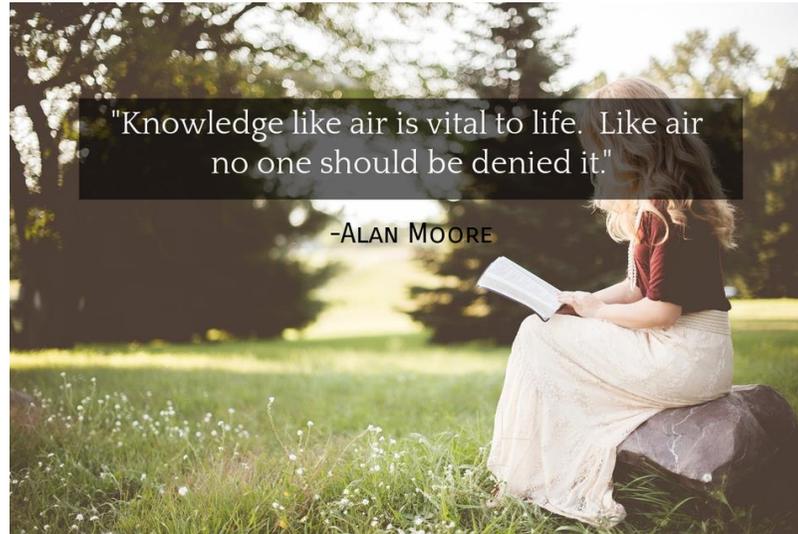




Dorset
Studio School
CENTRE OF EXCELLENCE FOR
ENVIRONMENTAL SCIENCES

Knowledge Organiser Booklet

Year 7 Summer Half Term 1



Name: _____

Tutor group: _____

Contents

- Home learning timetable
- Instructions on how to use a knowledge organiser
- English
- Maths
- Science
- Humanities
- Land & Environment
- Art
- Music
- MFL
- ICT



Education
Endowment
Foundation

+5
months

Research carried out by the Education Endowment Foundation proved that: Homework has a positive impact on average of + 5 months, particularly with pupils in secondary schools.

Home learning timetable

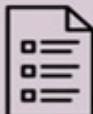
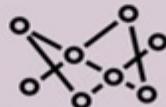
The table below details which days each subject will set home learning on each week. Students will have one week to complete home learning tasks for each subject.

Group	Monday	Tuesday	Wednesday	Thursday	Friday
7N	Humanities Art	Science MFL	Maths Science	English Music	Reading
7E	MFL Science	Art Humanities	Maths Science	English	Music Reading
7W	MFL	Science Art	Maths Humanities	English Science	Music Reading

Please note you have two science teachers; science home learning will be set by both teachers

These knowledge organisers have been created by your teachers to support your learning both in class and for home learning. They are also a valuable revision tool for you to use independently when preparing for assessments. It is important that you make good use of your knowledge organisers by learning how to use them in different ways.

How to use a knowledge organiser – step by step guide

	Look, Cover, Write, Check	Definitions of Key Words	Flash Cards	Self Quizzing	Mind Maps	Paired Retrieval
Step 1	<p>Look at and study a specific area of your KO.</p> 	<p>Write down the key words and definitions.</p> 	<p>Use your KO to condense and write down key facts or information onto flash cards.</p> 	<p>Use your KO to create a mini quiz. Write down your questions using your KO.</p> 	<p>Create a mind map with all the information you can remember from your KO.</p> 	<p>Ask a friend or family member to have the KO or flash cards in their hands.</p> 
Step 2	<p>Cover or flip the KO over and write down everything you can remember.</p> 	<p>Try not to use your KO to help you.</p> 	<p>Add pictures to help support. Then self-quiz using the flash cards. You could write questions on one side, and answers on the other!</p> 	<p>Answer the questions and remember to use full sentences.</p> 	<p>Check your KO to see if there are any mistakes on your mind map.</p> 	<p>They can test you by asking you questions on different sections of your KO.</p> 
Step 3	<p>Check what you have written down. Correct any mistakes in green pen and add anything you have missed. Repeat.</p> 	<p>Use your green pen to check your work.</p> 	<p>Ask a friend or family member to quiz you on the knowledge.</p> 	<p>Ask a friend or family member to quiz you using the questions.</p> 	<p>Try to make connections, linking the information together.</p> 	<p>Write down your answers,</p> 



5.1 Key Vocabulary

Allusion	An expression designed to call something to mind without mentioning it explicitly; an indirect or passing reference.
Explanation	A statement, fact, or situation that tells you why something happened; a reason given for something.
Developing	Develop (something) means to start to have a skill, ability, quality, etc. that becomes better and stronger; to become better and stronger.
Exploration	the deliberate process of making an examination of something in order to find out about it.
Enunciate	to say or pronounce words clearly in order to clarify and explain the meaning or reasons behind them.
Clarify	to make something clearer or easier to understand through the process of using language accurately.
Contrasting	elements of an argument that are of a very different in style, colour or attitude to others; creating a deliberate difference.
Similarly	used within persuasive writing to show that two facts, actions, statements, etc. are like each other.
Ultimately	used within an argument or persuasive text to show the final stage of the process of argument or persuasion (in the end; finally; to conclude).

