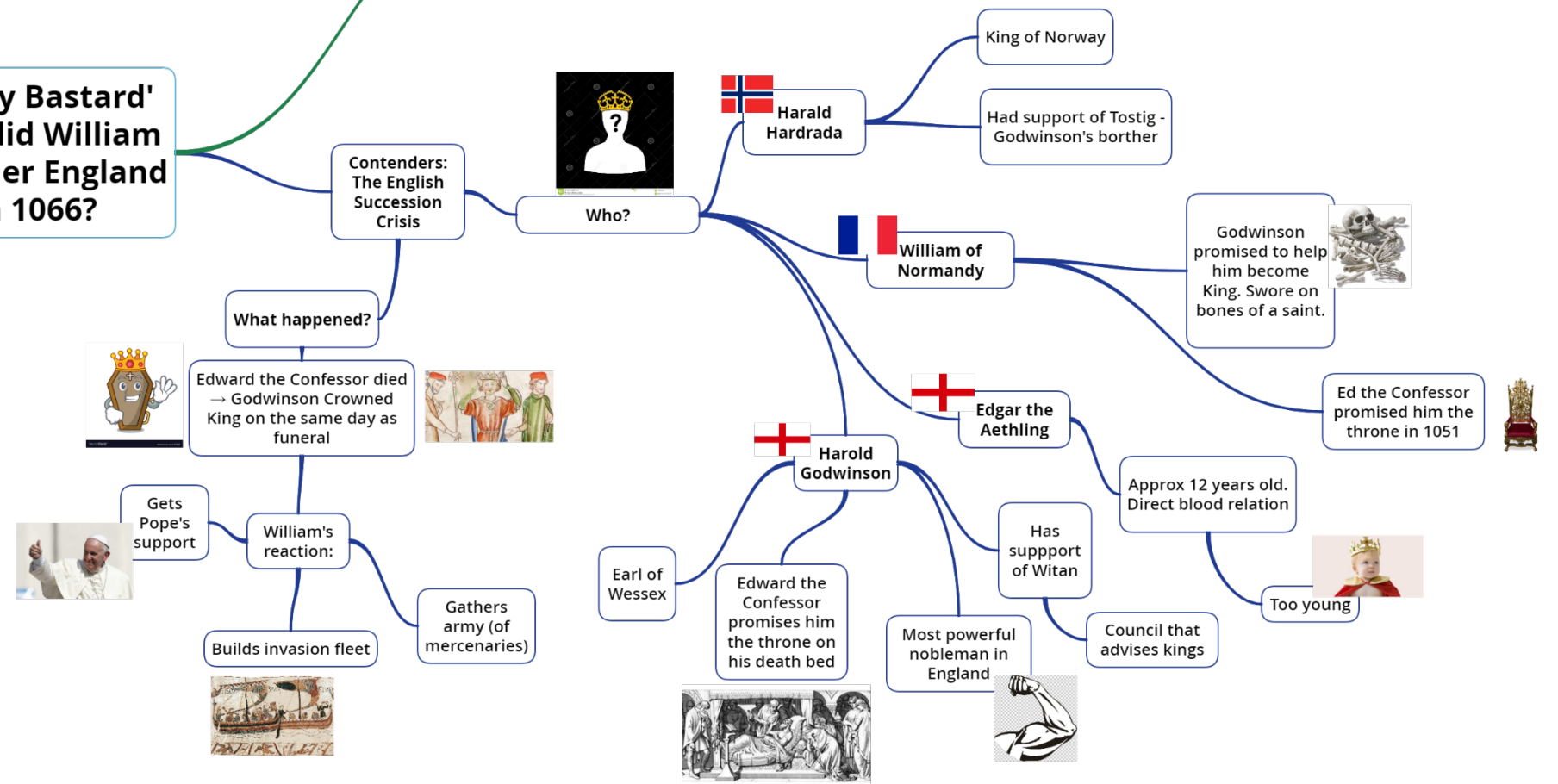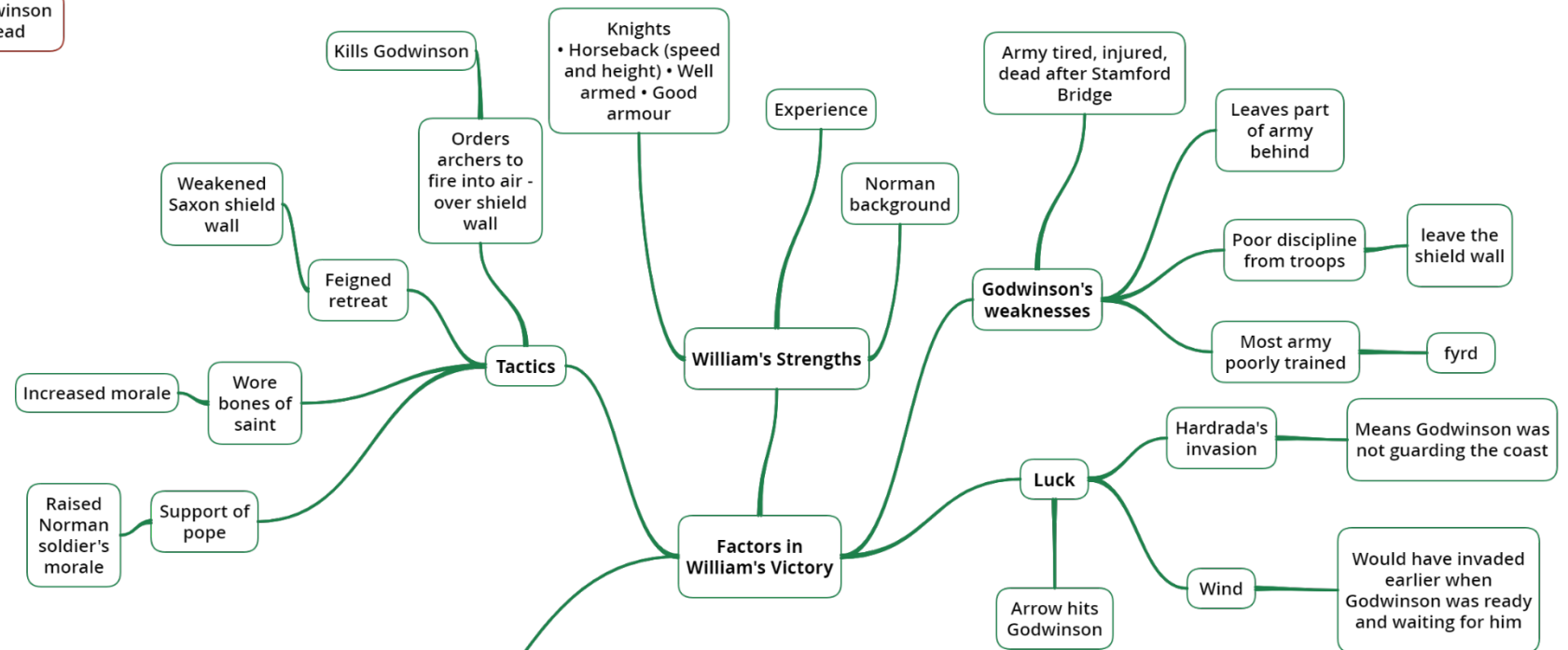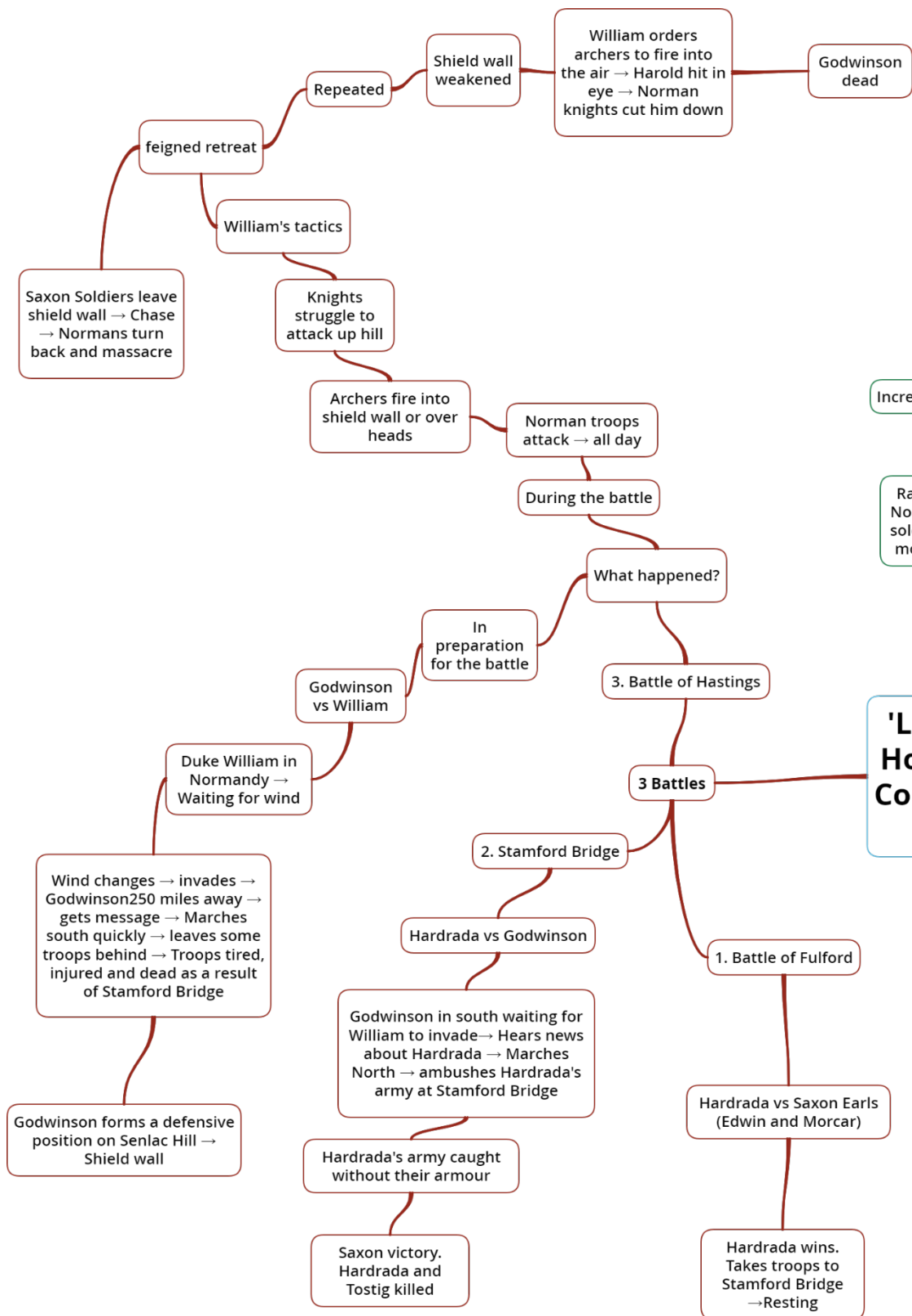
Erosional features on a headland

Sand spit formation

27

Depositional landforms: sand dunes

Sand dunes are hills of sand that can only occur on the coast, where there is enough sand exposed at low tide to dry out and be blown inland.

For a sand dune to form, it needs: a large flat beach, large supply of sand, a large tidal range (so there is time for the sand to dry), an onshore wind to move sand to the back of the beach, and an obstacle such as drift wood for the dune to form against.

Sand dunes develop and change over time and as they change, so too does their biodiversity. The plants that colonise them are highly specialised to survive such dry, dynamic conditions and are not found in any other habitat. This is called **succession**.

An example of a coastline and its features: The Dorset coast

The Dorset Coast, located in the south of England on the English Channel, runs from Lyme Regis in the west, past Old Harry Rocks in Purbeck to Highcliffe in the east. Excluding the shoreline of Poole Harbour, the Dorset coastline is 142 kilometres (88 mi) long.

The area around **Swanage** is made up of bands of hard and soft rock. The soft rock is made of clay and sands, and the hard rock is chalk and limestone.

