



**Year 9**

**Learning Cycle 3**

Student Name: \_\_\_\_\_

# Home Learning timetable - when I am going to complete my home learning

	Mon A	Tue A	Wed A	Thu A	Fri A
<b>Core Activity</b>	1 hour of reading for pleasure 1 hour of SPARX Maths XP and target practice				
<b>Subject 1</b>	Maths	English	History	Science	Geography
<b>Subject 2</b>	DT	Food	Drama	Spanish	Music
	Mon B	Tue B	Wed B	Thu B	Fri B
<b>Core Activity</b>	1 hour of reading for pleasure 1 hour of SPARX Maths XP and target practice				
<b>Subject 1</b>	Maths	English	History	Science	Geography
<b>Subject 2</b>	Computing	Art	RE	Spanish	

# Year 9 Learning Cycle 3 Knowledge Check Timetable

Lesson		17/06	18/06	19/06	20/06	21/06	24/06	25/06	26/06	27/06	28/06
		A					B				
		Mon	Tue	Wed	Thu	Fri	Mon	Tue	Wed	Thu	Fri
1	9X1/A			Drama			Food			Maths	
	9X2/S			Music			Drama			Maths	
	9X3/P			RE			Music			Maths	
	9Y1/I			Art			RE		Science	English	
	9Y2/R			DT			Art		Science	English	
	9Y3/E		Computing	Food			Dt		Science	English	
2	9X1/A						History		DT		
	9X2/S						Spanish		Food		
	9X3/P						History		Drama	Spanish	
	9Y1/I				Computing			Spanish	Music		Maths
	9Y2/R							Geography	RE		Maths
	9Y3/E							Spanish	Art		Maths
3	9X1/A	RE					Art	Spanish		English	
	9X2/S	Art					Dt	History		English	
	9X3/P	DT					Food	Computing		English	
	9Y1/I	Food					Drama				
	9Y2/R	Drama	Computing				Music				
	9Y3/E	Music					RE				
	9X1/A			Music				Computing	Science		
	9X2/S			RE				Geography	Science	Computing	
	9X3/P			Art				Geography	Science		
	9Y1/I			DT			Geography			History	
	9Y2/R			Food			Spanish		History		
	9Y3/E			Drama			History		Geography		

# How to Use your Learning Cycle Knowledge Organiser

Poltair School believe that the Learning Cycle Knowledge Organiser should be used daily for classwork and home learning. The Learning Cycle Knowledge Organiser will inform students and parents of topics that are being covered in class during each learning cycle, enabling all students to extend their learning outside of the classroom.




At Poltair we **SORT** it!

## What are the SORT strategies?

Summarise	Organise	Recall	Test
Summarise and condense any class notes, revision guides and revision.	Organise your revision materials by topic/subtopic. Traffic light your PLC sheets to identify areas of weakness or gaps (Red/Amber) that need to be prioritised.	Use active recall and spaced repetition to memorise your knowledge organisers until you can recall the information <u>e.g.</u> Look, cover, write or self-testing	Use low stakes online tests/quizzes and answer high stakes past paper/sample questions to check and apply knowledge and understanding
Strategies			
<ul style="list-style-type: none"> <li>• Cornell Notes</li> <li>• Flash cards</li> <li>• Mind mapping</li> <li>• Revision clocks</li> <li>• Dual coding</li> </ul>	<ul style="list-style-type: none"> <li>• How to use your PLC</li> <li>• How to schedule your home learning and stick to it!</li> </ul>	<ul style="list-style-type: none"> <li>• Look cover &amp; test</li> <li>• Leitner system</li> <li>• Blur it</li> <li>• Transform it</li> </ul>	<ul style="list-style-type: none"> <li>• Low stakes</li> <li>• Self-quizzing</li> <li>• Quiz each other</li> <li>• Online quizzes</li> <li>• High stakes</li> <li>• Exam style questions</li> </ul>

# How to use SORT

Step 1: <b>O</b> rganise	Step 2: <b>S</b> ummarise	Step 3: <b>R</b> ecall	Step 4: <b>T</b> est
<p>a. Use the daily planner on page 8 to identify all the times when you will complete your home learning and when you will complete independent revision.</p> <p>b. RAG each of the PLCs so you identify your RED topics – the ones that you are unsure of, or you do not fully understand.</p> <p>c. Write your RED topics into your daily planner for when you will revise that subject</p>	<p>When you revise for a specific topic use your knowledge organiser, revision guide, website etc to summarise the key knowledge you need to learn.</p> <p>Use any summarizing strategy, such as:</p> <ul style="list-style-type: none"> <li>• Flashcards</li> <li>• Mind maps</li> <li>• Cornell Notes</li> <li>• Revision Clocks</li> </ul> <p>For more details go to the SORT webpage:  <a href="https://www.poltairschool.co.uk/sort">https://www.poltairschool.co.uk/sort</a></p> 	<p>Once you have summarized the knowledge, you need to actively memorise it. This is the most important part of the revision process!</p> <p>You could use any of the following strategies to help:</p> <ul style="list-style-type: none"> <li>• Lietner System</li> <li>• Blurf It</li> <li>• Look, say, cover, write, test</li> </ul>	<p>The last step in revision is to be confident that you can recall and retrieve the knowledge. To do this you need to <u>test</u> yourself. Quick and simple ways are to ask someone else to quiz you on the knowledge or to complete an online quiz. You can also answer past exam questions.</p> <p>If you cannot confidently recall the knowledge you will need to repeat step 3.</p>



At Poltair we **SORT** it!