5.2 Key Quotations

Quotation	Meaning
<i>"I ought to be thy Adam, but I am rather the fallen angel..."</i>	Biblical allusion – the monster heaps responsibility for his evil actions upon Victor, scolding him for his neglectful failure to provide a nourishing environment.
<i>"Did I request thee, Maker, from my clay."</i>	The monster sees himself as a tragic figure, comparing himself to both Adam and Satan. Like Adam, he is shunned by his creator, though he strives to be good.
<i>"I began the creation of a human being... bless me as its creator"</i>	Frankenstein's arrogance is clear as he plays God in creating a version of human life. "Bless me" is a religious phrase and ironic, since he, himself, is acting as God.
<i>"wretch – the miserable monster whom I had created."</i>	Frankenstein realises the error that he has made in trying to create life. He feels an odd combination of pride and guilt.
<i>"... watching its progress with curiosity and delight."</i>	Frankenstein is scientifically fascinated in his own powers of creation and pleased with his own skill as creator.
<i>"Like the archangel who aspired to omnipotence..."</i>	Frankenstein compares himself to Satan, the character who tried to become powerful like God and was condemned for doing so.

5.3 – Structuring Arguments

Point	Evidence	Explain	Link
The writer uses...	We see this when...	This... suggests	A reader in the Romantic era might respond to this by...
The writer gives the impression that...	...in the line "___"	implies	
We can clearly see...	When X says "___"...	highlights	Due to the age of Enlightenment, readers at the time saw religion as...
		illustrates	
		portrays	
		conveys the idea	
		contrasts with	



Point **E**vidence **E**xplain **L**ink

PARAGRAPH STRUCTURE



5.4 Context / Cultural Capital

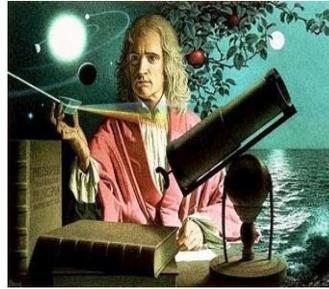
1500

1851

A. Scientific Revolution: 1543-1687

The Scientific Revolution was a series of events that marked the emergence of modern science during the early modern period, when developments in mathematics, physics, astronomy, biology, and chemistry transformed the views of society about nature.

Sir Isaac

**B. Mary Shelley: 1797-1851**

Mary was an English novelist who, at 18-years-old, wrote the Gothic novel *Frankenstein; or, The Modern Prometheus*, which is considered an early example of science fiction and one of her best-known works.

**F. Fact:**

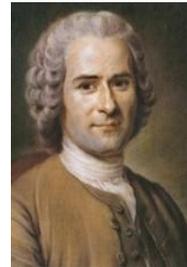
The term *Romanticism* does not stem directly from the concept of love, but rather from the French word *romant* (a romantic story told in verse). It refers to an artistic style emphasizing imagination and emotion, and the suffix *-ism*, expresses a thought process or movement.

G. Shelley was inspired by the concept of **galvanism** - the idea that scientists could use electricity to stimulate or restart life. Named after Luigi Galvani, an Italian doctor, the concept came about after Galvani was able to make a frog's legs twitch when he hooked the animal up to an electric charge (above image).

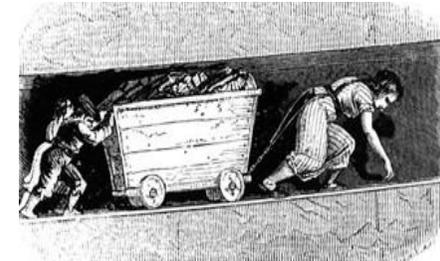
Galvani's nephew, Giovanni Aldini, went so far as to shock dissected human corpses in pursuit of this hypothesis. In Shelley's 1831 introduction text, she states she overheard many discussions about the topic between her husband Percy Shelley and her friend Lord Byron. Since this was a newly discovered effect, she and many believed it to be possible to reanimate dead organisms through the use of electricity.

C. Enlightenment: 1685-1840

A European intellectual and philosophical movement of the late 17th and 18th centuries emphasizing reason and individualism rather than tradition. This movement stressed the belief that science and logic give people more knowledge and understanding than tradition and religion. Some of the major figures of the Enlightenment included John Locke, Voltaire, and Jean-Jacques Rousseau (pictured) - who is considered the father of both the Romantic Movement and the French Revolution.

**D. Industrial Revolution: 1750-1840**

The Industrial Revolution was a period of major mechanization and innovation that began in Great Britain and later spread throughout much of the world. It was dominated by the exploitation of coal and iron. Child labour was a common feature of the Industrial Revolution and involved children suffering under horrible and abusive conditions.

**E. Romanticism: 1798-1837**

Romanticism was an artistic and intellectual movement that emphasized nature and the importance of emotion and artistic freedom. In many ways, writers of this era were rebelling against the attempt to explain the world and human nature through science and the lens of the Industrial Revolution.



Frankenstein or The Modern Prometheus was published anonymously in 1818



Using Language Effectively

Alliteration	the same letter or sound repeated in a text to create a particular sound
Metaphor	an image or idea used to represent something else
Simile	a comparison using 'like' or 'as'
Personification	applying human qualities to something inanimate
Pathetic fallacy	using the weather to reflect mood / personification of the weather
Sensory imagery	descriptions involving, taste, touch, smell, sight or sound
Juxtaposition	contrast for deliberate effect

Structure and organisation

STRUCTURE:

All forms of writing must use paragraphs correctly. One way to remember this is 'Tip Top'.



Time

PARAGRAPHS

Make them

TIP TOP

For a new

Place Topic
start a new paragraph



Person



Spelling, Punctuation and Grammar

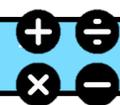
SENTENCES TO IMPRESS

TWO ADJECTIVES Enraged and exasperated...	ADVERB Listlessly,... Stealthily,...	PREPOSITIONS Beyond the abyss... Towards the inferno...
SIMILE As silent as a whisper	-ING SENTENCES Pirouetting in the wind...	LIST OF THREE Tumbling, turning, twisting...
QUESTION WORDS What was my next move?	SINGLE WORDS Silence.	REPETITION Again and again and again...