Chesil Beach is an example of a bar. Sediment has been deposited over time to form a spit. The spit has continued to join to the Isle of Portland. Behind the spit there is The Fleet, a lagoon.

Old Harry Rocks are located on the headland between Swanage and Studland Bay. The headland is made out of chalk, a hard rock. The headland juts out into the sea, so it is more vulnerable to high-energy waves. This caused the formation of Old Harry, a stack. Over time Old Harry will collapse to form a stump.

Coastal Defences

Hard Engineering Defences

Groynes	Wood barriers prevent longshore drift, so the beach can build up.	✓ Beach still accessible. ✗ No deposition further down coast = erodes faster.
Sea Walls	Concrete walls break up the energy of the wave . Has a lip to stop waves going over.	✓ Long life span ✓ Protects from flooding ✗ Curved shape encourages erosion of beach deposits.
Gabions or Rip Rap	Cages of rocks/boulders absorb the waves energy, protecting the cliff behind.	✓ Cheap ✓ Local material can be used to look less strange. ✗ Will need replacing.

Soft Engineering Defences

Beach Nourishment	Beaches built up with sand, so waves have to travel further before eroding cliffs.	✓ Cheap ✓ Beach for tourists. ✗ Storms = need replacing. ✗ Offshore dredging damages seabed.
Managed Retreat	Low value areas of the coast are left to flood & erode.	✓ Reduce flood risk ✓ Creates wildlife habitats. ✗ Compensation for land.

Coastal management scheme: Dawlish Warren, Devon

Why was the scheme needed?
- Long shore drift is a threat to the maintenance of its beautiful beaches.
- The sand spit is important as it reduces flood risk for up to 7,000 properties in the wider Exe Estuary. Businesses and railway worth £158 million.
- Dawlish Warren is also a site of special scientific research (SSSI), an important recreational and leisure facility, not to mention the large amount of visitors and tourists it attracts per year.

Coastal management:	Disadvantages	Advantages
• Wooden groynes & sand dune stabilisation on the spit • Sea wall and rock armour in front of railway • Geotube installed on neck of spit • Broken gabion baskets removed • Beach recharge to widen spit	All of the hard engineering defending the railway are trapping sediment from longshore drift. This is depriving the spit of sediment and is more prone to erosion.	The cost of this scheme was at £14 million but protects businesses and railway worth £158 million

28

'Golden Age' What was England like in 1065?

Religion

1. St Dunstan
- Archbishop of Canterbury
- Good man - devout christian
- tries to improve church
  - End corruption
  - improve education
  - rebuild churches, monasteries etc
- Made a saint after death BUT: Viking raids disrupted church - never as strong again
- reforms not continued

2. King Edward
- Made Robert of Jumieges Archbishop of Canturbury
- Brought Norman priests to England
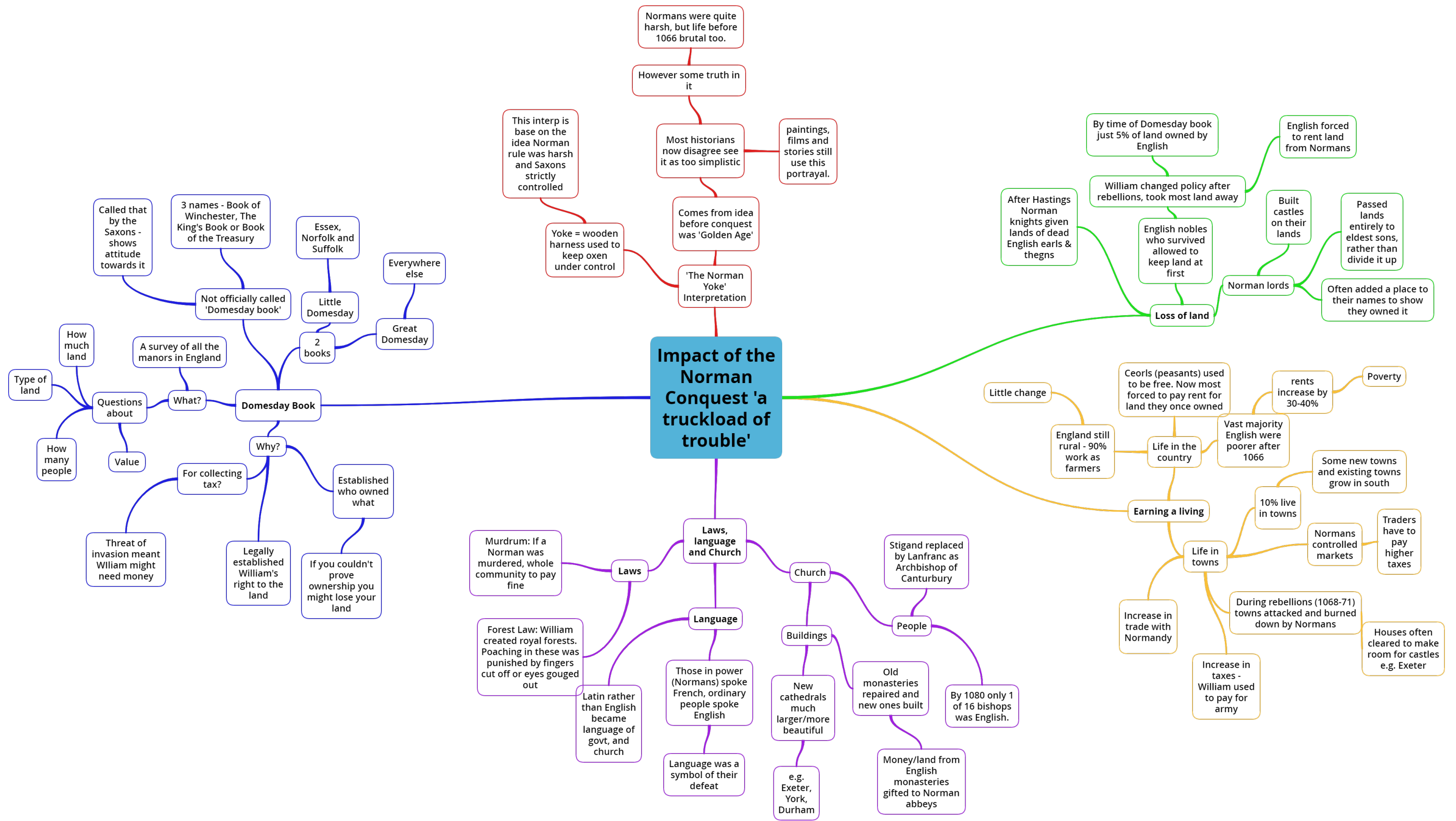- English Earls protest - Godwin forces Edward to make Stigand Archbish of Cant.

3. Stigand
- Bad man!
  - Interested in money not religion
  - No attempt to improve church
- Corruption
  - Pluralism - has more than one church job - also Bish of Winchester
  - Pope tried to force him to give this up - Stigand ignored.
  - Simony - selling church jobs

Churches and worship
- Christianity mixed with pagan practices
- independent from European church
  - parts of bible in English
  - made own saints
- often worship outside
- church teachings ignored
  - Belief in witchcraft & spells
- binge eating, drinking & sex

People

King
- repairs roads, defends country, build burhs etc
- Owns most land
- raises taxes
- Law & order
- church

Earls
- Harold Godwinson = most powerful
- 6 Earls in 1065
- Formed Witan
- King's advisors
- held courts
- but led 'fyrd'
- no private armies

Thegns
- 250 hectares+
- ran courts
- land owners
- collect taxes
- some had burh-geats

Ceorls
- Majority of population
- mostly farmers
- Serve in fyrd (army)
- rent land from thegns
- Richer ceorls owned land and house
- took part in trials
- Early democracy? - had some say in local decisions and helped in trials
- Much less power by 1065

Thralls
- Made slaves by: capture in war, criminals, parents sell children
- branded/castrated
- slaves
- 10% of pop

Women
- legal right to own property
- 'double monasteries' - women in charge
- laws against sexual harrasment
- low class women - work in fields
- Owned 5% of land
- female slaves bought, raped & sold

Culture

Literature
- Poetry
  - Beowulf
  - spoken not read
- Science
  - maps
  - calendars
- History
  - Anglo Saxon Chronicles
  - One sided
  - gaps
- Rude riddles!
- The Exeter Book

Buildings
- most = clay, wood, straw
- few = stone, fine buildings
  - Wilton nunnery
  - Ed' the Confessor's palace at Westminster
  - needed Robert of Jumieges' (a Norman) advice
- Defensive
  - Only 3 motte and bailey castles
  - All built by Ed's Norman friends
  - burh-geats
  - little burghs
  - burhs
  - Fortified (defended) villages

Art
- e.g. Bayeux Tapestry
- Skilled embroiderers/weavers.
- Famous for jewellery/metal work
  - Alfred Jewel
  - Fuller Booch
  - Expensive & rare
- Stolen by Viking raiders

'Lucky Bastard' How did William Conquer England in 1066?

3 Battles

3. Battle of Hastings

During the battle
- Norman troops attack → all day
  - Archers fire into shield wall or over heads
    - Knights struggle to attack up hill
      - William's tactics
        - feigned retreat
          - Saxon Soldiers leave shield wall → Chase → Normans turn back and massacre
          - Repeated
            - Shield wall weakened
              - William orders archers to fire into the air → Harold hit in eye → Norman knights cut him down
                - Godwinson dead

What happened?

In preparation for the battle
- Godwinson vs William
  - Duke William in Normandy → Waiting for wind
    - Wind changes → invades → Godwinson 250 miles away → gets message → Marches south quickly → leaves some troops behind → Troops tired, injured and dead as a result of Stamford Bridge
    - Godwinson forms a defensive position on Senlac Hill → Shield wall

2. Stamford Bridge
- Hardrada vs Godwinson
  - Godwinson in south waiting for William to invade→ Hears news about Hardrada → Marches North → ambushes Hardrada's army at Stamford Bridge
  - Hardrada's army caught without their armour
    - Saxon victory. Hardrada and Tostig killed

1. Battle of Fulford
- Hardrada vs Saxon Earls (Edwin and Morcar)
  - Hardrada wins. Takes troops to Stamford Bridge →Resting

Factors in William's Victory

Tactics
- Kills Godwinson
- Orders archers to fire into air - over shield wall
- Weakened Saxon shield wall
- Feigned retreat
- Wore bones of saint
  - Increased morale
- Support of pope
  - Raised Norman soldier's morale

William's Strengths
- Knights • Horseback (speed and height) • Well armed • Good armour
- Experience
- Norman background

Godwinson's weaknesses
- Army tired, injured, dead after Stamford Bridge
- Leaves part of army behind
- Poor discipline from troops
  - leave the shield wall
- Most army poorly trained
  - fyrd

Luck
- Hardrada's invasion
  - Means Godwinson was not guarding the coast
- Arrow hits Godwinson
- Wind
  - Would have invaded earlier when Godwinson was ready and waiting for him

Who?