# ATTENDANCE FOCUS

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Attendance Reflection Sheet	
What is your current attendance?	
How many sessions have you missed of school?	
How many 'I' coded sessions have you had?	
How many 'M' coded sessions have you had?	
How many 'L' coded sessions have you had?	
How many 'U' coded sessions have you had?	
How many 'O' coded sessions have you had?	
How many days does this equate to so far this year?	
If this attendance continued, how many days off would you have this year?	

To improve my attendance, I commit to the following:	
1.	
2.	
3.	
What attendance do you want to end this term with?	
What is your end of year attendance target?	
What is our minimum expected attendance to be rewarded?	

### Possible strategies to REACH MY attendance Goals

- I will make attending school every day a priority.
- I will keep track of my attendance and absences.
- I will set my alarm clock for \_\_\_\_\_ a.m.
- I will attend school everyday unless I am truly sick.
- I will find a relative, friend or neighbour who can take me to school if I miss the bus.

- If I am absent, I will contact my teachers to find out what I missed.
- I will set up medical and dental appointments for weekdays after school. If I must make a medical appointment during the school day, I will try to attend school for most of the day.
- When I am struggling with a challenge that is keeping me from school I will confide in an adult at school and seek help.

# Home Learning & Revision Planner

Time	Monday	Tuesday	Wednesday	Thursday	Friday	Time	Saturday	Sunday
8.30am - 4pm						8.30am - 4pm		
4pm - 5pm						4pm - 5pm		
5pm - 6pm						5pm - 6pm		
6pm - 7pm						6pm - 7pm		
7pm - 8pm						7pm - 8pm		
8pm - 9pm						8pm - 9pm		



# Year 9 Learning Cycle 3 Personal Learning Checklists

## English

Key Ideas	S	O	R	T
I can understand a key character in Jekyll and Hyde.				
I can understand a key character in Frankenstein.				
I can develop my analysis of a key character using themes and context.				
I understand the plot of Lord of the Flies.				
I can explain how Golding presents the the themes of violence, power and human nature using characters and events in the novel.				
I can support my ideas using judicious quotations.				
I can analyse language used by Golding.				
I can analyse structure methods used by the writer.				

## English

Key Ideas	S	O	R	T
I can use 'big ideas' and concepts from the novel to inspire my own ideas and opinions.				
I can plan an extended opinion text.				
I can establish a clear argument in my writing and continue this strong line of argument as a 'thread' throughout my extended opinion writing.				
I can use pathos, ethos and logos to support my purpose.				
I can use a range of sophisticated vocabulary to present a point of view.				
I can use a range of punctuation accurately in my opinion writing.				
I can use a range of sentence starters and structures in my opinion writing.				

## Mathematics

Key Ideas	SPARX	S	O	R	T
I can convert between improper fractions and mixed numbers.	M601				
I can add and subtract fractions and mixed numbers.	M835, M931				
I can multiply and divide fractions and mixed numbers.	M157, M197, M110, M265				
I know the facts about angles in parallel lines.	M606				
I can find the sum of interior/ exterior angles in a polygon.	M654				
I can solve linear equations.	M707, M634, M647				
I can calculate the probabilities of single events.	M938, M755				
I can calculate the probability of combined events.	M718, M299 (H)				
I can convert between fractions, decimals and percentages.	M264				

# Year 9 Learning Cycle 3 Personal Learning Checklists

## Mathematics

Key Ideas	SPARX	S	O	R	T
I can calculate a percentage of an amount, increase and decrease.	M437, M905, M476, M533				
I can solve problems with reversed percentages.	M528				
I can find a percentage change.	U278				
I can translate a shape using a vector.	M139				
I can enlarge a shape using a scale factor.	M178				
I can reflect a shape over a mirror line.	M290				
I can rotate a shape given an angle and a point.	M910				
I can describe transformations.	M881				

## Science – Our changing planet

Key Ideas	S	O	R	T
The composition of Earth's modern atmosphere – including the percentages of each gas				
The development of Earth's modern atmosphere – how carbon dioxide decreased, and water increased				
The process of the greenhouse effect, and the effect that humans are having				
How to make sustainable choices to reduce our carbon footprint				
The name, source and effects of atmospheric pollutants – carbon monoxide, carbon particulates, nitrogen oxides and sulphur dioxide				
How to test for common gases – oxygen, carbon dioxide, chlorine and hydrogen				
How polymers are formed, and their uses				
The water cycle				

## Science – Energy resources

Key Ideas	S	O	R	T
State the frequency and potential difference of mains electricity				
Describe the difference between alternating and direct current				
Describe the national grid and explain why transformers are important				
Explain how a 3 pin plug works, referring to live, neutral and earth wires.				
Name energy resources and identify them as finite or renewable				
Compare energy sources, referring to their advantages and limitations				
Choose the best energy sources to meet demand in certain areas, and justify your choices				
Perform calculations relating to power: $E=pt$ , $P=VI$ and $P=I^2R$				

# Year 9 Learning Cycle 3 Personal Learning Checklists

## Art

Key Ideas	S	O	R	T
I can understand and explain the meaning of the 7 observational drawing key words, tone, texture, shape, scale, line and composition.				
I can discuss and compare the work of Banksy, Sheperd Fairey & Hannah Hoch.				
I can understand what a political cartoon is?				
I understand how to research and select information to develop ideas.				
I understand how to develop my ideas using the work of political cartoonists to design and create a final outcome.				
I understand how to use my chosen materials with skill and flair.				