PUNCTUATION TO IMPRESS

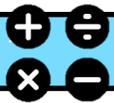
COLON : Parapets, saps, dugouts: damage from the bombardment was everywhere.	SEMI COLON ; The boom resounded sonorously across the valley; we cowered against the wall.
ELLIPSIS ... It was only a matter of time before...	DASH - The thunder – its ally – rumbled alongside.
QUESTION MARK ? Was it about to claim its next victim?	QUOTATION MARKS The sea shrieked, 'You are mine now. All mine.'

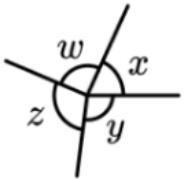
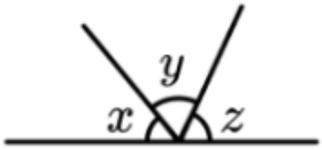
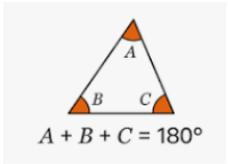
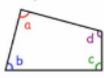




Key Term	Definition	Diagram
Equilateral Triangle	A triangle with all sides the same length and angles of 60° .	
Isosceles Triangle	A triangle with two sides and two base angles of equal size.	
Isosceles Trapezium	A trapezium with two sides of equal length and 2 pairs of equal angles.	
Kite	A quadrilateral with two pairs of equal sides and adjacent sides equal.	
Parallelogram	A quadrilateral with two pairs of parallel sides and opposite sides equal.	

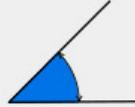
Key Term	Definition	Diagram
Rectangle	A quadrilateral with two pairs of parallel sides and opposite sides of equal length.	
Rhombus	A quadrilateral with four equal sides and two pairs of parallel sides.	
Right-angled Triangle	A triangle, one of whose angles is 90° .	
Scalene Triangle	A triangle, having all sides unequal.	
Square	A regular quadrilateral, having four equal sides and angles.	
Trapezium	A quadrilateral with one pair of parallel sides.	



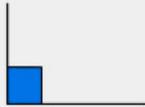
Key terms	Definitions
Angles around a point	<p>Angles around a point sum to 360°.</p>  <p>$w + x + y + z = 360$</p>
Angles on a straight line	<p>Angles on a point on a straight line sum to 180°.</p>  <p>$x + y + z = 180$</p>
Angles in a triangle	<p>Angles in a triangle sum to 180°.</p>  <p>$A + B + C = 180^\circ$</p>
Angles in a quadrilateral	<p>Angles in a quadrilateral sum to 360°.</p>  <p>$a + b + c + d = 360^\circ$</p>

Different types of angle:

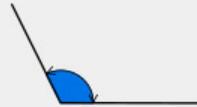
Types of Angles



ACUTE ANGLE
less than 90°



RIGHT ANGLE
exact 90°



OBTUSE ANGLE
greater than 90°
less than 180°



STRAIGHT ANGLE
exact 180°

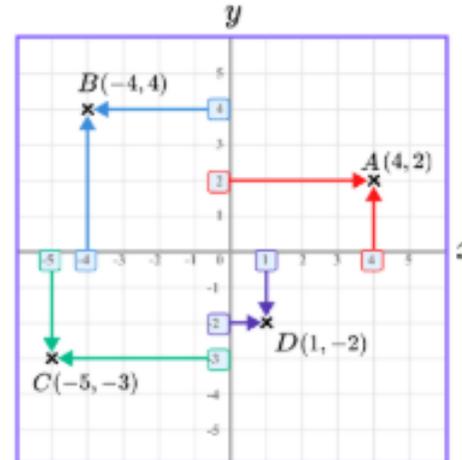


REFLEX ANGLE
greater than 180°
less than 360°

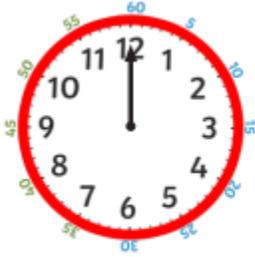
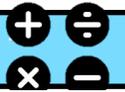


FULL ANGLE
exact 360°

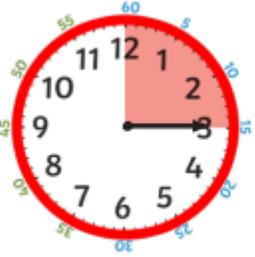
Co-ordinates:



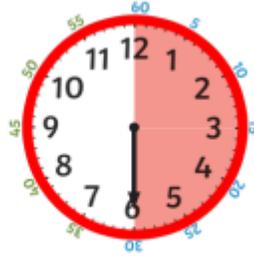
Co-ordinates are plotted in the form (x, y) .
The x axis is horizontal and the y axis is vertical



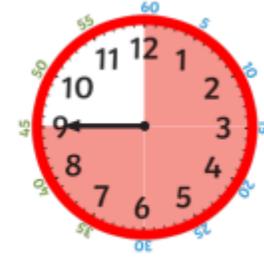
o'clock



quarter past



half past



quarter to

Minutes in an Hour

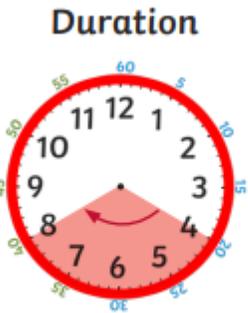
There are 60 minutes in an hour. We can count in 5s around the clock to see the minutes.