Harald Hardrada
- King of Norway
- Had support of Tostig - Godwinson's borther

William of Normandy
- Godwinson promised to help him become King. Swore on bones of a saint.
- Ed the Confessor promised him the throne in 1051

Edgar the Aethling
- Approx 12 years old. Direct blood relation
- Too young

Harold Godwinson
- Earl of Wessex
- Edward the Confessor promises him the throne on his death bed
- Most powerful nobleman in England
- Has suppport of Witan
  - Council that advises kings

Contenders: The English Succession Crisis

What happened?
- Edward the Confessor died → Godwinson Crowned King on the same day as funeral

William's reaction:
- Gets Pope's support
- Gathers army (of mercenaries)
- Builds invasion fleet

30

'Brutal Slaughter' How did William gain full control? 1067-71

1. Reasons to rebel

- Pride
- revenge
  - e.g. Gytha,
- Numbers
  - Saxons way outnumber Normans - reasonable chance of success
- Tax
  - high - esp in 1st 2 yrs
- Loss of land
  - E.g. Edwin & Morcar

2. First uprisings 1066-1068

- William's attempts to avoid rebellions Dec1066-March 1067
  - Edgar, Edwin & Morcar formally surrender to William
  - Built castles e.g. Norwich.
  - Sold back lands to some English Earls/thegns,
  - Loyal Normans put in charge of rebellious areas.
  - South East - Bishop Odo (William's half brother)
  - East Anglia - FitzOsborn (William's BFF)
  - End of march - Will returns to Normandy. Takes Edgar, Edwin & Morcar as hostages
- Coronation Dec 25th 1066
  - Chaos - nearly causes rebellion
  - William wanted to wait but persuaded would increase his authority
- William's approach? Basically peaceful and patient

- Edric the Wild's rebellion Aug 1067
  - 1st rebellion
  - Previously a powerful thegn
  - Lived as outlaw - raided Norman lands
  - William stays in Normandy.
  - Rebellion not serious
  - Raids continue for yrs but no real threat

- Exeter Rebellion Feb 1068
  - Wants revenge
  - Powerful figurehead
  - Was plotting with Irish and Danish
  - (I) Organised by Gytha, Harold Godwinson's mother
  - Shows he is taking it seriously
  - Defenders refuse him entry - he gouges out eyes of hostage
  - (II) William leads army
  - (III) William lays siege to city - digs tunnels under walls.
  - Survive 18days then surrender - plea for peace
  - (IV) William pardons rebels - makes promises
    - won't punish people
    - No extra taxes
    - Won't plunder city
  - Destroys houses to do this
  - Builds castle (Rougemont) to keep control
  - Further castles built at Totnes, Okehampton, Launceston
  - Gytha has lands taken away

3. Rebellions in the North 1068-70

- William's approach? Swift and brutal
- Edwin, Morcar & Edgar organise revolt
- (I) Summer '68 Challenge to William
  - Message to Will - North will fight if he sets foot there.
  - William marches North with army.
  - Builds Castles
    - \Warwick
    - Nottingham
    - York
    - Edwin and Morcar surrender - William pardons them
  - Whilst this going on Harold's sons invade from Ireland - land at Bristol
  - People of Bristol fought them - loyal to William!
- (II) Spring 1069
  - 2nd rebellion in North
  - William crushes in bloody battle
- (III) Winter 1069
  - Gytha persuades Danish king to invade
  - Sends huge invasion fleet
  - Others use opportunity to rebel
    - Edric the Wild - attacks Shrewsbury
    - Uprising in Devon & Cornwall - attack Exeter
    - Exeter remains loyal to William
  - Harrying of the North
    - 100,000 killed
    - Ploughs salt into land
    - Famine - led to canibalism
    - Long lasting impact - still wasteland 16 yrs later when Domesday bk writen
  - William's plan
    - 1. Pay the Danish soldiers to leave
    - 2. Wear his coronation crown in York minster
    - 3. Destroy the land (Harrying of the North)

4. Rebellions in the East 1070-71

- (i) Changes to the Church
  - Stigand replaced as Archbish of Cant.
  - Lanfranc took over his job
  - Priests & monks replaced by Normans
  - Ordered monasteries to provide soldiers - William need funds to fight.
- (ii). Danish invaders return
  - Attack Ely - in East Anglia.
  - Danish King arrives with reinforcements
- (iii). Hereward the Wake
  - Joined forces with Danish.
  - Raided Peterborough Abbey - angry that English Abbot to be replaced by Norman
  - Others join his rebellion - Edwin & Morcar
- (iv) William's response
  - Meets Danish King - negotiates
  - Danes leave
  - Marches army to Ely
    - Uses boats - blocks supplies/ reinforcements getting to Hereward
    - Gets witch to curse from tower
    - Hereward sneaks out - burns tower & witch!
  - Managed to take control of Ely
    - Morcar and leaders imprisoned
    - rebels eyes gouged out or hands cut off
  - Rebellion against William is over
- William's approach? A bit of everything - brutality, negotiation, patience and speed.

31

Norman Castles - Military fortresses or Status symbols?

The Tower of London

The Keep - The White Tower
- Wooden staircase could be removed
- Entrance on 1st floor
- King's apartments on 2nd floor
- Fake windows on 'top floor' hide a walkway for patrolling soldiers

Dates
- Begun between 1075 and 1079
- Finished after William's death in 1087
- Built on site of existing Roman defences
- Originally built in wood - developed over time

- River provides protection

Exeter - Rougemont

Where were Norman Castles built and what did they look like?

1068-1071: The rebellion years
- Other castle builders
  - Chepstow Castle
    - Stone castle
  - William FitzOsborn
    - Will's BFF
    - made Earl of Hereford
    - Built castles on border with Wales
  - Robert of Mortain (Will's half brother)
    - Montacute Castle
- Castles built to protect road to North
  - Huntingdon
  - Cambridge
  - Lincoln
- Approx 35 Castles built
- Way less than after rebellions were over
- Castles built in/near places that rebelled
  - Warwick
  - Nottingham
  - York
    - Most important city in north

What were the castles like?
- Most motte & bailey
- Most made of timber
- Some just 'ringworks'
  - Pevensey
- Few made of stone
  - Chepstow, TofL

1071-1087: After the rebellions
- Most built by Norman barons & knights not by king
- little military finction so just for status?
- Approx 500 castles built
- Way more than when rebellions were happening
- Nearly all built in countryside

What was new about Norman castles?

Saxon burgh-geats
- Built by thegns
- e.g. Goltho in Lincolnshire
- Key features
  - Defensive ditches
  - palisade on top
  - Earth bank
  - gate houses
  - used to show status - bigger = more important
  - wooden buildings inside to live in
- NOT called castles
  - Norman word

First castles in England
- 3 built before 1066
  - Built by Edward the Confessor's Norman friends
  - Richard's Castle, Hereford Castle & Ewyas Castle
- Motte and Baileys

Invasion
After the Battle of Hastings
- Arrived in London - Started work on T of L
- Following battle Will built castles along his route to London - Dover, Newbury, Oxford

- Built castle at Hastings
  - Shown on the Bayeux Tapestry
  - Motte and Bailey

- Used old Roman fortifications at Pevensey - added an earth bank and palisade in one corner
  - no motte

What were castles for?

Military
- Castles built near places of rebellion - Exeter, York
- Little jewellery found in excavations = military
  - e.g. Hen Domen in Wales
- Castles were built by Norman knights to intimidate peasants and keep control
- Biggest concentration of castles is on the Welsh-English border

Status
- More about status
- Gatehouses often looked like those in Saxon bughs (e.g. Exeter) which were built for status
- At Castle Acre in Norfolk created a deer park and diverted a Roman road to give good views
- 80% built in countryside - not strategic positions

Historians disagree - interpretations
- Revisionist interpretations
- Traditional interpretations
  - All about defence
- Recent interpretations
  - Mainly about defence - some use as status symbols

32

Impact of the Norman Conquest 'a truckload of trouble'

Domesday Book

- Not officially called 'Domesday book'
  - Called that by the Saxons - shows attitude towards it
  - 3 names - Book of Winchester, The King's Book or Book of the Treasury
- 2 books
  - Little Domesday
    - Essex, Norfolk and Suffolk
  - Great Domesday
    - Everywhere else
- What?
  - A survey of all the manors in England
  - Questions about
    - How much land
    - Type of land
    - How many people
    - Value
- Why?
  - For collecting tax?
    - Threat of invasion meant William might need money
  - Established who owned what
    - Legally established William's right to the land
    - If you couldn't prove ownership you might lose your land

'The Norman Yoke' Interpretation

- Comes from idea before conquest was 'Golden Age'
  - Most historians now disagree see it as too simplistic
    - However some truth in it
      - Normans were quite harsh, but life before 1066 brutal too.
    - paintings, films and stories still use this portrayal.
- This interp is base on the idea Norman rule was harsh and Saxons strictly controlled
  - Yoke = wooden harness used to keep oxen under control

Loss of land

- After Hastings Norman knights given lands of dead English earls & thegns
- English nobles who survived allowed to keep land at first
  - William changed policy after rebellions, took most land away
    - By time of Domesday book just 5% of land owned by English
    - English forced to rent land from Normans
- Norman lords
  - Built castles on their lands
  - Passed lands entirely to eldest sons, rather than divide it up
  - Often added a place to their names to show they owned it

Earning a living

- Little change
  - England still rural - 90% work as farmers
- Life in the country
  - Ceorls (peasants) used to be free. Now most forced to pay rent for land they once owned
  - rents increase by 30-40%
    - Poverty
  - Vast majority English were poorer after 1066
- Life in towns
  - 10% live in towns
  - Some new towns and existing towns grow in south
  - Normans controlled markets
    - Traders have to pay higher taxes
  - Increase in trade with Normandy
  - Increase in taxes - William used to pay for army
  - During rebellions (1068-71) towns attacked and burned down by Normans
  - Houses often cleared to make room for castles e.g. Exeter

Laws, language and Church

Laws
- Murdrum: If a Norman was murdered, whole community to pay fine
- Forest Law: William created royal forests. Poaching in these was punished by fingers cut off or eyes gouged out

Language
- Those in power (Normans) spoke French, ordinary people spoke English
- Latin rather than English became language of govt, and church
- Language was a symbol of their defeat

Church
- Buildings
  - New cathedrals much larger/more beautiful
    - e.g. Exeter, York, Durham
  - Old monasteries repaired and new ones built
  - Money/land from English monasteries gifted to Norman abbeys
- People
  - Stigand replaced by Lanfranc as Archbishop of Canturbury
  - By 1080 only 1 of 16 bishops was English.

33

Y10C2 Maths Foundation Key knowledge

Item	Description
The sides of a right angled triangle	Hypotenuse (H) Adjacent (A) Opposite (O) Adjacent (to angle x) — x — Hypotenuse — Opposite (angle x)
SOHCAHTOA	$sin(x) = \frac{O}{H}$ $\qquad cos(x) = \frac{A}{H}$ $\qquad tan(x) = \frac{O}{A}$
Correlation	A relationship or connection between two things.
Positive correlation	A pattern on a scatter graph that has a positive gradient.
Negative correlation	A pattern on a scatter graph that has a negative gradient.
Difference	The difference between the terms in a sequence
Nth term rule	A formula that can be use to find any number in a sequence. For example: $$nth\ term = 3n + 2$$ The **15**th number would be 47 because : $3 \times 15 + 2$

	The interior angles of a triangle sum to 180º		Corresponding angles are equal
	Angles on a straight line sum to 180º		Alternate angles are equal
	Angles around a point sum to 360º		Allied (or co-interior) angles sum to 180º
	Vertically opposite angles are equal		

Y10HC2 Key knowledge

Item	Description
Perpendicular line formula	For two straight lines that are perpendicular $$m_1 m_2 = -1$$ The product of the gradients is equal to -1.
Bivariate	Involving or depending on two variables. Eg. A data set containing height and weight for a group of people would be called bivariate data.
Correlation	A relationship or connection between two things.
Positive correlation	A pattern on a scatter graph that has a positive gradient.
Negative correlation	A pattern on a scatter graph that has a negative gradient.
Interpolation	Estimating a value that falls **within** the range of data on a scattergraph.
Extrapolation	Estimating a value that falls **beyond** the range of data on a scattergraph.
Sine rule	$$\frac{a}{sin\,(A)} = \frac{b}{sin\,(B)} = \frac{c}{sin\,(C)}$$
Cosine rule	$$a^2 = b^2 + c^2 - 2bccos(A)$$
Area of a triangle (1)	$$Area = \frac{1}{2} \times base \times height$$
Area of a triangle (2)	$$Area = \frac{1}{2} absin(C)$$
Difference	The difference between the terms in a sequence
Arithmetic or Linear sequence	A sequence of numbers formed by adding or subtracting. Eg. 2, 12, 22, 32…
Geometric sequence	A sequence of numbers formed by multiplying or dividing. Eg. 3, 6, 12, 24…
Quadratic sequence	A sequence of numbers where the second difference is constant. Eg. 5, 10, 17, 26…

Y10 French LC2 Sentence Builder 1: Où habites tu ? Tu aimes ta ville ? Where do you live ? Do you like your town ?