## Computing

Key Ideas	S	O	R	T
I can explain what a network is.				
I can explain the difference between the WWW and the Internet				
I can identify the parts of a web page				
I can define the term accessibility and explain how this can be achieved in web design				
I understand the design choices for different audiences				
I can recognise HTML key words				
I can edit HTML to change format and design of a webpage				
I know the difference between the WWW and the internet				
I can create and use CSS statements				

## Design Technology

Key Ideas	S	O	R	T
I can identify the main parts of a mechanical system, including a crank, cam, follower and gears.				
I can name the 4 types of motion.				
I can give examples of the 4 types of motion.				
I can design a system to convert one type of motion into another.				
I can use gears to change the speed of rotation in a mechanical system.				

# Year 9 Learning Cycle 3 Personal Learning Checklists

## Drama

Key Ideas	S	O	R	T
I am able to structure a performance thinking about how a story can be told.				
I can describe what a stimulus in Drama and would know how to use one to generate ideas.				
I can work effectively with my group to share and explore ideas.				
I can use a range of dramatic techniques when devising.				
I can think about the style of my performance and therefore what devices and techniques are appropriate.				
I can use physical skills effectively in my performance.				
I can use vocal skills effectively in my performance.				

## Food

Key Ideas	S	O	R	T
I can create a dovetailed time plan with three ingredients.				
I can explain the terms dextrinisation, coagulation, denaturation and coagulation with examples				
I can discuss why recipes may need to be adapted or ingredients substituted.				
I can explain why it is important to know your BMR, BMI and PAL				
I can discuss how to adapt a pasta dish				
I can explain how our tongue uses taste receptors to taste.				

## Geography

Key Ideas	S	O	R	T
Define ecosystem				
Name the components of an ecosystem				
Name and locate global biomes				
Explain the causes of uneven development				
Locate and describe the tropical rainforest biome				
Describe the climate and location of the Amazon rainforest				
Explain how plants and animals adapt to the rainforest				
Explain the causes of deforestation				
Explain the effects of deforestation				
Evaluate strategies to protect tropical rainforests				

# Year 9 Learning Cycle 3 Personal Learning Checklists

## History

Key Ideas	S	O	R	T
I can state what Crime and Punishment was like at different periods in time				
I can explain what influence the Church had on Crime and Punishment in the Medieval and Early Modern periods				
I can explain the influence the government and monarch have had on Crime and Punishment				
I can explain examples of corporal and capital punishment and why we no longer use these				
I can state specific facts and examples of Crime and Punishment from medieval to present day				
I can explain the importance of National Events for the site of Bodmin Jail				
I can retell the narrative of Bodmin Jail and its uses over time				

## Music

Key Ideas	S	O	R	T
I am able to understand what different structures and forms are and can explain them to others.				
I am able to understand how lyrics can be used to tell a story.				
I can work out chords on an instrument using my knowledge of what they are.				
I understand the difference between a major and a minor chord and can hear the differences.				
I understand what a melody is and how it uses harmony to enhance it.				
I can create a simple and catchy melody using an instrument.				

## Religious Education

Key Ideas	S	O	R	T
I can define resurrection				
I can define Akhirah				
I can outline the beliefs about life after death in Islam				
I can outline the beliefs about life after death in Hinduism				
I can outline the beliefs about life after death in Christianity				
I can outline the beliefs about life after death in Sikhism/Sikh				
I can outline the beliefs about life after death in Buddhism				
I can outline the Humanist approach to life after death				

# Year 9 Learning Cycle 3 Personal Learning Checklists

## Spanish

Key Ideas	S	O	R	T
I can give my opinion of the different school subjects that I study				
I can describe my school uniform				
I can discuss school rules and express my opinion of them				
I can talk about what has happened recently at school				
I know how to revise for a reading and listening exam				
I can talk about my aspirations for the future				
I can describe what I would do during a gap year in South America				

# Year 9 English Learning Cycle 3– Monsters and Men

## The Strange case of Dr Jekyll and Mr Hyde by Robert Louis Stevenson

### 1. The Text

**1a = Plot** A narrative about the complexities of science and the **duplicity** of human nature. Dr Jekyll is a kind, well-respected and intelligent scientist who meddles with the darker side of science, as he wants to bring out his 'second' nature.

He does this through transforming himself into Mr Hyde - his evil alter ego who doesn't repent or accept responsibility for his evil crimes and ways. Jekyll tries to control his alter ego, Hyde, and for a while, Jekyll has the power. However, towards the end of the novel, Hyde takes over and this results in their deaths.

#### 1b = Gothic Genre

A literary genre originating from the 18th century, which describes a sinister, grotesque or mysterious atmosphere. Such novels are often set in dark places or ruined buildings.

### 2. Themes

#### 2a = Scientific development

In the **Victorian** era, religion was important to communities and individuals. Many people believed that God created the universe and he was the sole creator, therefore the principles and the word of the Bible must be followed. Due to the society's interest in religion, people were afraid of scientific developments and feared what this would do to mankind.

#### 2b = Good vs Evil ( the Duality of human nature)

Stevenson writes about the **duality** of human nature – the idea that every single human being has good and evil within them. Stevenson describes how there is a good and an evil side to everyone's personality, but what is important is how you behave and the decisions you make. The choices people make determine whether a person is good or not.

#### 2c = Nature and the Supernatural

Jekyll's experiment is his desire to change the natural course of his being through science. The idea of the supernatural is evident in the release of Mr Hyde into the world.