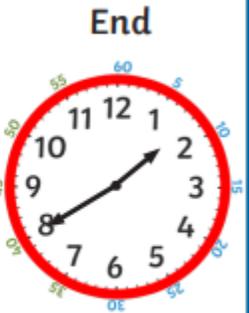
We can use this knowledge to begin telling time to five minutes.



Start



Duration



End

20 minutes has passed.

Converting units of time

To change from seconds to minutes, divide by 60.

To change from minutes to hours, divide by 60.

To change from hours to minutes, multiply by 60.

To change from minutes to seconds, multiply by 60.

e.g. 245 minutes into hours and minutes is

$$245 \div 60 = 4.083333... \text{ hours}$$

So this is 4 whole hours plus some minutes.

$$4 \text{ hours is } 4 \times 60 = 240 \text{ minutes.}$$

$$245 \text{ minutes} - 240 = 5 \text{ minutes.}$$

So 245 minutes is 4 hours and 5 minutes.

Calculating with time

e.g. A television programme starts at 07:10 and finishes at 09:15. How long is it on for?

From 07:10 to 08:00 is 50 minutes. From 08:00 to 09:00 is 1 hour. From 09:00 to 09:15 is 15 minutes.

So in total it is 50 minutes + 1 hour + 15 minutes.

$$50 \text{ minutes} + 15 \text{ minutes} = 65 \text{ minutes} = 1 \text{ hour } 5 \text{ minutes.}$$

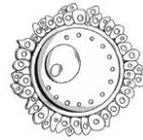
So in total it is 1 hour + 1 hour 5 minutes = 2 hours 5 min.

This is 24hr notation. It is the same as 9:15 am.

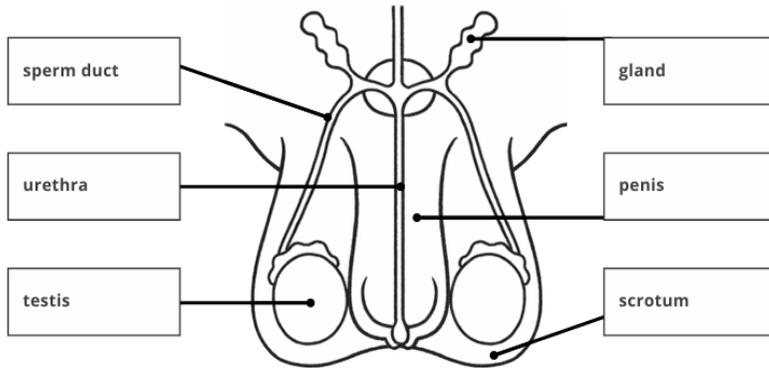




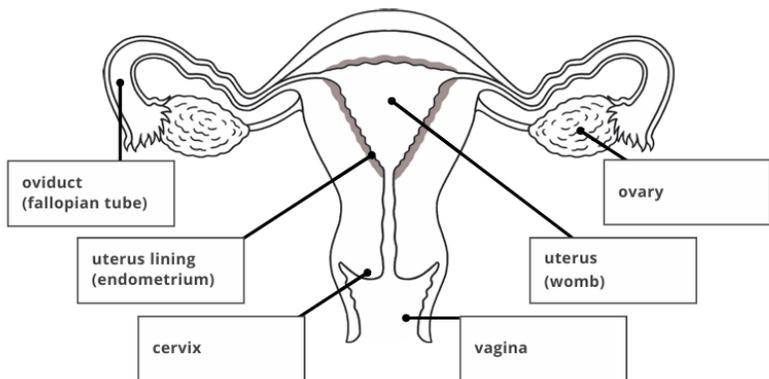
Sperm cells and egg cell



Male reproductive system



Female reproductive system



The **time** during which you change from being a **child** to being an **adult** is called **adolescence**.

The **physical changes** that happen between the ages of 9–14 are called **puberty**.

Girls

breasts develop,
ovaries start to
release egg cells,
periods start,
hips widen

Both

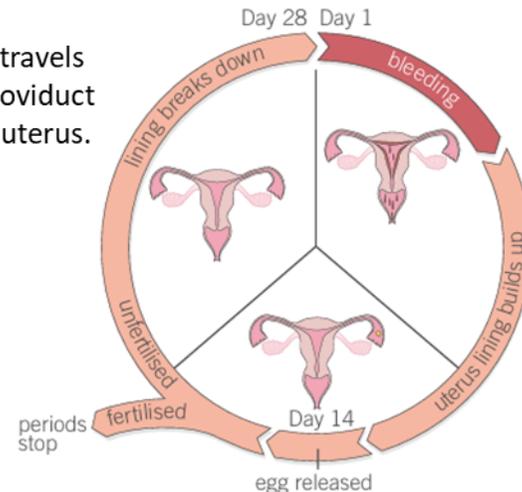
pubic and underarm
hair grows,
body odour
develops,
emotional changes,
growth spurt

Boys

voice breaks,
sexual organs
develop,
testes start to
produce sperm,
shoulders widen,
hair grows on face
and chest

The menstrual cycle

The egg cell travels through the oviduct towards the uterus.

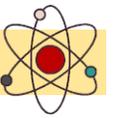


Day 1 – blood from uterus lining leaves the body through the vagina.

Day 5 – bleeding stops. Uterus lining begins to re-grow.

Day 14 – an egg cell is released from one of the ovaries (ovulation).

If a sperm meets the egg fertilisation may happen.



Pollination occurs when **pollen** is transferred from an **anther** to a **stigma**.

Pollination can occur due to **insects** or the **wind**.

cross-pollination = between two different plants

self-pollination = between the male and female parts of the same plant

Fertilisation occurs when the **pollen nucleus** joins with the **ovule nucleus**.