Opinion verb	noun	reasons phrase	verb	noun phrase	connective	phrase
Je n'aime pas (I don't like) Je n'aime pas du tout (I really don't like) Je déteste (I hate)	ma ville (my town) mon village (my village) mon quartier (my district)	car selon moi (because according to me) puisque je pense qu' (because I think that)	il y a (there is/are)	beaucoup du monde (lots of people) beaucoup de voitures (lots of cars) tellement de bruit (so much noise) tellement de gens au chomâge (so many unemplyed) trop de circulation (too much traffic) trop de déchets (too much litter) trop de pollution (too much pollution) peu de commerces (few shops) peu de choses à faire (few things to do) peu de travail (few jobs)	en plus (moreover) aussi (also)	il n'y a pas assez de magasins (there are not enough shops) il n'y a pas assez d'espaces verts (there are not enough green spaces) il n'y a aucun parc (there is no park) il n'y a aucune zone piétonne (there's no pedestrianised areas) c'est sale (it's dirty) c'est bruyant (it's noisy)
Opinion verb	noun	reasons phrase	verb	noun phrase	connective	phrase
J'aime (I like) J'aime bien (I really like) J'adore (I love)	ma ville (my town) mon village (my village) mon quartier (my district)	car selon moi (because according to me) puisque je pense qu' (because I think that	il y a (there is/are) il n'y a pas (there isn't/ aren't)	beaucoup de magasins (lots of shops) beaucoup de parcs (lots of parks) tellement de choses à faire (so many things to do) tellement de gens sympas (so many nice people) trop de circulation (too much traffic) trop de déchets (too much litter) trop de pollution (too much pollution)	en plus (moreover) aussi (also)	il n'y a pas trop du monde (there aren't too many people) il y a beaucoup d'espaces verts (there are lots of green spaces) il y a des parcs (there are parks) il y a des zones piétonnes (there are pedestrianised areas) c'est propre (it's clean) c'est calme (it's calme)

Y10 French LC2 Sentence Builder 2 : Que fais-tu pour protéger l'environnement ? What do you do to protect the environment?

Opinion phrase	verb phrase	noun	verb	verb + noun
Pour moi (For me) Selon moi (According to me) A mon avis (In my opinion) Je pense que (I think that) Je trouve que (I find that)	le problème le plus grave est (the most serious problem is) le problème le moins grave est (the least serious problem is) ce qui m'inquiete est (what worries me is)	le changement climatique (climate change) le déboisement (deforestation) la destruction de la couche d'ozone (the destruction of the ozone layer) la destruction des forêts tropicales (the destruction of tropical forests) la disparition des espèces (the extinction of species) la guerre (war) le manque d'eau douce (the lack of drinking water) la pollution de l'air (air pollution) la sécheresse (drought) la surpopulation (over population) les marées noires (oil spills) des inondations (floods) les tremblements de terre (earthquakes) les typhons (typhoons)	je pourrais (I could) on devrait (we should) il faut (you must)	trier les déchets (sort the rubbish) éteindre les appareils électriques (turn off electrical appliances) baisser le chauffage (turn down the heating) utiliser le papier recyclé (use recycled paper) éviter les produits jetables (avoid disposable products) acheter des produits verts/bio (buy green/organic products) utiliser les transports en commun (use public transport) aller au collège à vélo (go to school by bike) refuser des sacs en plastique (refuse plastic bags) apporter une bouteille d'eau (bring a water bottle) prendre une douche au lieu d'un bain (take a shower instead of a bath) planter des arbres (plant trees) recycler le papier/les canettes/les bouteilles (recycle paper/cans/bottles) utiliser les énergies renouvelables (use renewable energy) participer à des manifestations (participate in demonstrations)

Y10 French LC2 Sentence Builder 3 : Pourquoi être bénévole ? Why be a volunteer ?

Opinion phrase	noun phrase		noun phrase		subclause
Ce qui m'inquiète est (What worries me is)	la pauvreté (poverty)		je soutiens les SDFs (sans domicile fixe) (I support homeless people) je soutiens les gens en pauvreté (I support people in poverty)		c'est notre responsabilité d'aider les autres (it's our responsibility to help others)
	le traitement des animaux (the treatment of animals)		j'aide les personnes âgées (I help elderly people)		je pense que c'est important (I think it's important)
Selon moi un grand problème mondial est (According to me a big world problem is)	l'environnement (the environment) l'exploitation des ouvriers (the exploitation of workers) la solitude (lonliness)	donc alors (so)	je m'occupe des animaux dans un refuge (I look after animals in a shelter) je rends visite aux personnes âgées (I visit the elderly) je participe à des manifestations (I participate in demonstrations)	car parce que puisque (because)	il faut avoir un salaire minimum (you must have a minimum wage) il faut agir (you must act) on devrait essayer de respecter l'homme et l'environnement (we should try to respect people and the environment)
Ce qui est important pour moi est (what is important to me is)	les produits pas chers (cheap products) l'itinérance (homelessness) les enfants qui n'ont pas assez à manger (children who don't have enough to eat)		je fais du bénévolat (I do volunteering) je fais un don à /je travaille pour une association caritative (I donate to/I work for a charity) je travaille avec les personnes âgées/les jeunes (I work with elderly people/young people) je boycotte les grandes marques qui ne respectent pas leurs ouvriers (I boycott big labels that do not respect their workers) j'achete des produits du commerce équitable /des produits verts (I buy fair trade/green products)		ça me permet d'élargir mes compétences (it permits me to gain experience) ça me donne le sentiment d'être utile (it makes me feel useful) ça me donne plus de confiance en moi (it gives me more confidence in myself) c'est mieux pour l'environnement (it's better for the environment)

VOLUNTEER

Y10 French LC2 Sentence Builder 4: Tu es en bonne santé ? Are you fit & healthy ?

Opinion phrase	verb + noun	connective	negative phrase
Je pense que je suis en bonne santé car (I think I'm in good health because) Pour garder la forme (To keep fit) Pour être en forme (To be in shape)	je fais du sport régulièrement (I do sport regularly) je mange sainement (I eat healthily) je bois de l'eau (I drink water) je dors suffisament (I sleep enough) je médite tous les jours (I meditate every day) je me couche de bonne heure (I go to bed early) j'eteins l'écran le soir (I turn off screens in the evening) j'évite les matieres grasses (I avoid fatty foods) je mange rarement des bonbons (I rarely eat sweets)	mais de l'autre côté (but on the other hand) par contre (on the other hand) cependant (however)	je ne fais pas de sport régulièrement (I don't do sport regularly) je ne mange pas sainement (I don't eat healthily) je ne bois pas assez d'eau (I don't drink enough water) je ne dors pas suffisamment (I don't sleep enough) je ne médite pas tous les jours (I don't mediate every day) je ne me couche pas de bonne heure (I don't go to bed early) je n'éteins pas l'écran le soir (I don't turn off screens in the evening) je n'évite pas de matières grasses (I don't avoid fatty foods) je mange toujours des bonbons (I always eat sweets)
Selon moi (According to me) Je trouve que (I find that) A mon avis (In my opinion)	boire de l'alcool (drinking alcohol) se droguer (taking drogs) fumer (smoking) s'isoler (isolating yourself) être accro (being addicted)	est mauvaise pour la santé car (is bad for the health because) n'est pas une bonne idée parce que (isn't a good idea because) 	c'est une perte de temps/d'argent (it's a waste of time/money) c'est très cher (it's very expensive) c'est trop dangereux (it's too dangerous) c'est assez nocif (it's quite toxic) c'est vraiment bete (it's really stupid) on risque d'être malade (you risk getting ill) on risque d'avoir un cancer des poumons/du foie (you risk getting lung/liver cancer) on risque de ne plus se controler (you risk not being in control of yourself)

Y10 French LC2 SB5: Tu es pour ou contre les grands événements ?

Opinion phrase	noun	noun phrase	verb	opinions/adjectives
Je pense que/qu'(+ vowel) (I think that)		permet aux gens de s'amuser (allows people to have a good time)		
Selon moi (according to me)	ce genre d'événement (this type of event)	encourage la pratique du sport (encourages participation in sport)	c'est (it's)	un événement connu dans le monde entier (an event known throughout the world)
A mon avis (In my opinion)	cet événement (this event)	unit les gens (unites people)		le plus grand festival de…au monde (the biggest festival of …in the world)
Je trouve que/qu' (+ vowel) (I find that)		donne des modèles aux jeunes (gives young people role models)		
		attire les touristes (attracts tourists)		

Time marker	past perfect	noun phrase	past + opinion	future tense phrase
L'année derniere (Last year) L'été dernier (Last summer)	je suis allé(e) (I went) on est allés (es) (we went)	à un festival de musique/théâtre/littéraire) (to as festival of music/theatre/literature) à la Coupe du Monde (to the World Cup) voir le Tour de France (to see the Tour de France) aux jeux Olympiques (to the Olympics) au Carneval (to the Carnival)	il y avait un ambience magique (the ambiance was magical) il y avait trop du monde (there were too many people) c'était inoubliable (it was unforgettable) c'était trop cher (it was too expensive)	l'année prochaine je vais y retourner (I'm going to go back there)

40

Year 10 Learning Cycle 2 Sentence Builder 1:

¿A cuál festival espanol te gustaría ir? – To which Spanish festival would you like to go?

Si fuera posible = If it were possible Si tuviera dinero = If I had money Si tuviera tiempo = If I had time	iría a = I would go to visitaría = I would visit participaría en = I would take part in vería = I would see	los Sanfermines en Pamplona	porque se puede = because you can	correr enfrente **de** toros = run in front **of** bulls matar toros = kill bulls **ser** herido/matado = **be** wounded/killed
		las Fallas en Valencia		**ver** los 'ninots'/desfiles/hogueras= **see** the 'ninots'/parades/bonfires desfrazarse = wear fancy dress
		La Tomatina en Buñol		tirar tomates = throw tomatoes divertirse = have fun emborracharse = get drunk
		El Salto del Colacho		**ver la** locura = **see the** madness saltar **sobre** bebes = jump **over** babies disfrazarse **como el** diablo = get dressed **as the** devil
		La Feria en Málaga		escuchar música flamenca = listen to flamenco music bailar = dance **ver los** conciertos = **watch the** concerts
		Semana Santa en Sevilla		observar los desfiles = see the parades **ir a la** misa = **go to the** mass **ver los** disfraces = **see the** costumes
		Els Enfarinats en Alicante		tirar huevos **y** harina = throw eggs **and** flour disfrazarse **como** soldados = get dressed **as** soldiers
		Castells en Tarragona		subir **la** torre = climb **the** tower preocuparse **por los** niños = worry **about the** children

Year 10 Learning Cycle 2 Sentence Builder 2:

¿Cómo es tu zona? – What is your area like?

	es = it is	hermoso/precioso = beautiful bonito = pretty feo = ugly rural = rural industrial = industrial moderno = modern histórico = historic bullicioso = bustling famoso/conocido **por**... = famous/well known **for**…	
Aquí = here **En mi** región = **In my** región **En mi** país = **In my** country	**hay = there is/are**	**mucho que hacer = lots to do** **una** red de transporte público **bueno** = **a good** public transport network **un** centro commercial moderno = **a** modern mall arquitectura interesante = interesting achitecture **mucha** marcha = **lots of** nightlife	**donde… = where…**
	se puede/ puedes = **you can** **debes = you must** **tienes que = you have to**	**hacer** surf = **do** surfing **hacer** senderismo = **do** hiking **hacer** deportes acuáticos = **do** water sports nadar en los ríos = swim in the rivers **ir** de compras = **go** shopping visitar monumentos = visit monuments	**todos los días = every day** a menudo = often **a veces = sometimes** **de vez en cuando = now and again** rara vez = rarely **demasiado = too much** **mucho = a lot** **poco = very little**
	hace buen tiempo = it is good weather hace mal tiempo = it is bad weather hace calor = it is hot hace sol = it is sunny hace frío = it is cold llueve = it rains nieva = it snows		

Year 10 Learning Cycle 2 Sentence builder 3:

¿Prefieres vivir en el campo o en la ciudad? – Do you prefer to live in the town or the country?