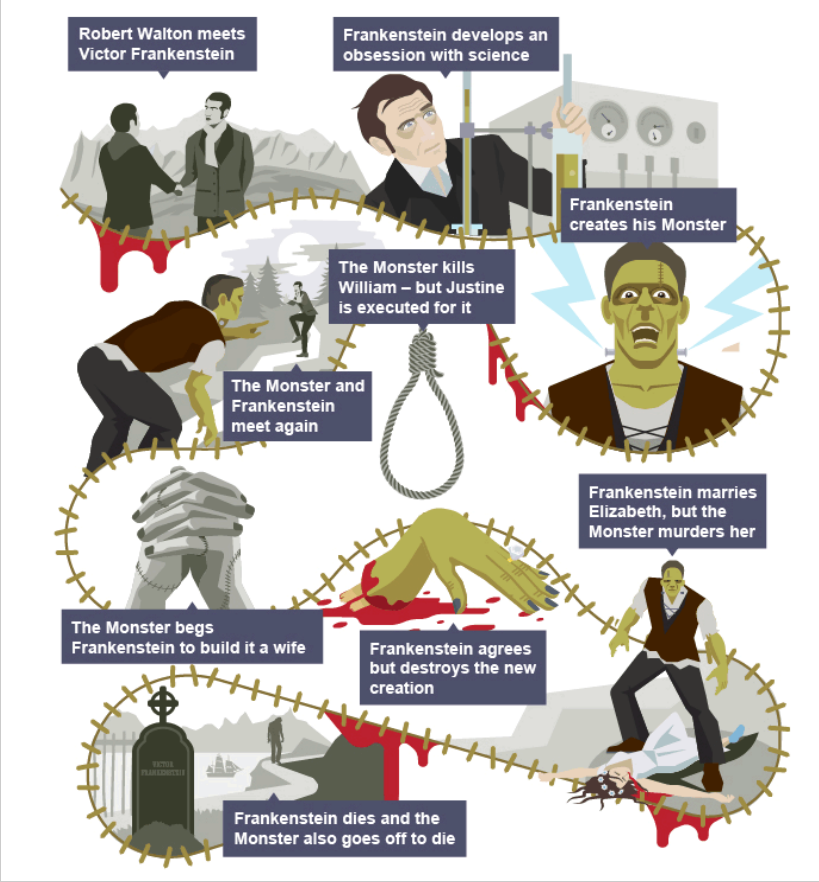
### 3. Jekyll and Hyde – Plot Overview





# Year 9 English Learning Cycle 3– Monsters and Men

Frankenstein by Mary Shelley

1. Mary Shelley & Context	2. Themes	3. Frankenstein– Plot Overview
<p><b>1a = Mary Shelley</b> is considered to be the first science fiction writer. She wrote Frankenstein in 1818 as part of a short story competition between friends.</p>	<p><b>2a = Knowledge and discovery</b></p> <p>Written at a time when the boundaries of scientific knowledge, geographical discovery and technological change were being challenged, Frankenstein looks at the key question of whether mankind can have too much knowledge and, therefore, too much power.</p>	
<p><b>1b = Genre: Romanticism</b></p> <p>Elements of Romanticism in Frankenstein are the power of nature, the isolated hero, intense feelings and wild and rugged landscapes</p>	<p><b>2b = Justice</b></p> <ul style="list-style-type: none"> <li>the legal system – shown to be less than perfect after the wrongful arrest of 2 of the characters</li> <li>personal justice – Victor abandons the monster, who seeks personal justice in the form of a companion</li> <li>collective justice – sometimes the needs of a group must outweigh the needs of an individual.</li> </ul>	
<p><b>1c – Genre: Gothic</b></p> <p>Elements of Gothic in Frankenstein are the monster, the setting, females in danger and extreme emotions</p>	<p><b>2c = Prejudice</b></p> <p>Prejudice and its effects are traced by Shelley in the novel and are centred on the experiences of the Monster. Rejected by his creator and everyone else he encounters, the Monster soon finds itself despised and alone in the world. It withdraws into a state of isolation and utter misery but this in turn leads to the development of an intense hatred and a desire for revenge.</p>	
<p><b>1D- structure</b></p> <p>In Frankenstein, Mary Shelley starts with a framing narrative (Walton's letters to his sister), before moving to the main narrative (Victor's story) and then contained within this is the Monster's story of survival and how he learns from the De Lacey family. There are three separate narrators.</p>		<p>Frankenstein tells the story of gifted scientist Victor Frankenstein who succeeds in giving life to a being of his own creation. However, this is not the perfect specimen he imagines that it will be, but rather a hideous creature who is rejected by Victor and mankind in general. The Monster seeks its revenge through murder and terror.</p>



# Year 9 English Learning Cycle 3– Lord of the Flies William Golding

## 1. William Golding & context

**1a** = Golding served in the British Navy during the Second World War (1939-1945) and believed that wars were more about human nature than politics.

**1b** = Golding worked as a schoolteacher before and after his navy career, and noticed how cruel children could be to each other.

**1d** = Lord of the Flies was published in 1954, less than 10 years after the end of World War Two. Throughout the 1950s, when Golding was writing, people were terrified that another war would mean the whole world being destroyed by nuclear bombs. This fear is reflected in Lord of the Flies as the fictional world is at war, which explains why the boys' plane was shot down. Piggy even thinks an atomic bomb has gone off and they won't be rescued at all.

## 2. Themes

### 2a = Violence

Away from civilisation and free from rules, the boys quickly begin to turn to violence and cruelty. Under Jack's leadership, they hunt and kill pigs. By the end of the novel, they are hunting and killing each other. The characters who resist violence, like Simon, Piggy and Ralph, become victims. It is only when the adults return that the violence stops.