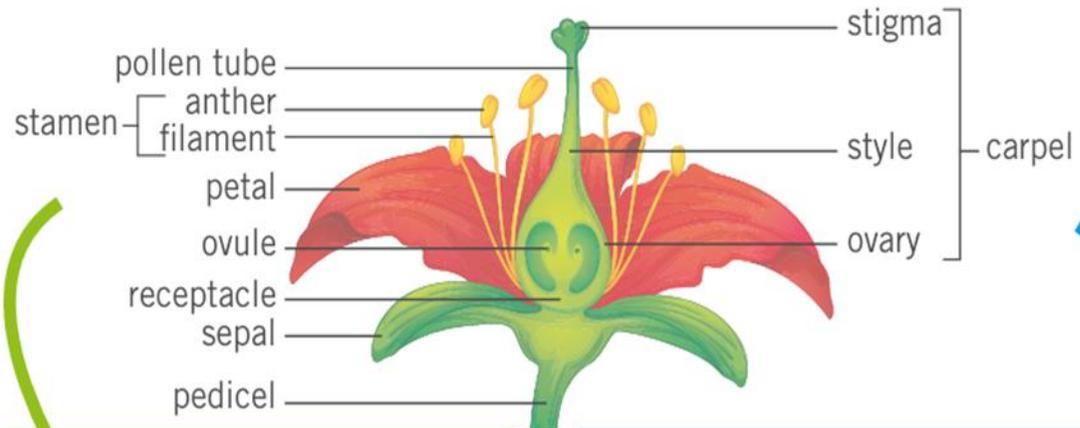
When a seed starts to grow it is called **germination**.

To germinate, seeds need:

- **water** – for the seed to swell and the embryo to start growing
- **oxygen** – for respiration and transferring energy for germination
- **warmth** – to help speed up the reactions in the plant.



Parts of a flower.



Male reproductive system

- the anther produces pollen
- the filament holds up the anther

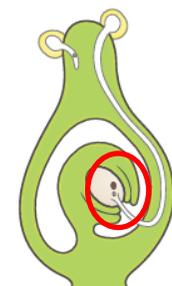
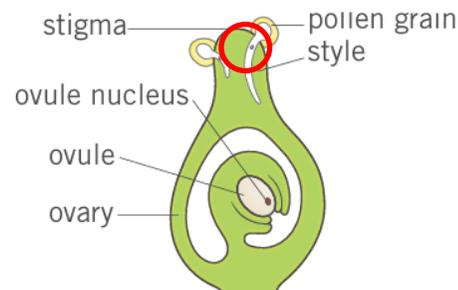
Female reproductive system

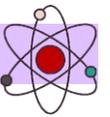
- the stigma is sticky to catch grains of pollen
- the style holds up the stigma
- the ovary contains ovules

The tube grows out of the pollen grain and down through the style.

The pollen nucleus moves down the tube.

The pollen nucleus joins with the ovule nucleus.





Substances with a pH between **0 and 6** are **acidic**.
 Substances closer to pH 0 are more acidic (stronger).
 Substances with a pH of **7** are **neutral**.
 Substances with a pH between **8 and 14** are **alkaline**.
 Substances closer to pH 14 are more alkaline (stronger).

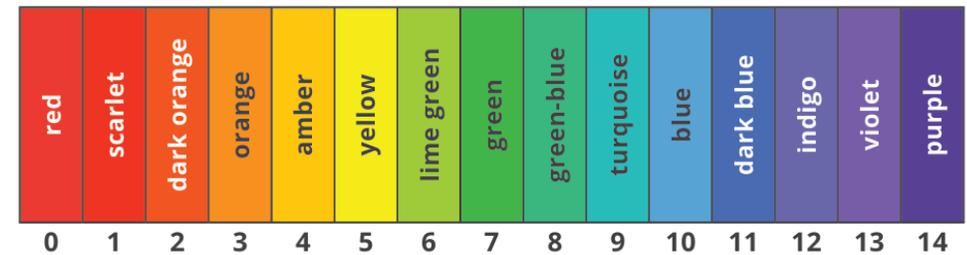
Litmus Indicator

Red litmus paper stays **red** in acidic or neutral solutions and turns **blue** in alkaline solutions.
Blue litmus paper stays **blue** in alkaline or neutral solutions and turns **red** in acidic solutions.

A **base** is a compound that can act react with an **acid** to make a **neutral** solution.

Bases that are soluble in water are **alkalis**.

Universal Indicator



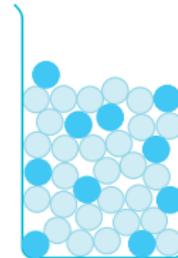
Naming salts - The name of the **metal comes first**, for example, magnesium chloride.

Different acids produce different types of salt:

- hydrochloric acid produces metal chlorides – e.g. sodium chloride
- sulfuric acid produces metal sulfates – e.g. calcium sulfate
- nitric acid produces metal nitrates – e.g. potassium nitrate

Concentrated

– lots of acid/alkali particles for the amount of water.



Dilute – small number of acid/alkali particles for the amount of water.



corrosive

A corrosive substance can react with other substances causing the destruction of materials. It could burn the skin or cause damage to the eyes.



moderate health hazard

This may include irritants. These are substances that may cause redness or blistering if they come into contact with the skin.