En el campo **= in the** countryside	**lo bueno es que =** **the good thing is that** **lo mejor es que =** **the best thing is that** **lo que más me gusta es que =** **the thing I like most is that** **una ventaja es que =** **an advantage is that**	**se puede estar mucho tiempo** al aire libre = **you can be** outside **a lot** **se puede ir** de paseo **en los** bosques = **you can go** for a walk **in the** woods **se puede** disfrutar de la vista = **you can** enjoy the view **es más** tranquilo = **it's more** peaceful **no hay tanto** tráfico/**tantos** coches = **there isn't so much** traffic/cars **la gente se conoce = people know each other**
	se pasa **mucho** tiempo esperando un autobús = **lots of time** is spent waiting for a bus se aprecia el aire fresco = the fresh air is appreciated se encuentra **más** prejuicio = **more** prejudice is found se nota la naturaleza = nature is noted **se hace** senderismo/ bicicleta de montaña = hiking/mountain biking **is done**	
En la ciudad **= in the** city	**lo bueno es que =** **the good thing is that** **lo mejor es que =** **the best thing is that** **lo que más me gusta es que =** **the thing I like most is that** **una ventaja es que =** **an advantage is that**	**se puede hacer un** recorrido en autobús = **you can do a** bus tour **se puede** apreciar la arquitectura variada = **you can** appreciate **the** varied architecture **es tan** fácil desplazarse = **it's so** easy to get around **hay una** red de transporte público fiable = **there's a** reliable public transport network **hay tantas** diversiones = **there's so many** fun things **hay muchas** posibilidades de trabajo = **there's lots** of work possibilities
	se aprecia la cultura = culture is appreciated **se hace** ejercicio en un gimnasio = exercise **is done** in a gym se encuentra **más** trabajo = **more** employment is found se nota la moda = fashion is noted se bebe **más** café = **more** coffee is drunk	

Year 10 Learning Cycle 2 Sentence Builder 4:

¿Quisiera un billete para el aeropuerto por favor? – I'd like a ticket to the airport please?

Part 1

¿Dónde está = Where is? ¿Estoy buscando = I'm looking for	el aeropuerto? = the airport la estación de trenes? = the train station la estación de autobuses? = the bus station	Sigue todo recto = go straight ahead Gira **a la** izquierda = turn **to the** left Gira **a la** derecha = turn **to the** right Tom**a la** primera calle **a la** izquierda = take the first street **to the** left Toma **la** segunda calle **a la** derecha = take **the** second street **to the** right Cruza **el** puente/ **la** plaza/ **los** semáforos = cross **the** bridge/ **the** square/ **the** lights	Está cerca = it's near Está lejos = it's far away

Part 2

Quisiera = I would like	un billete de ida = a single ticket un billete de ida y vuelta = a return ticket	**de** primera clase = **of** first class **de** segunda clase = **of** second class	a… = to hacia = towards **con** destino = **with** a destination
¿Dónde = where **¿Cuándo = when**	sale = leaves llega = arrives	el tren/autocar **para** = the train/ coach **for** el tren/autocar **de** = the train/coach **from**	…?
¿Cuál es la vía/el andén **para = which is the platform for**			

Year 10 Learning Cycle 2 Sentence Builder 5:

¿Qué es el problema mundial más grave en tu opinión? – What is the most serious global problem in your opinion?

Creo que= I think that Pienso **que**= I think **that** **Diría que =** I'd say that Desde mi punto de vista = from my point of view	**el** problema **más** grave = **the** grav**est** problem **el** problema **más** serio = **the most** serious problem **el** problema **más** grande = **the** bigg**est** problem	**en el** mundo = **in the** world **en mi** país = **in my** country **en mi** región = in **my** region **para los** jóvenes = **for the** young people	**es** **=** **is**	**el** paro = unemployment **el** desempleo = unemployment **el** hambre = hunger **la** pobreza = poverty **la** desigualdad = inequality **la** drogadicción = drug addiction **la** salud = health **la** obesidad = obesity **la** contaminación = pollution **el** calentamiento global = global warming **los sin** hogar/techo = the home**less** **el** racismo = racism **el** sexismo = sexism **la** homofobia = homophobia	**para** ayudar **=** **(in order) to** help	compraré = I will buy	productos verdes = green products productos de comercio justo = fairtrade products
					cuidaré = I will care for	**el** planeta = **the** planet
					apoyaré = I will support	proyectos relevantes = relevant projects
					ahorraré = I will sabe	electricidad = electricty
					recaudaré = I will raise	dinero = money
					cambiaré = I will change	**mis** hábitos = **my** habits **las** leyes = **the** laws
					consumiré = I will consume	**menos = less**
					haré = I will do	campañas publicitarias = advertising campaigns

Remember I will in English is often abbreviated to I'll

Music Terminology that you will need to complete written coursework in all Components

Name	

You need to be familiar with the compositional and sonic feature terminology listed below, be able to discuss them in your written work, identify examples in recordings of your choice and use them in your composing/production coursework. The terms are grouped by feature

Compositional Feature	Terms to use	Definition	Relevant Style
Melody	Conjunct Disjunct	Melodies moving in steps (conjunct) or leaps (disjunct)	All styles
	Chromatic	Melodies based on the scale that moves in semitones	All styles
	Diatonic	Melodies based on the major scale	All styles
	Modal	Melodies based on a church mode	All styles
	Pentatonic	Melodies based on the pentatonic (5 note) scale	All styles
	Phrasing	How notes are grouped in "sentences" - tells singers and wind players when to breathe and strings players when to change bow direction	All styles
	Repetition	When a phrase is repeated	All styles
	Sequence	When a phrase is repeated bit each time a steps higher (ascending) or lower (descending) eg Ding Dong - Gloooooria	All styles
	Ornamentation	Decoration added to a note - trill, turn, bend, slide etc.	All styles
	Motif	Short musical idea	All styles
	Round/Canon	When one parts starts the tune and the 2nd part starts the same tune a little later eg Frere Jacques	All styles
	Riff/hook/ ostinato	Short repeated motif or catchy idea	All styles
	Head	The start of the main melody in jazz	All styles
	Improvisation	Making it up on the spot within the context of the chords or relevant scale	All styles

Compositional Feature	Terms to use	Definition	Relevant Style
Harmony	Major & minor triads	Three note chords (Ist, 3rd, 5th) - major (CEG) lighter and happier than minor (CEbG)	All styles
	Power chords	Chords that have no 3rd therefore are neither major nor minor (CG)	Popular styles
	7th Chords	Chords with an added 7th note - CEGBb	All styles
	Sus chords	Chords with a note that moves to resolve to the original triad - CEF becomes CEG	All styles
	Extended chords	Chords the have notes added beyond the 7th in to the next 8ve	All styles
	Suspensions	Notes held through a chord in to the next which then resolve.	All styles
	Inversions	When you change the order of notes of notes in a chord. CEG (Root position) EGC (1st Inversion) GCE (2nd inversion)	All styles
	Chord Sequence	Set order of chords eg 12 Bar blues or I, V, VI, IV	All styles
	Cadence	2 chords that make up the end of a phrase Perfect (sounds finished) V-I, Imperfect (sounds unfinished) IV-V	All styles
	Arpeggios	Notes of a chord played consecutively	All styles
	Broken chords	As above but split between parts	All styles
Tonality Scales & modes	Major scale	T, T, ST, T, T, T, ST- light and happy	All styles
	Minor scale	T, ST, T, T, ST, T+ST, ST dark, sad and moody	All styles
	Blues scale	Scale used in blues and jazz - C, Eb, F, F#, G, Bb	Blues & Popular styles
	Pentatonic scale	5 note scale eg. C D E G A	Popular styles & Oriental styles
	Modes	Aeolian (A-A), Dorian (D-D) etc Scales that came before the Major/Minor tonal system - used in the church choral writing	All styles
	Raga	Indian scale - different ones for differing occasions	World music
	Exotic scales	Further scales used in world music or created scales used in serialism	World music & 20th C classical styles

Compositional Feature	Terms to use	Definition	Relevant Style
Rhythm	Metre	Beats in a bar eg 4/4	All styles
	Tempo/bpm	Speed	All styles
	Syncopation	Offbeat - rhythm moves across the pulse beat - key feature Reggae	All styles
	Swing	Dotted rhythm, hump-ty dump-ty	
	One drop/skanking	One Drop - dropping the bass drum from the Ist beat of the bar giving distinctive reggae feel. Reggae Skank - stressing of offbeats in a 4 beat bar (2 & 4)	Reggae
	Polyrhythm	2 or more different rhythms going on at the same time eg 2 against 3	Samba, minimalism
	Hemiola	Making 2 bars of 3 beats sound like 3 bars of 2 beats	All styles
	Phasing	Shifting 1 phrase out of place by 1 note or beat.	Minimalism
	Regular	Regular even quaver pattern	All styles
	Dotted	Dotted notes giving hump-ty dump-ty rhythm pattern.	All styles
Structure/form	Verse Chorus or song form	Sections of a song eg typical song structure - Intro, verse, chorus, verse, chorus, bridge, chorus x2 ,outro	Popular styles
	Bridge/instrumental	Middle 8 or 16 bars in a pop song - different to the verse and chorus - contrast	Popular styles
	Intro/outro	Opening and ending of a song. Called coda in classical styles	Popular styles
	Strophic	Verse, verse, verse etc	Song styles
	Through composd	Where each verse is set to a new tune. Opposite of Strophic where each verse composed has the same tune (hymns/folk songs)	Song styles
	12 bar blues	12 Bar structure chord sequence common to blues, rock n roll and pop styles	Blues & Popular styles
	Binary/Ternary	A section B Section, ABA	All styles
	Rondo form	ABACAD - where the A section recurrs after each new section	All styles
	Variations	Different versions of an original theme - A, A1, A2, A3 etc	Classical styles
	Ground bass	Recurring bassline where different melodies are built over the top	Classical styles

Sonic Features	Terms to use	Definition
Instrumentation	Playing techniques	Pizzicato, plucked, picked, bowed, flutter tonguing, bottle neck, glissando, muted, double stopping
	Types of ensemble	Band, choir, orchestra, string quartet, jazz combo, duo, trio etc
	Electronic insts.	Synth, computer generated
Texture (layers)	Solo	I single part
	Duet	Duet 2 parts
	Homophonic	Melody & accompaniment
	Polyphonic	Lots of individual lines weaving together
	Monophonic	Single line of sound
	Unison	All singing/playing the same
Timbre	Sonic features	Sound features of an instrument
	Electronic sounds	Synth, computer generated
	FX effects	Reverb, Delay, overdrive, echo, wah-wah, chorus etc
Production	Mic use	Types of mic and how used
	Recording styles	analogue, didgital, stereo tracks, mono track
	Sampling	using small smaples of other msic in a track
	Looping	Where a section is repeated using the curly arrow
	Quantize/Snap	Bringing the MIDI in to time. Snap to grid/bar/beat - moves in to time
	Sequencing	Adding layers (tracks) using a DAW
	Automation	White line and dots (or separate track)that you can use to change volume etc
Digital Effects FX	Reverb	Simliar to echo - can be adjusted to resemble different space sizes, room, church, hall, arena
	Delay	Delays the sound then plays it back. You vary how much it delays.
	Chorus	Doubles the sound but slightly out of phase giving the impression of lots of the same part at the same time
	Flanger/Phaser	Simliar to chorus but Flanger thickens the sound - whooshing sound, Phaser adds a sweeping sound
	Distortion	Distorts the sound of the guitar & amp. Heavy and crunchy sustained sound
	Overdrive	Like distortion but more natural giving more of the orginal guitar sound
	Wah	Adds a "wah" sound to your instrument
	Pan	Shifing the sound from left to right
	Equaliser	Where you can balance the Low Mid & High sound ferquencies
	Compressor	Compresses (limits) the sound signals so it doesn't distort on peaks of volume and raises the lowest volumes
	Fade in/out	Gradually build/lessen the volume level of a track
	Volume	Changes the dynamic level.