**2b = Power** The novel centres around the power struggle between Ralph and Jack. They have different leadership styles:

- Ralph represents the kind of power that comes from a **democracy** when people vote freely to choose their leaders and rules.
- Jack represents the kind of power that comes from **dictatorship** when one person takes complete power and keeps that power through fear and violence.

**2c = Human Nature** In Lord of the Flies, Golding explores the idea that basic human nature is violent and selfish. He questions whether human beings would still behave in a civilised way without rules. For example:

- Early in the novel, the boys play when they should be working and choose which rules to obey. As the novel continues, they give in to their fear of an imaginary monster, lose their self-control and increasingly turn to violence.

## 3. Timeline



# Year 9 English Learning Cycle 3– Lord of the Flies William Golding

## 4. Characters

**3a = Ralph** - chosen by the boys to be their leader and tries to create a fair society with clear rules. He is **reasonable** and **decisive**.

**3b = Piggy** - Piggy becomes Ralph's most **loyal** friend and follower. He wears glasses, suffers from asthma and is overweight. He is **clever** but most of the other boys can't see his strengths and don't respect him.

**3c = Jack** - He is **strong-willed, cruel** and **proud**. He is used to being in charge as he is the Head Boy of his school and leads the boys' choir. Jack wants power and becomes obsessed with hunting and violence.

**3d = Simon** - Simon is a **shy** boy and often spends time alone. He has fainting fits and experiences hallucinations. Simon stands up for others and bravely tries to find out more about the mysterious beast. He is the only one who understands that the beast is not real.

**3e = Roger** Introduced as a quiet and intense older boy, Roger eventually becomes a sadistic and brutal terrorist over the course of Lord of the Flies.

**3f = Sam and Eric**- Sam and Eric are twin older boys on the island who are often referred to as one entity, Samneric. Sam and Eric are easily excited, regularly finish one another's sentences, and exist within their own small group of two.

**3g = The Littl'uns** – the smaller boys on the Island.

## 5. Plot

After their plane is shot down, a group of **English schoolboys** are stranded on a **deserted island** in the Pacific Ocean. There are **no adults** to look after the boys, who range from six to 12 years old.

At first, they work together to survive. They vote that **Ralph**, one of the older boys, should be 'chief' and choose **Jack** to oversee hunting. They create and follow rules, hold meetings and use a conch shell to show whose turn it is to speak.

They create a **signal fire**, using a boy called **Piggy's glasses**, but it burns out of control. Jack becomes obsessed with **hunting** the pigs on the island and his group of hunters fail to keep the signal fire going when a ship goes past.

The smaller boys become increasingly **frightened** by the idea that there is a "**beastie**" on the island. One night, a dead parachutist gets caught in a tree and the boys think that it is the beast coming to attack them.

Jack and Ralph **argue**. Jack leaves the group and the hunters follow him. They **kill** a pig, leaving the head as an offering to the beast.

A quiet boy called **Simon** has a strange vision where he thinks the pig's head is talking to him. He faints. When he appears out of the shadows, covered in blood, the boys kill him in a **wild frenzy**.

Jack's hunters **attack** Ralph and his group, smashing the conch, killing Piggy and setting fire to the island. Ralph narrowly misses being killed by the hunters' spears and runs to the beach where he is surprised by a **naval officer**.

A passing naval ship had seen the fire on the island and launched a boat to investigate. The officer assumes that the boys have been up to "fun and games". The boys stop fighting and begin to cry. They have been **rescued**.



## 6. Vocabulary

**6a = covert (adjective)**  
not openly acknowledged or displayed

**6b = conflict (noun)** a serious disagreement or struggle between two people groups or forces

**6c = usurp (verb)** take a position of power illegally or by force

**6d = clamour (noun)**  
a loud and confused noise, especially that of people shouting

**6e = solemn (adjective)** having or showing serious purpose and determination; very serious or formal in manner or behaviour

**6f = mankind (noun)** all human beings

**6g = mercy (noun)** compassion or forgiveness shown towards someone who you could punish or harm

**6h = inscrutable (adjective)**  
difficult or impossible to understand

**6i = cower (verb)**  
Crouch down in fear

**6j = scornful (adjective)**  
Expressing extreme contempt

**6k = recrimination (noun)**  
An accusation in response to someone else's.

**6l = furtive (adjective)**  
Secret and sly

**6m = ludicrous (adjective)**  
Inviting ridicule, foolish, out of place.

## 7. Subject Vocabulary

**7a = allegory (noun)** - a story with a hidden meaning

**7b = Symbolism (noun)**  
the use of symbols to represent ideas or qualities

**7c = Structure (noun)**  
How a text is organised by the writer

**7d = Contrasts (noun)**  
a thing or person having qualities noticeably different from another

**7e = language (noun)**  
Words or methods (techniques) used by writers to present their meanings or create effects.

**7f = setting (noun)**  
Where or when the play takes place, usually introduced at the exposition (beginning) of a story.

**7g = characterisation (noun)**  
The creation or construction of a fictional character.

**7h = Form (noun)**  
Lord of the Flies is an Adventure Novel.

**7i = pathetic fallacy (noun)**  
Giving human feelings and emotions to something not human, particularly the weather or environment, to enhance the mood of the writing.

**7j = imperative verbs (noun)**  
Verbs that express a command or an instruction e.g. 'Sit down' and 'Carry those logs.'