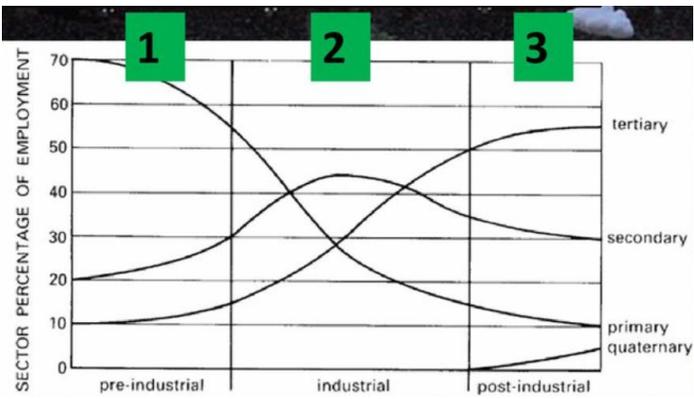


5.1 Job Sectors

5.1.1. Primary Sector	In primary (first) sector jobs, people work with raw materials from the land or sea. Farmers, miners, forestry workers and fishermen and women are in this category.
5.1.2. Secondary Sector	In the secondary (second) sector people take raw materials and turn them in to something else. This process is also known as manufacturing. For example, clothes makers use cotton, wool or leather etc to make clothes.
5.1.3. Tertiary Sector	In the tertiary (third) sector people carry out a service for others. Doctors, cleaners and shop assistants are all examples of tertiary sector workers.
5.1.4. Quaternary Sector	The quaternary (fourth) sector is about highly qualified people using their knowledge. They often create new things and carry out research. They may develop new medicines or new technology e.g. Scientists
5.1.5. Quinary Sector	The quinary (fifth) sector includes high-level decision-making by top officials, leaders, and executives in government, industry, and non-profit organizations. This could be in areas such as health, education, culture, research, police, fire service, and other government industries not intended to make a profit.

5.2 Key Terms

5.2.1. Raw Materials	Basic materials such as; Wood, metal, wheat, cotton and wool. These materials are used to make other things.
5.2.2. Manufacturing	The making of products using raw materials. This usually happens in factories.
5.2.3. Products	Everyday things that people buy and use every day e.g. food, mobile phones and cars etc. They tend to be items that have been manufactured.
5.2.4. Services	A service is the action of helping or doing work for someone. Often people sell their skills and expertise instead of products. Teacher, nurses and doctors all sell their knowledge and skills.
5.2.5. Domestic system	When goods are made in the home on a small scale. This was common in UK before the industrial revolution started around c1750.
5.2.6. Factory System	This is where goods (products) are manufactured on a huge scale in factories to be sold for major profits.
5.2.7. Pre-industrial	Before the industrial revolution began around c1750 in UK.
5.2.8. Post-industrial	After the industrial revolution. This tends to be considered around c1900 in UK.



How Job sectors have changed through time in UK





Understand our coastline and what we can do to preserve it.

Topic Tent Posts:
Cleaning up our
coastline to
enable
biodiversity to
flourish



Key Vocabulary

- Biodiversity
- Invertebrates
- seabirds
- Keystone species

Habitat types

- UK cliff-top habitats, ranging from hard to soft rock cliffs, support diverse ecosystems, including seabirds, unique plant communities, and a variety of invertebrates, with some cliffs even harboring rare species
- UK rocky shore habitats, found in the intertidal zone between high and low tide, are dynamic environments teeming with diverse life, including limpets, barnacles, seaweeds, and various crustaceans, adapted to harsh conditions
- UK pebble beaches, also known as shingle beaches, are vital habitats for wildlife, crucial for coastal erosion prevention, and are found along many parts of the UK coastline, including areas like Chesil Beach and Birling Gap.
- UK sandy beach habitats, vital coastal ecosystems, support diverse life, from microorganisms to shorebirds, and act as buffers against coastal erosion

Mission

To make our local beaches as healthy as possible



Challenge

Stabilise the biodiversity of our local beach to enable keystone species to thrive

Solutions

Baseline flora and fauna survey of entire coastal area
 Clearing litter from beach



In this project we will be exploring the features and influence of **African Masks** in Art and then using our understanding to design and create masks of our own!

MASK MOULD



GUM TAPE

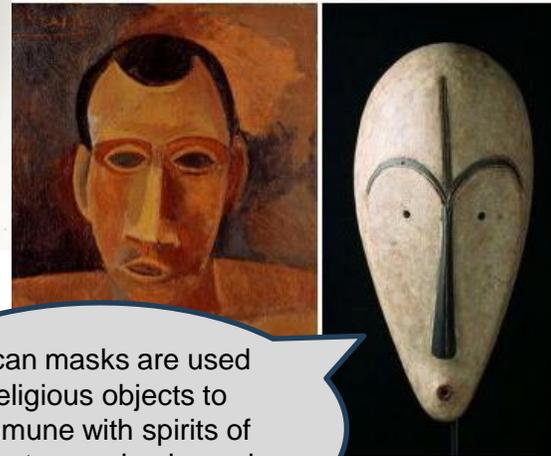
African masks are worn during masquerades to mark life stages and celebrations.



ADINKRA SYMBOLS

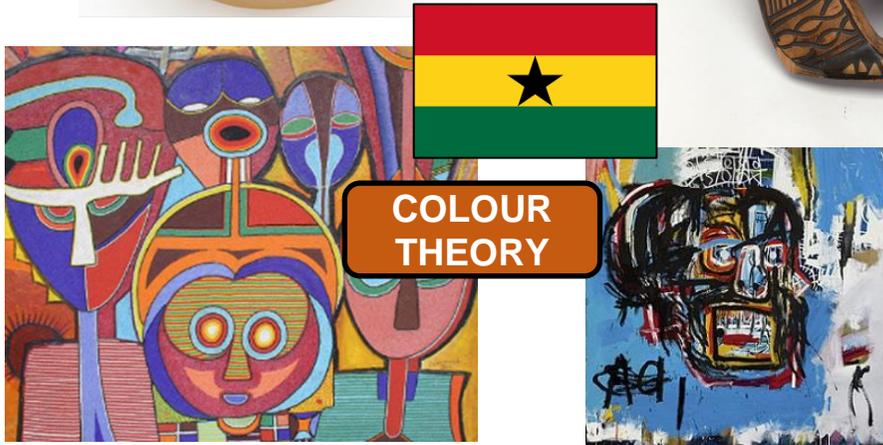


CUBISM



African masks are used as religious objects to commune with spirits of ancestors, animals, and the divine.