RPE: Are humans intrinsically good?

Natural Law

Aquinas built upon Aristotle's Natural Law and the idea that the universe has a natural order that works to achieve an 'end' or 'purpose' (telos).

Aquinas believed there were 5 ends (purposes) for which human beings have been created.

1. To protect life
2. To live harmoniously in society
3. To reproduce
4. To learn
5. To worship God

Any action which provides a means to these ends is considered ´good´.

The natural law is nothing other than the light of understanding placed in us by God; through it we know what we must do and what we must avoid" (St Augustine)

Ethical Decisions

Ethics = *ethos* 'character'
Morality = *moralis* 'customs' or 'manners'
Moral- ethically good or allowed
Immoral – not good/allowed
Amoral - unconcerned with the rightness or wrongness of something

Utilitarianism

Nature has placed mankind under the governance of two masters, pain and pleasure. It is for them alone to point out what we ought to do as well as what we shall do'
Bentham
'All humans are motivated by pleasure and pain'
Pleasure= Good
Pain= evil
'The right actions are those that promote the most good'

Absolute and Relative

Absolute Morality - the belief that an action is right or wrong, no matter what the circumstances.

Relative morality – the belief that right or wrong depends on the circumstances

"Mutual respect for and tolerance of those with different faiths and beliefs and for those without faith"

50

Situation Ethics

Situation Ethics – the idea that Christians should base moral decisions on what is the most loving thing to do.

Agape – Selfless love (caring for others)

•Love should be the only principle upon which to make moral choices

• A good action is one which aims to do the most loving thing. It is based on the teaching of Jesus *'My command is this: love each other as I have loved you.'*
(John 15: 12)

• A person should only obey the rules in the Bible or the Church if that teaching results in the most loving thing to do.

Making moral decisions is not easy and there are many different sources which lead us into making decisions. Some are external such as parents or the law and some are inbuilt such as our conscience

Biology: Blood Knowledge Organiser

The Blood

The blood is a tissue.
It consists of four main components:

red blood cells
white blood cells
platelets
plasma

The cells components (mostly red blood cells) are **suspended** in the plasma meaning they are normally mixed evenly throughout the plasma.

Plasma (55%)

White Blood Cells and Platelets (> 1%)
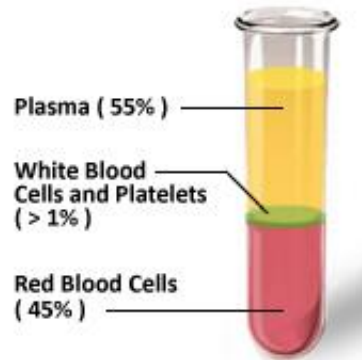
Red Blood Cells (45%)

Artery	Blood vessel that carries blood away from the heart.
Blood	A tissue consisting of red blood cells, white blood cells, plasma and platelets,
Blood vessel	How blood is transported around the body.
Capillary	Blood vessel that connects arteries and veins.
Plasma	Liquid in which other blood components are suspended,
Platelets	Cells that cause wounds to clot.
Red blood cells	Cells that carry oxygen around the body
Vein	Blood vessel that carries blood towards the heart.
White blood cells	Cells that fight microorganisms in the body

Red Blood Cells

These are disc shaped and biconcave. This increases their surface area. They can absorb and more oxygen. Red blood cells don't have a nucleus to make more room for haemoglobin.

White Blood Cells

There are different types but they are part of the immune system and fight communicable disease. They all have large nuclei, and can also change shape so they can **engulf** microorganisms

Blood Vessels

There are three types of blood vessel; arteries, veins and capillaries

Arteries

These carry blood at high pressure AWAY from the heart. They have a thick elastic wall

Veins

These carry blood at lower pressure back to the heart. They have a much thinner wall. They also contain valves to prevent backflow of the blood.

Capillaries

These are where exchange takes place so the wall are only one cell thick. They connect the arteries and the veins.

Plasma

This makes up most of the blood. It is mostly made of water, but with substances like glucose, proteins, ions and carbon dioxide dissolved in it. The other components are suspended in the plasma.

Red blood cell
Platelet
White blood cell
PLASMA
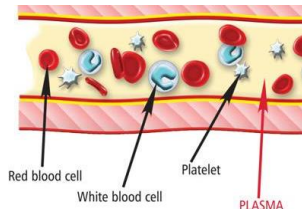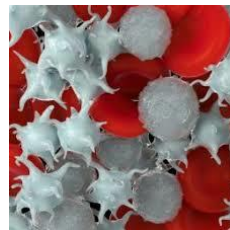
Platelets

Platelets are *fragments* of cells. Their function is to start the process of **clotting** at a wound. The clot blocks the injury until proper healing can happen, preventing excessive blood loss.

Venule
Valve
Vein
Artery
Blood from the Heart
Capillary
Vein
Blood to the Heart

Biology: The Heart Knowledge Organiser

The Heart

The heart is an organ whose role is to pump blood around the body.

In humans the heart is pat o a double circulatory system. This means the blood passes through the heart twice on its journey around the body,

The right side pumps blood to the heart where gas exchange takes place, the blood is deoxygenated.

The left side pumps blood to the rest of the body.
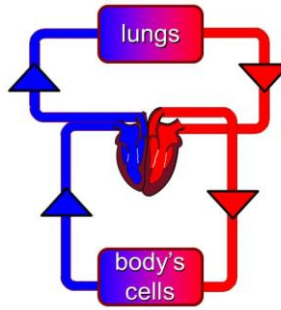
The Structure of the Heart
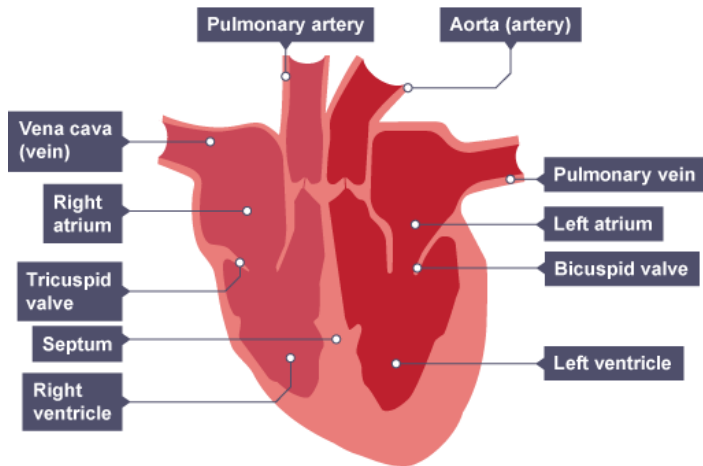
When the heart 'beats' the muscles contract to pump the blood.
Heart rate is controlled by a group of cells in the right atrium that act as a pacemaker. These cells set off the impulses that make the heart muscle contract.
Artificial pacemakers are electrical devices used to correct any irregularities in the heart rate.

Aorta	The artery leaving the left ventricle.
Artery	Blood vessel that carries blood away from the heart.
Atria	Smaller top chambers of the heart.
Blood vessel	How blood is transported around the body.
Capillary	Blood vessel that connects arteries and veins.
Coronary blood vessel	The heart muscle needs its own blood supply. This comes from branches from the aorta as soon as it leaves the heart called **coronary** arteries.
Pulmonary artery	The blood vessel leaving the right ventricle, carrying blood to the lungs.
Pulmonary vein	Vein leading from the lungs back to the heart (to the left atrium).
Valves	Prevent back flow of blood. Allows blood to only flow the correct way.
Vein	Blood vessel that carries blood towards the heart.
Vena cava	The major vein transporting blood from the whole body back to the heart (to the right atrium)
Ventricle	The larger bottom chambers in the heart.

The Lungs

The lungs are adapted for efficient gas exchange. The alveoli have a large surface area, capillaries around the alveoli lead to a good blood supply, concentration gradient to allow a short diffusion pathway.

52
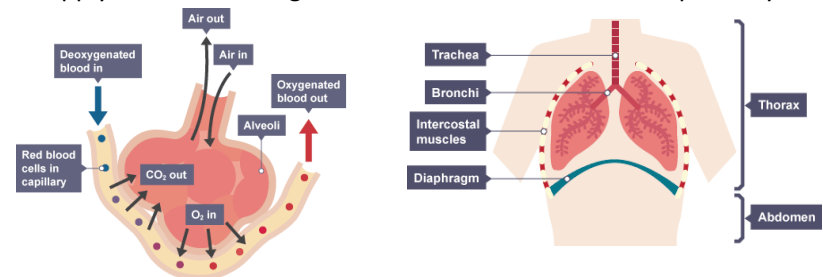
Biology: Plant Systems Knowledge Organiser
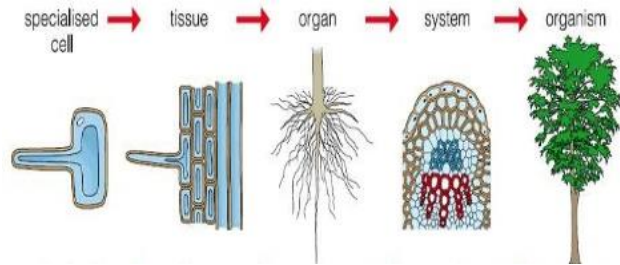
Plants, like humans, are made of cells, tissues, organs and organ systems.

The Leaf

Epidermis	Transparent to allow sunlight to pass through
Palisade layer	Packed with chloroplasts to allow photosynthesis
Mesophyll layer	Air spaces to allow the diffusion of gases
Stoma	Gaps on the underside of the leaf to allow gases in and out of the leaf
Guard cells	Allow stomata to open and close
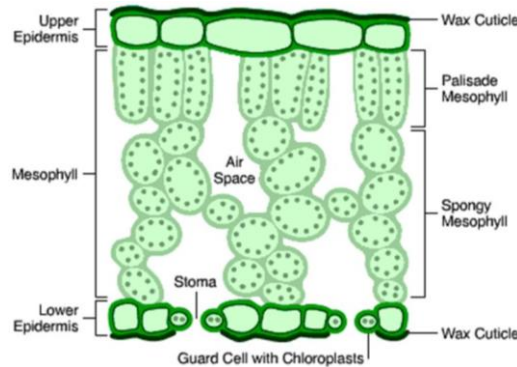
Transport

Root hair cells absorb water by osmosis. They absorb minerals by diffusion and active transport.
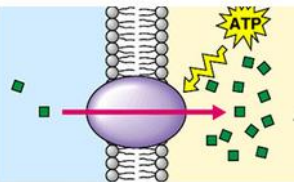
Active transport works against the concentration gradient (from low to high) and requires energy.

Xylem and Phloem

Xylem is made from hollow tubes made from cell walls of dead cells and strengthened by lignin.

Phloem is made of living cells elongated and stacked to form tubes.

Active transport	Movement of particles against a concentration gradient
Diffusion	Movement of particles from high concentration to low concentration
Organ	A group of different tissues working together to perform a particular function
Organ system	Group of organs working together to perform a function
Phloem	Tissue which transports dissolved sugars a plant
Tissue	Group of similar cells working together to perform a function
Translocation	Movement of dissolved sugars around a plant
Transpiration	Movement of water through a plant
Vascular bundle	Strand containing the xylem and phloem
Xylem	Tissue which transports water and minerals around the plant

Translocation

Phloem transports dissolved sugars from the leaves to other parts of the plant in a process called translocation. Cell sap is able to flow from one phloem cell to the next through pores at the end of each wall.
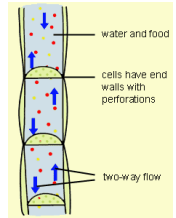
Transpiration

Plants absorb water through the roots. It is transported against gravity from roots to leaves. This is called transpiration. Plants are constantly losing water as vapour through the leaves.