**7k = Foreshadowing (verb)**  
a warning or indication of (a future event)



## 8. What, How, Why Paragraphs

**WHAT** is the writer saying about character/theme/setting?

**HOW** are they revealing information and creating effects for the reader?  
Quotation?  
Language methods?

**WHY** have they chosen to do this?  
Purpose?

The character Ralph confronts the central theme of humanity versus savagery. Golding writes, "What are we? Humans? Or animals? Or savages?" Through Ralph's question, the reader ponders the innate duality within human nature. By juxtaposing the boys' civilized upbringing with their descent into primal instincts and violence, Golding skillfully reveals the fragility of societal norms and the potential for cruelty within every individual.



# Year 9 Learning Cycle 3 Mathematics – Core Knowledge

x	1	2	3	4	5	6	7	8	9	10
1	1	2	3	4	5	6	7	8	9	10
2	2	4	6	8	10	12	14	16	18	20
3	3	6	9	12	15	18	21	24	27	30
4	4	8	12	16	20	24	28	32	36	40
5	5	10	15	20	25	30	35	40	45	50
6	6	12	18	24	30	36	42	48	54	60
7	7	14	21	28	35	42	49	56	63	70
8	8	16	24	32	40	48	56	64	72	80
9	9	18	27	36	45	54	63	72	81	90
10	10	20	30	40	50	60	70	80	90	100

**Square numbers:** 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144

**Cube Numbers :** 1, 8, 27, 64, 125

**Prime numbers:** 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47...

## Useful features on your calculator:

**FACT:** this express a number as a product of its prime factors

**RATIO (menu 4):** this will find missing values within equivalent ratios

**Table (menu 3):** This is where you can generate values within a table- useful for plotting graphs and generating terms of a sequence

**Statistics (menu 2):** this will find all of the averages from a table of data

**o/":** This is the time button and can do conversion between time units, as well as calculations with different times

**Fraction button:** can be used for ay calculations with fractions

**S-D:** Converts decimal answers to fractions and vice versa



# Year 9 Learning Cycle 3 Mathematics – Sparx Information

- Homework will be set on Tuesday's and will be **due on Tuesday morning at 7:00am**
- You must complete 100% of the homework- if you have not got 100% of the questions correct, then you have not done your homework
- You will receive a merit for completion of your homework
- If you complete one of the extra homework's- XP Boost or Target, you will receive another merit.- they must be 100% complete
- Sparx clinics will run Monday, Tuesday, Thursday in Arc 2- where a Maths teacher will be on hand to support you, if you are unsure
- It is your responsibility to seek help BEFORE the deadline, if you get stuck
- Your bookwork will be checked in lessons- you must write full workings
- You must bring your homework book to the first lesson after Tuesday 7:30am- if you do not have your book, then you have not completed your homework

# Year 9 Mathematics Learning Cycle 3 Knowledge Organiser

1. Key Words	Definition
Fraction	A numerical quantity that is not a whole number (e.g. $\frac{1}{2}$ , 0.5).
Decimal	A system of numbers and arithmetic based on the number ten, tenth parts, and powers of ten.
Numerator	The number above the line in a fraction
Denominator	The number below the line in a fraction; a divisor.
Equivalent	Equal in value, amount, function, meaning
Parabola	A curved graph, either U shaped or n shaped.
Polygon	A 2-d shape with 3 or more straight edges
Regular shape	A shape where all of the angles are equal and all of the side lengths are equal
Transversal	A line which crosses two other lines
Alternate angles	Angles which occur on opposite sides of the transversal and are equal.
Corresponding angles	Angles which occur on the same side of the transversal and are equal.
Co-interior angles	Angles which occur between two parallel lines when they are intersected by a transversal.
Enlargement	A type or transformation which changes the size of a shape and its distance from a fixed point (centre of enlargement)
Translation	A type of transformation which moves a shape using a vector
Reflection	A type of shape which sees each vertex of a shape reflected across a mirror line
Rotation	A type of transformation where a shape is rotated around a fixed point
Transformation	A process which changes a shapes size, position or orientation.

# Year 9 Mathematics Learning Cycle 3 Knowledge Organiser – Fractions and Reciprocals

## 1. Converting Between Mixed Numbers and Improper Fractions

To find the numerator:

- Multiply the whole number by the denominator
- Then add the numerator

The denominator stays the same

$$2\frac{3}{4} = \frac{(4 \times 2) + 3}{4} = \frac{11}{4}$$

## 2. Adding and Subtracting Fractions

- Convert any mixed numbers to improper fractions before beginning calculation
- Identify the LCM of the denominators
- Use equivalent fractions to convert each fraction to have the LCM as the denominator
- Add/subtract the numerators

$$\frac{1}{2} + \frac{1}{3} = ?$$

$$\frac{1}{2} \times \frac{3}{3} = \frac{3}{6} \quad \frac{1}{3} \times \frac{2}{2} = \frac{2}{6}$$

$$\frac{3}{6} + \frac{2}{6} = \frac{5}{6}$$

## 3. Multiplying Fractions

- Convert any mixed numbers to improper fractions before beginning calculation
- Multiply the numerators
- Multiply the denominators
- Simplify if you can

$$\frac{3}{4} \times \frac{2}{5} = \frac{3 \times 2}{4 \times 5} = \frac{6}{20} \quad \leftarrow \text{Simplify?}$$

## 4. Reciprocals

- What you multiply a number by to get an answer of 1
- Flip the fraction
- If you have a whole number, think of it as a fraction with denominator 1

$$\frac{3}{4} \times \frac{4}{3} = 1 \quad \text{Reciprocal}$$

$$\frac{6}{1} \times \frac{1}{6} = 1$$

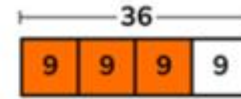
## 5. Dividing Fractions

- Convert any mixed numbers to improper fractions before beginning calculation
- Keep the first fraction the same
- Flip the second fraction
- Multiply instead of divide

$$\frac{4}{11} \div \frac{5}{9} = \frac{4}{11} \times \frac{9}{5} = \frac{36}{55}$$

## 6. Fractions of Amounts

- Divide by the denominator
- Multiply by the numerator



$$\frac{1}{4} \text{ of } 36 = 9$$

$$\frac{3}{4} \text{ of } 36 = 27$$

## 7. Expressing One Quantity as a Fraction of Another

20p as a fraction of £2.00    Change the £2.00 to pence = 200p.