COLOUR THEORY



Key vocabulary

Culture
Primary colours
Secondary colours
Block colour
Abstract
Mixed media
Graffiti
Mold
Cubism
Street art
Symbols
Adinkra
Ceremonies
Masquerades
Ancestors

Artists we will study: Pablo Picasso, Jean-Michel Basquiat, Jimoh Buraimoh.



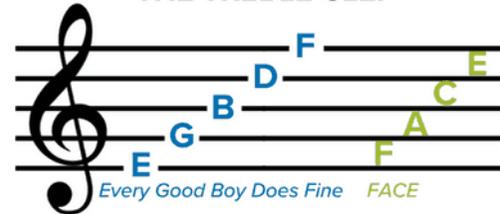
1. The Musical Elements are the basic building blocks of all music

Melody and pitch			Melody is The tune; high and low pitch notes
Articulation			Articulation Is The way a note is played; staccato (short) or legato (smooth)
Dynamics			Dynamics are how loud or quiet the music is
Texture			Texture is how thick or thin the music is (how many instruments are playing)
Structure			Structure is the layout of a piece (How it is put together)
Harmony			Harmony is the effect of two or more notes sounding simultaneously; chords, bass line
Instrument/timbre			Timbre is the specific sound an instrument makes
Rhythm			Rhythm is the pattern of long and short notes . Duration is how long or short the note is
Tempo			Tempo is how fast or slow the music is played

2. Keywords

Folk music	A traditional 'music of the people', handed down through the generations
Oral tradition	The passing down of folk music from generation to generation – lyrics and melodies – without writing them down
Orchestra	A large ensemble (group of musicians) divided into four sections - Strings, Woodwind, Brass and Percussion
Arrangement	A piece of music written in a different way to the original, e.g. changing the style, instrumentation, structure or mood
Chord	Two or more notes played together to form harmony
Chorus	The section of a song that is repeated identically after each verse
Drone	Usually one (or two continuously held notes in the bass)
Sea Shanty	A type of work song, sung by sailors on board ships

THE TREBLE CLEF



Semibreve 4 beat note	Minim 2 beat note	Crotchet 1 beat note	Quaver ½ beat note	Semi-quaver ¼ beat note



Vegetables, fruits, and cereals are the principal crops, accounting for about 3/4 of Spain's agriculture. Cereals are the principal crops, barley and wheat, are grown on the plains of Castile-León, Castile-La Mancha, and Andalusia, while rice is grown in coastal Valencia and southern Catalonia. Maize, grown in the north, is a major fodder product.



Rearing livestock accounts for just under half the value of Spain's total agricultural output. Pigs are raised mainly in Castile-León, Aragon, and Catalonia, and pork leads meat production in Spain, followed by poultry, beef, and lamb. In the Atlantic coastal regions and the dry southern interior, sheep and dairy cows are raised.

Spain is one of the world's largest producers of wine, grape growing is of considerable importance. The main wine-producing areas are La Rioja, Catalonia, Valdepeñas, Valladolid, and Málaga. Jerez de la Frontera in Andalusia, is also the centre of sherry production.

Cantidades

- Una docena   Un paquete
- Una tableta   Una barra
- Una caja   Gramos
- Kilos   Una botella
- Una lata   Un cartón

fruta y verduras

-  uvas
-  manzana
-  patata
-  melocotón
-  limón
-  ajo
-  plátano
-  cebolla
-  champiñones
-  lechuga
-  melón
-  pimiento
-  zanahoria
-  guisantes
-  aceitunas

Forests cover more than one-third of the total land area of Spain, with much of this woodland in the Cantabrian Mountains. Forestry contributes only a tiny fraction to Spain's agricultural production. Important forestry products are cork, eucalyptus, oak, pine, and poplar.

En el restaurante...

- Una mesa para...
Por favor
- De primer plato...
- De segundo plato....
- De postre.....
- Para mí...
- La Cuenta, por favor.
- A table for ... please
- As a starter I'd like....
- For my main course I'd like....
- For desert I'd like.....
- For me...
- The bill, please

With about 5,000 miles of coastline, Spain has an important fishing industry, which relies on fishing grounds off its coast and as far away as the Pacific and Indian oceans. The main fishing ports are in the northwest, especially Vigo and A Coruña.



Knowledge Organiser: Computational Thinking

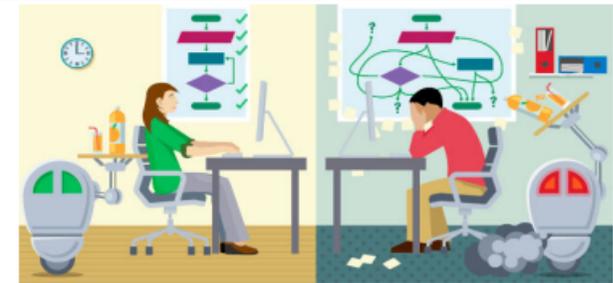
What is Computational Thinking

Computational thinking allows us to take a complex problem, understand what the problem is and develop possible solutions. We can then present these solutions in a way that a computer, a human, or both, can understand.