Transpiration can be increased by:
- Brighter light (increases photosynthesis)
- Increased temperature (diffuse faster)
- Increased air (windier so changes concentrat gradient as water is blown away)
- Decreased humidity (steeper concentration gradient)
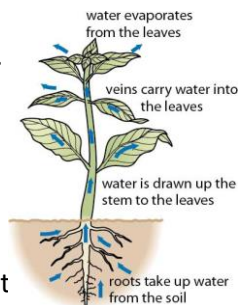
53

Conservation of Mass

No atoms can be created or made during a chemical reaction, so the mass of the reactants will equal the mass of the product.

Reactions can be shown as a word or symbol equation.

magnesium + oxygen → magnesium oxide

Mg + O → MgO
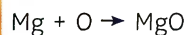
Symbol equations should also be balanced; they should have the same number of atoms on each side.

$2Mg + O_2$ → $2MgO$
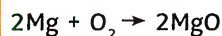
Relative Formula Mass

The relative formula mass (M_r) is the sum of all the relative atomic masses (A_r) of the atoms in the formula.

Examples:

HCl

A_r of H = 1

A_r of Cl = 35.5

M_r of HCl = 1 + 35.5 = 36.5

H_2SO_4

A_r of H = 1

A_r of S = 32

A_r of O = 16

M_r of H_2SO_4 = (1 × 2) + 32 + (16 × 4)

M_r of H_2SO_4 = 2 + 32 + 64

M_r of H_2SO_4 = 98

Calculating Percentage Mass of an Element in a Compound

percentage mass of an element in a compound =

$$A_r \times \frac{\text{number of atoms of that element}}{M_r \text{ of the compound}}$$

Find the percentage mass of oxygen in magnesium oxide.

A_r of magnesium = 24 A_r of oxygen = 16

M_r of MgO = 24 + 16

= 40

% mass = $\frac{A_r}{M_r}$ = $\frac{16}{40}$ = 0.4   0.4 × 100 = 40%

Conservation of Mass

Show that mass is conserved in a reaction.

$2Mg + O_2$ → $2MgO$

(2 × 24) + (2 × 16) → 2(24 + 16)

48 + 32 → 2 × 40

80 → 80
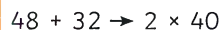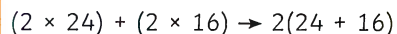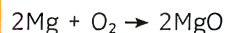
Total M_r on the left-hand side of the equation is the same as the M_r on the right-hand side.

Calculate the mass of the product.
6g of magnesium reacts with 4g of oxygen:
6 + 4 = 10g of magnesium oxide
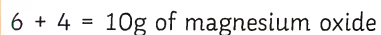
During a reaction the mass can change. If one of the reactants is a gas, the mass can go up.

E.g.

magnesium + oxygen → magnesium oxide

Oxygen from the air is added to the magnesium (making the product) which will be heavier in mass.
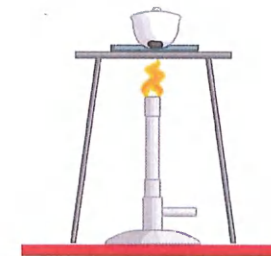
If one of the products is a gas, the mass can go down.

E.g.

sodium carbonate → sodium oxide + carbon dioxide

When sodium carbonate is thermally decomposed, carbon dioxide gas is produced and released into the atmosphere.
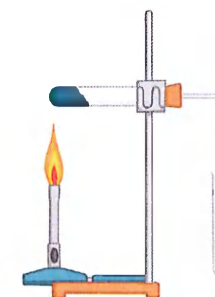
Concentration of Solutions

Concentration is the amount of a substance in a specific volume of a solution. The more substance that is dissolved, then the more concentrated the solution is.

It is possible to calculate the concentration of a solution with the following equation:

concentration (g/dm³) = mass (g) ÷ volume of solvent (dm³)

The equation can be rearranged to find the mass of the dissolved substance:

mass (g) = concentration (g/dm³) × volume (dm³)

The Mole

The Avogadro constant, 6.02×10^{23}, is the number of molecules of a substance that make up one mole of that substance.

Iron has an A_r of 56, so 1 mole of iron has a mass of 56g.

Oxygen (O_2) gas has an M_r of 32, so 1 mole of oxygen has a mass of 32g.

Ammonia (NH_3) has an M_r of 17, so 1 mole of ammonia has a mass of 17g.

$$\text{number of moles} = \frac{\text{mass in g (of an element or compound)}}{M_r \text{ (of the element or compound)}}$$

Moles and Equations

Write a balanced symbol equation for the reaction in which 5.6g of iron reacts with 10.65g of chlorine to form iron chloride.

Work out the M_r of all the substances.

A_r of Fe = 56 and A_r of Cl = 35.5

Divide the mass of each substance by its M_r to calculate how many moles of each substance reacted or produced.

moles Fe = 5.6/56 = 0.1

moles Cl = 10.65/35.5 = 0.3

Divide by the smallest number of moles

Fe = $\frac{0.1}{0.1}$ = 1   Cl = $\frac{0.3}{0.1}$ = 3

Write down the balanced symbol equation.

Fe + 3Cl

Chlorine exists as Cl_2 so the whole thing must be multiplied by 2.

$2Fe + 3Cl_2 \rightarrow 2FeCl_3$
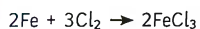
Limiting Reactions

If one reactant gets used up in a reaction before the other, then the reaction will stop. The reactant that has been used up is limiting.

If you halve the amount of reactant then the amount of product will also be halved.

AQA GCSE Chemistry (Combined Science) Unit 4: Chemical Changes Knowledge Organiser

The Reactivity Series

Here's a mnemonic to help you learn the order:

purple (potassium)

slime (sodium)

can (calcium)

make (magnesium)

a (aluminium)

careless (carbon)   carbon ⟶

zebra (zinc)

insane (iron)

try (tin)

learning (lead)   hydrogen ⟶

how (hydrogen)

camels (copper)

surprise (silver)

gorillas (gold)

potassium
sodium
calcium
magnesium
aluminium
zinc
iron
tin
lead
copper
silver
gold
platinum

The reactivity series is a league table for metals. The more reactive metals are near the top of the table with the least reactive near the bottom. In chemical reactions, a more reactive metal will displace a less reactive metal.

Reactions of Metals with Water

Metals, when reacted with water, produce a metal hydroxide and hydrogen.

lithium + water ⟶ lithium hydroxide + hydrogen

$2Li + 2H_2O \longrightarrow 2LiOH + H_2$

The more reactive a metal is, the faster the reaction.

Reactions of Metals with Dilute Acid

Metals, when reacted with acids, produce a salt and hydrogen.

Sodium + hydrochloric acid ⟶ sodium chloride + hydrogen

$2Na + 2HCl \longrightarrow 2NaCl + H_2$

Metals that are below hydrogen in the reactivity series **do not** react with dilute acids.

Reactions of Acids

The general formula for the reaction between an acid and a metal is:
acid + metal ⟶ salt + hydrogen

For example: hydrochloric acid + sodium ⟶ sodium chloride + hydrogen

$2HCl + 2Na \longrightarrow 2NaCl + H_2$

When an acid reacts with an alkali, a neutralisation reaction takes place and a salt and water are produced.

The general formula for this kind of reaction is as follows:

acid + alkali ⟶ salt + water

hydrochloric acid + sodium hydroxide ⟶ sodium chloride + water

$HCl + NaOH \longrightarrow NaCl + H_2O$

Naming Salts

The first part comes from the metal in the metal carbonate, oxide or hydroxide. The second part of the name comes from the acid that was used to make it.

For example, sodium chloride.

Acid Used	Salt Produced
hydrochloric	chloride
nitric	nitrate
sulfuric	sulfate

Redox Reactions (Higher Tier Only)

When metals react with acids, they undergo a redox reaction. A **redox reaction** occurs when both **oxidation** and **reduction** take place at the **same time**.

For example:

$2H^+ + Ca \longrightarrow Ca^{2+} + H_2$

The ionic equation can be further split into two half equations.

$Ca \longrightarrow Ca^{2+} + 2e^-$

Oxidation is loss of electrons.

$2H^+ + 2e^- \longrightarrow H_2$

Reduction is gaining of electrons.

Reactions with Bases

The general formula for the reaction between an acid and a metal oxide is:
acid + metal oxide ⟶ salt + water

sulfuric acid + copper oxide ⟶ copper sulfate + water

$H_2SO_4 + CuO \longrightarrow CuSO_4 + H_2O$
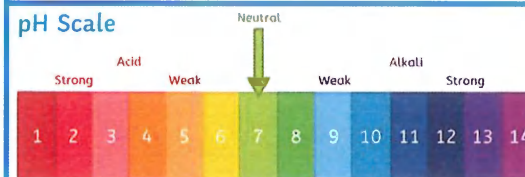
Reactions with Carbonates

The general formula for the reaction between an acid and a carbonate is:
acid + carbonate ⟶ salt + water + carbon dioxide

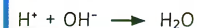hydrochloric acid + calcium carbonate ⟶ calcium chloride + water + carbon dioxide

pH Scale



In aqueous solutions, acids produce H^+ ions and alkalis produce OH^- ions. Neutral solutions are pH7 and are neither acids or alkalis.

For example, in neutralisation reactions, hydrogen ions from an acid react with hydroxide ions from an alkali to produce water:

$H^+ + OH^- \longrightarrow H_2O$

Making Soluble Salts

1. Make a saturated solution by stirring copper oxide into the sulfuric acid until no more will dissolve.
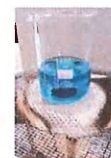
2. Filter the solution to remove the excess copper oxide solid.

3. Half fill a beaker with water and set this over a Bunsen burner to heat the water. Place an evaporating dish on top of the beaker.

4. Add some of the solution to the evaporating basin and heat until crystals begin to form.

5. Once cooled, pour the remaining liquid into a crystallising dish and leave to cool for 24 hours.
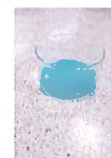
6. Remove the crystals with a spatula and pat dry between paper towels.

56

Strong and Weak Acids (Higher Tier Only)

A **strong** acid **completely dissociates** in a solution.

For example: $HCl \longrightarrow H^+ + Cl^-$

Hydrochloric acid is able to completely dissociate in solution to form hydrogen and chloride ions.

Examples of strong acids include nitric acid (HNO_3) and sulfuric acid (H_2SO_4).

Weak acids in comparison only partially dissociate.

For example acetic acid **partially dissociates** to form a hydrogen and acetate ion.

$CH_3COOH \rightleftharpoons CH_3COO^- + H^+$
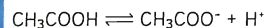
The **double arrow** symbol indicates that the reaction is **reversible**. Both the forward and reverse reaction occur at the same time and the reaction never goes to completion.

The Process of Electrolysis

Electrolysis is the **splitting up** of an ionic substance using **electricity**.

On setting up an electrical circuit for electrolysis, two **electrodes** are required to be placed in the electrolyte. The electrodes are **conducting rods**. One of the rods is connected to the **positive** terminal and the other to the **negative** terminal.

The **electrodes** are **inert** (this means they do not react in the reaction) and are often made from **graphite** or platinum.

During the process of electrolysis, **opposites attract**. The positively charged ions will be attracted toward the negative electrode. The negatively charged ions will be attracted towards the positive electrode.

When ions reach the electrodes, the charges are lost and they become elements.

The **positive** electrode is called the **anode**.

The **negative** electrode is called the **cathode**.

Electrolysis of Aqueous Solutions
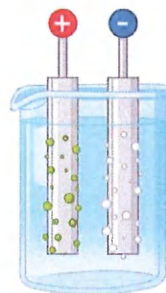
Gases may be given off or metals deposited at the electrodes. This is dependent on the reactivity of the elements involved.