Write the quantities as a fraction as follows:

$$\frac{20p}{200p} \quad (\text{The } p \text{ cancels out then reduces to the lowest term})$$

$$\frac{1}{10}$$

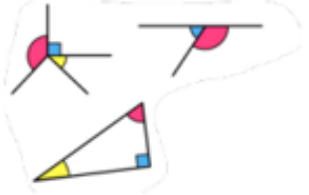
20p is  $\frac{1}{10}$  of £2.00.



# Year 9 Mathematics Learning Cycle 3 Knowledge Organiser – Lines and Angles

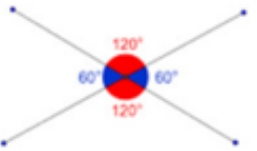
## 1. Basic Angle Facts

- Angles on a straight line sum to  $180^\circ$
- Angles on a triangle sum to  $180^\circ$
- Angles around a point sum to  $360^\circ$

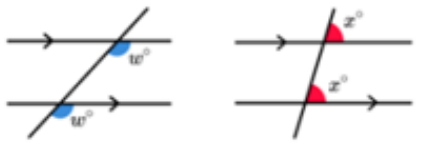


## 2. Turning Point of a Quadratic Graph

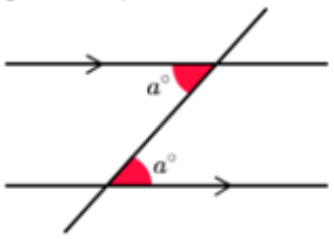
Vertically opposite angles are equal



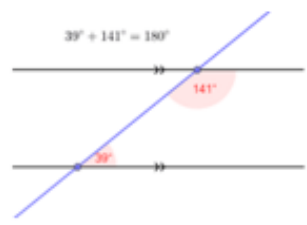
Corresponding angles are equal



Alternate angles are equal



Co-interior angles sum to  $180^\circ$



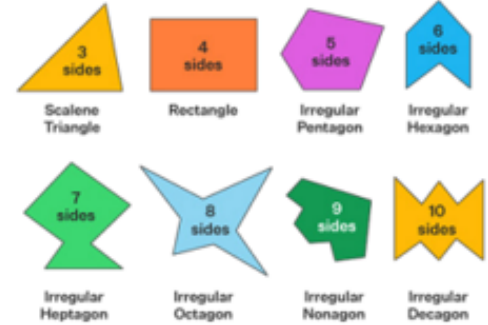
## 3. Quadrilaterals

<p><b>Square</b> 4 equal angles 4 equal sides</p>	<p><b>Rectangle</b> 4 equal angles</p>
<p><b>Rhombus</b> 4 equal sides</p>	<p><b>Kite</b> 2 pairs of adjacent equal sides</p>
<p><b>Trapezium</b> 1 pair of parallel sides</p>	<p><b>Parallelogram</b> 2 pairs of parallel sides</p>

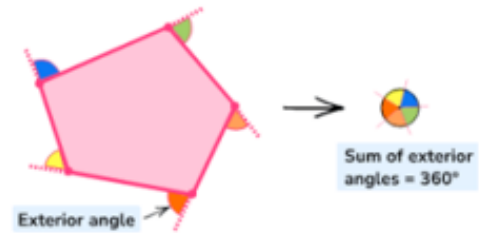
## 4. Polygons

Regular- all sides and angles are equal

Irregular- different side lengths, different angles

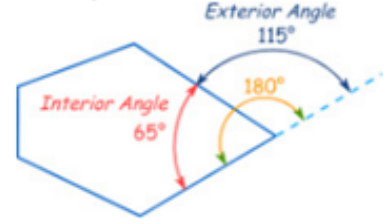


## 5. Exterior Angles in Polygons



## 6. Interior Angles in Polygons

Interior angles and exterior angles are on a straight line. Meaning that they sum to  $180^\circ$



## 7. Interior Angles in Polygons

n is the number of sides which the shape has.

$$\text{sum} = (n - 2) \times 180^\circ$$



# Year 9 Mathematics Learning Cycle 3 Knowledge Organiser – Solving Linear Equations

## 1. Function Machines

An input value becomes an output value when the operations of a function machine are worked through from left to right.

An input value can be found from the output when the inverse operations are worked through from right to left.