The Four Cornerstones of Computational Thinking are: Decomposition, Pattern Recognition, Abstraction and Algorithms

Decomposition

Decomposition is one of the four cornerstones of Computer Science. It involves breaking down a complex problem or system into smaller parts that are more manageable and easier to understand. The smaller parts can then be examined and solved, or designed individually, as they are simpler to work with.



Pattern Recognition

When we decompose a complex problem we often find patterns among the smaller problems we create. The patterns are similarities or characteristics that some of the problems share.

Pattern recognition is one of the four cornerstones of Computer Science. It involves finding the similarities or patterns among small, decomposed problems that can help us solve more complex problems more efficiently.

Abstraction

Once we have recognised patterns in our problems, we use abstraction to gather the general characteristics and to filter out of the details we do not need in order to solve our problem.

Abstraction is the process of filtering out – ignoring - the characteristics of patterns that we don't need in order to concentrate on those that we do. It is also the filtering out of specific details. From this we create a representation (idea) of what we are trying to solve.

Key Vocabulary

Abstraction	The process of separating and filtering out ideas and specific details that are not needed in order to concentrate on those that are needed.
Algorithm	A sequence of logical instructions for carrying out a task. In computing, algorithms are needed to design computer programs.
Decomposition	The breaking down of a system into smaller parts that are easier to understand, program and maintain.
Pattern Recognition	Finding similarities and patterns in order to solve complex problems more efficiently.
Program	Sequences of instructions for a computer.
Programming	The process of writing computer software.

Algorithms

An algorithm is a plan, a set of step-by-step instructions to resolve a problem. In an algorithm, each instruction is identified and the order in which they should be carried out is planned.

What is an algorithm?

Algorithms are one of the four cornerstones of Computer Science. An algorithm is a plan, a set of step-by-step instructions to solve a problem. If you can tie shoelaces, make a cup of tea, get dressed or prepare a meal then you already know how to follow an algorithm.

Evaluating Solutions

Before solutions can be programmed, it is important to make sure that it properly satisfies the problem, and that it does so efficiently. This is done through evaluation.

Evaluation is the process that allows us to make sure our solution does the job it has been designed to do and to think about how it could be improved.

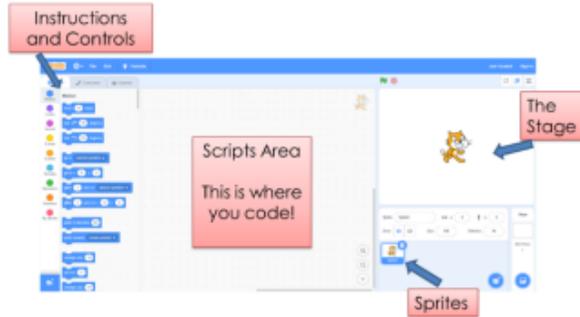
Failure to evaluate can make it difficult to write a program. Evaluation helps to make sure that as few difficulties as possible are faced when programming





The Scratch Interface

Instructions and Controls	This area contains various blocks of code, which allows you to piece together logic in order to code your programs
Scripts Area	This is the workspace upon which you drag and join the required blocks of code, to create the logic for your program
The Stage	This is the canvas on which your program will be displayed.
Sprites	Programmable objects. For example, if you are creating a game, your character would be a sprite.



Key Vocabulary

Key Word	Definition
Sprite	An object which can be programmed in Scratch
Block	A piece of programming code in Scratch
Inputs	Values which get sent from the user into the computer
Variables	The place where inputs get stored by the program (they represent memory locations)
Outputs	The values which get sent from the computer to the user
IF Statement	The logic used to program decisions in programs

Inputs

The ASK block is an input script. When it is run, it will pause the program and wait for the user to enter some text.

The input will be stored in a variable called 'answer'.

Variables

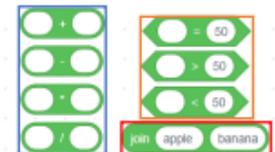
Variables represent locations in memory where data is stored. We can create as many variables as we like when we program (we don't have to only use the ASK block). We can therefore store as many inputs as we like, all while the program is running.

Variables are created in the orange 'variables' blocks section.

If we wish to add data to a variable, we use the 'Set' block.

Operators

The operator blocks allow us to perform calculations, see how data relates to each other and join text and variable contents together. Below is an example of some of arithmetic operators, relational operators and also the concatenation (joining) operator.



Outputs

The SAY block is an output script. When it is run, it will output whatever is contained in its contents box, for a given number of seconds.

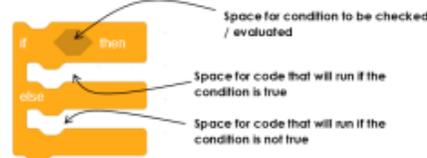
We can also insert variables into the say script, so that the contents of variables can be outputted. The JOIN operator can be used to join together the contents of variables with some text.

IF Statements

IF statement allows programs to take different pathways depending on conditions.

In Scratch, the IF block contains spaces for...

- a condition to be checked
- blocks to run if the condition is true
- blocks to run if the condition is false.



For more pathways, IF blocks can be placed inside other IF blocks.

If this condition is TRUE (i.e. if answer contains a 1), then the program will output 'Sorry to hear that you are not...'. However, if this condition is FALSE (i.e. if answer does not contain a 1), then the program will run another IF statement, to check if answer contains a 2.

And if it doesn't contain a 2, then it will run another IF statement to check if answer contains a 3.

And if it doesn't find either a 1, 2 or a 3 in the answer variable, then it will output an error message.