If the metal is **more reactive** than **hydrogen** in the reactivity series, then **hydrogen** will be **produced** at the **negative cathode**. At the **positive anode**, negatively charged ions **lose** electrons. This is called **oxidation** and you say that the ions have been oxidised.

## Using Electrolysis to Extract Metals

Metals are extracted by electrolysis if the metal in question reacts with carbon or if it is too reactive to be extracted by reduction with carbon. During the extraction process, large quantities of energy are used to melt the compounds.

Aluminium is manufactured by the process of electrolysis. Aluminium oxide has a high melting point and melting it would use large amounts of energy. This would increase the cost of the process, therefore molten **cryolite** is added to aluminium oxide to lower the melting point and thus reduce the cost.

Electrolysis of Molten Ionic Compounds – Lead Bromide

Lead bromide is an **ionic** substance. Ionic substances, when solid, are **not** able to conduct electricity. When molten or in solution, the ions are free to move and are able to carry a charge.
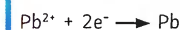
The **positive** lead ions are attracted toward the **negative cathode** at the same time as the **negative bromide** ions are attracted toward the **positive anode**.
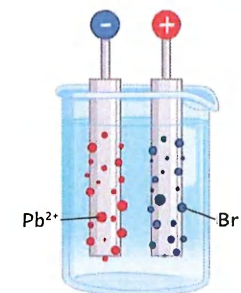
Oxidation is the loss of electrons and reduction is the gaining of electrons. **OIL RIG** (Higher Tier Only).

We represent what is happening at the electrodes by using **half equations** (Higher Tier Only).

The lead ions are attracted towards the negative electrode. When the **lead ions** (Pb^{2+}) reach the cathode, each ion **gains two electrons** and becomes a neutral atom. We say that the lead ions have been **reduced**.

$Pb^{2+} + 2e^- \longrightarrow Pb$

The bromide ions are attracted towards the positive electrode. When the **bromide ions** (Br-) reach the anode, each ion **loses one electron** to become a neutral atom. Two bromine atoms are then able to bond together to form the covalent molecule Br_2.
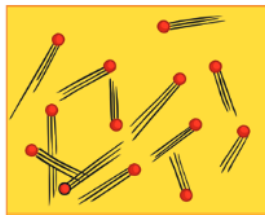
$2Br^- \longrightarrow Br_2 + 2e^-$

Internal Energy

Particles within a system have kinetic energy when they vibrate or move around. The particles also have a potential energy store. The total internal energy of a system is the kinetic and potential energy stores.
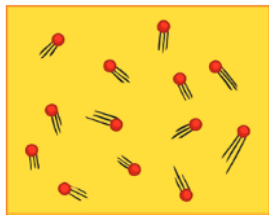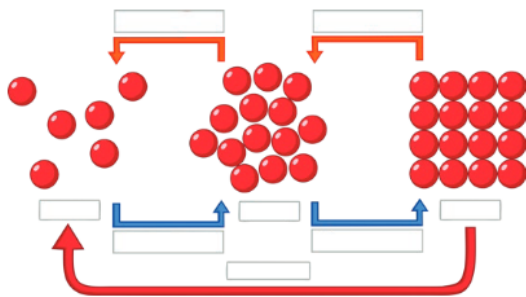

Low Temperature   **High Temperature**

If the system is heated, the particles will gain more kinetic energy, so increasing the internal energy.

Changing State

If a system gains more energy, it can lead to a change in temperature or change in state. If the system is heated enough, then there will be enough energy to break bonds.

When something changes state, there is no chemical change, only physical. No new substance is formed. The substance will change back to its original form. The number of particles does not change and mass is conserved.

Specific Latent Heat

Energy is being put in during melting and boiling. This increases the amount of internal energy. The energy is being used to break the bonds, so the temperature does not increase. This is shown by the parts of the graph that are flat.
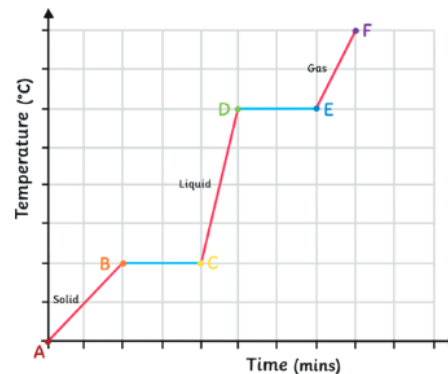
When a substance is condensing or freezing, the energy put in is used to form the bonds. This releases energy. The internal energy decreases, but the temperature does not go down.
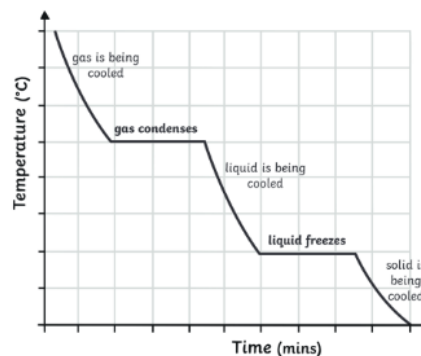
The energy needed to change the state of a substance is called the latent heat.

Specific latent heat is the amount of energy needed to change 1kg of a substance from one state to another without changing the temperature. Specific latent heat will be different for different materials.

- solid ⟶ liquid - specific latent heat of **fusion**

- liquid ⟶ gas - specific latent heat of **vaporisation**

Specific Latent Heat Equation

The amount of energy needed/released when a substance of mass changes state.
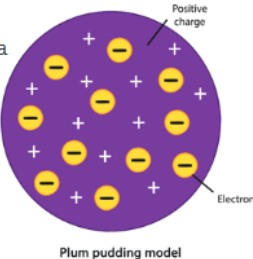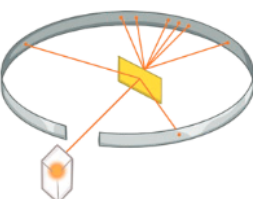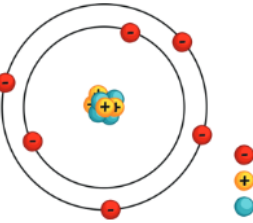
energy (E) = mass (m) × specific latent heat (L)

$E = mL$

Atomic Structure Knowledge Organiser – Foundation and Higher

Developing the Model of the Atom

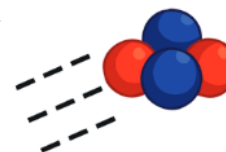| Scientist	Time	Contribution
John Dalton	Start of 19th century	Atoms were first described as solid spheres.
JJ Thomson	1897	Thomson suggested the plum pudding model – the atom is a ball of charge with electrons scattered within it.
Ernest Rutherford	1909	Alpha Scattering experiment – Rutherford discovered that the mass is concentrated at the centre and the nucleus is charged. Most of the mass is in the nucleus. Most atoms are empty space.
Niels Bohr	Around 1911	Bohr theorised that the electrons were in shells orbiting the nucleus.
James Chadwick	Around 1940	Chadwick discovered neutrons in the nucleus.

Isotopes

An isotope is an element with the same number of protons but a different number of neutrons. They have the same atomic number, but different mass numbers.

Isotope	Protons	Electrons	Neutrons
$^{1}_{1}H$	1	1	0
$^{2}_{1}H$	1	1	1
$^{3}_{1}H$	1	1	2

Some isotopes are unstable and, as a result, decay and give out radiation. Ionising radiation is radiation that can knock electrons off atoms. Just how ionising this radiation is, depends on how readily it can do that.

Beta

Beta radiation is a fast moving electron that can be stopped by a piece of aluminium. Beta radiation is emitted by an atom when a neutron splits into a proton and an electron.

$^{0}_{-1}e$

α α = Alpha

β β = Beta

γ γ = Gamma
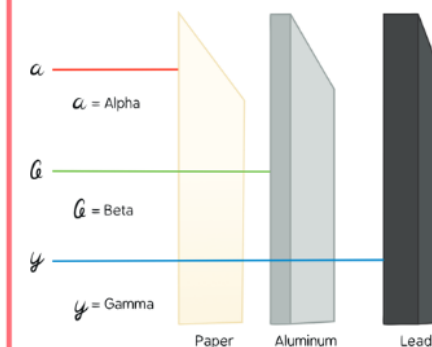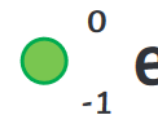
Paper   Aluminum   Lead

Alpha

Alpha radiation is an alpha particle emitted from the nucleus of a radioactive nuclei. It is made from two protons and two neutrons. They can't travel too far in the air and are the least penetrating – stopped by skin and paper. However, they are highly ionising because of their size.

Gamma

A gamma wave is a wave of radiation and is the most penetrating – stopped by thick lead and concrete.
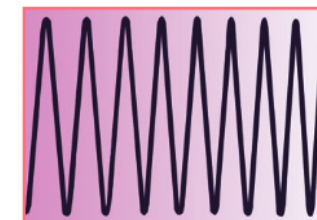
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Half-life

The half-life is the time taken for the number of radioactive nuclei in an isotope to halve.

Radioactivity is a random process – you will not know which nuclei will decay.

Radioactive decay is measured in becquerels Bq. 1 Bq is one decay per second.

Radioactive substances give out radiation from their nucleus.

A graph of half-life can be used to calculate the half-life of a material and will always have this shape:
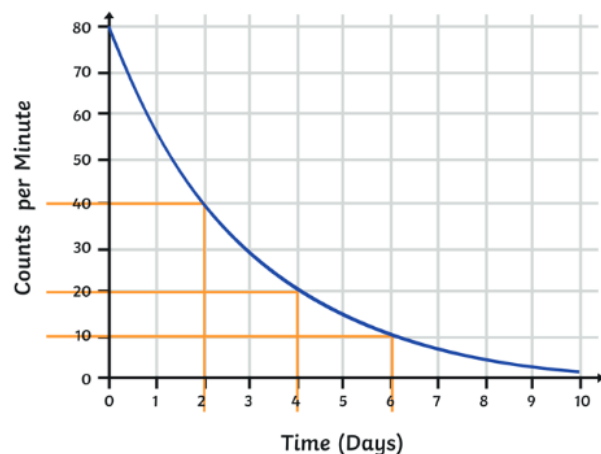
Judging from the graph, the radioactive material has a half-life of two days.

Irradiation

Irradiation occurs when materials are near a radioactive source. The source is sometimes placed inside a lead-lined box to avoid this.

People who work with radioactive sources will sometimes stand behind a lead barrier, be in a different room or use a remote-controlled arm when handling radioactive substances.
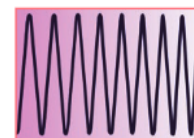
Alpha Decay Equations

An alpha particle is made of two protons and two neutrons. The atomic number goes down by two and its mass number decreases by four.

$$^{226}_{88}Ra \qquad ^{222}_{86}Rn \qquad ^{4}_{2}He$$
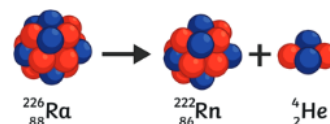
Gamma rays

There is no change to the nucleus when a radioactive source emits gamma radiation. It is the nucleus getting rid of excess energy.


Contamination

When unwanted radioactive atoms get onto an object, it is possible for the radioactive particles to get inside the body.

Protective clothing should be worn when handling radioactive material.

Beta Decay Equations

A neutron turns into a proton and releases a an electron. The mass of the nucleus does not change but the number of protons increases.

$$^{8}_{3}Li \qquad ^{8}_{4}Be \qquad ^{0}_{-1}e$$
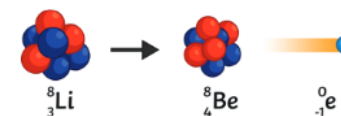
Alpha radiation is more dangerous inside the body. It is highly ionising and able to cause a lot of damage. Outside the body it is less dangerous because it cannot penetrate the skin.

Beta radiation is less dangerous inside the body as some of the radiation is able to escape. Outside the body it is more dangerous as it can penetrate the skin.

Gamma radiation is the least dangerous inside the body as most will pass out and it is the least ionising. Gamma is more dangerous outside the body as it can penetrate the skin.