## 2. Solving Two-Step Equations

$$\begin{array}{l} +24 \\ \div 10 \end{array} \left| \begin{array}{l} 10x - 24 = 82 \\ 10x = 106 \\ x = 10.6 \end{array} \right. \begin{array}{l} +24 \\ \div 10 \end{array}$$

## 3. Solving Equations with Unknowns on the Denominator

$$\begin{array}{l} +2 \\ \times y \\ \div 9 \end{array} \left| \begin{array}{l} \frac{108}{y} - 2 = 7 \\ \frac{108}{y} = 9 \\ 108 = 9y \\ 12 = y \end{array} \right. \begin{array}{l} +2 \\ \times y \\ \div 9 \end{array}$$

## 4. Solving Equations with Brackets

Expand the brackets first!

$$\begin{array}{l} +4 \\ \div 4 \end{array} \left| \begin{array}{l} 4(x-1) = 12 \\ 4x - 4 = 12 \\ 4x - 4 + 4 = 12 + 4 \\ 4x = 16 \\ 4x = \frac{16}{4} \\ x = 4 \end{array} \right. \begin{array}{l} +4 \\ \div 4 \end{array}$$

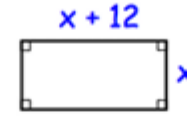
## 5. Solving Equations with Unknowns on Both Sides

Subtract the smaller quantity of  $x$ 's first!

$$\begin{array}{l} -2y \\ +21 \\ \div 6 \end{array} \left| \begin{array}{l} 2y + 9 = 8y - 21 \\ 2y + 9 - 2y = 8y - 21 - 2y \\ 9 = 6y - 21 \\ 30 = 6y \\ 5 = y \end{array} \right. \begin{array}{l} -2y \\ +21 \\ \div 6 \end{array}$$

## 6. Forming Equations with Shapes

Perimeter = 56cm



$$x + x + 12 + x + x + 12 = 56$$

$$4x + 24 = 56$$

## 7. Forming Equations with Words

Problem:

I think of a number.

I multiply the number by 3 and then add 5.

The answer is 29.

Equation:

$$3x + 5 = 29$$

# Year 9 Mathematics Learning Cycle 3 Knowledge Organiser – Probability

## 1. Basic Probability



## 2. And, Or and Not Rules

$$P(A) = \frac{\text{Number of favorable outcomes to A}}{\text{Total number of possible outcomes}}$$

Twirling a spinner



$$P(\text{blue}) = \frac{\text{number of blue sectors}}{\text{total number of sectors}}$$

$$P(\text{blue}) = \frac{2}{3}$$

AND Rule:

If A and B are independent, then  $P(A \text{ and } B) = P(A) \times P(B)$ .

OR Rule:

If A and B are mutually exclusive, then  $P(A \text{ or } B) = P(A) + P(B)$ .

NOT Rule:

Probabilities add up to 1. Therefore,  $P(A') = 1 - P(A)$ , where A' is the event of A not happening.

## 3. Sample Spaces

Sample spaces show the outcomes of events involving two things.

For example, if a dice is rolled and a coin is tossed, the sample spaces diagram would be the following.

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

## 4. Expected Outcomes

To find the expected outcomes, multiply the probability by the number of trials.

For example:

$$\begin{aligned} \text{Expected number of heads} &= P(\text{head}) \times \text{number of flips} \\ &= 0.5 \times 40 \\ &= 20 \end{aligned}$$

## 5. Listing Outcomes

Taking a logical and organised approach will make sure that all the outcomes are found. Just using the first letter of words, eg B for 'blue' can make listing faster.

To work out the total number of outcomes use the product rule: Multiply the number of outcomes for each event.

For example, the diagram below shows 6 outcomes, which is  $2 \times 3$ .

Outcomes

Raspberries and cherries RC  
Raspberries and apples RA  
Raspberries and strawberries RS  
Blueberries and cherries BC  
Blueberries and apples BA  
Blueberries and strawberries BS

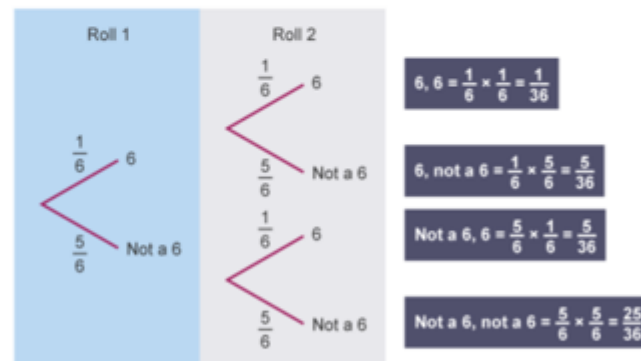


$$\begin{aligned} P(\text{both berries}) &= \frac{2}{6} \\ &= \frac{1}{3} \end{aligned}$$

## 6. Tree Diagrams with Independent Events (H)

Multiply along the branches.

Add the resulting probabilities.



In this case,  $P(\text{at least one } 6) = \frac{1}{36} + \frac{5}{36} + \frac{5}{36} = \frac{11}{36}$ .

# Year 9 Mathematics Learning Cycle 3 Knowledge Organiser – Percentages

## 1. Converting FDP

Decimals and Percentages:  
Percentage = Decimal  $\times$  100  
Decimal = Percentage  $\div$  100

Convert **60%** to a decimal

$$60\% = 60 \div 100 = 0.6$$

So **60%** = **0.6**

Fractions and Percentages:  
Per cent means "out of 100".

$$36\% = \frac{36}{100}$$
$$\frac{36 \div 4}{100 \div 4} = \frac{9}{25}$$

Fractions and Decimals:  
Use short division.

$$\frac{3}{5} = 3 \div 5$$

$$5 \overline{) 3.00}$$

$$\frac{3}{5} = 0.6$$

## 2. Percentage of Amounts

Without a calculator, find simple percentages and build up.

65% of 360

$$65\% = 50\% + 10\% + 5\%$$

With a calculator:

- Type the percentage >
- Use the percentage button (shift>ANS)
- "x"
- Quantity

## 3. Percentage Increase and Decrease

Increase 60 by 20%

$$100\% = 60$$

$$20\% = 12$$

$$60 + 12 = 72$$

## 4. Reversed Percentages

John pays £60 for a bag after getting 20% discount. How much did it originally cost?

*Remember: Original price is always equal to 100%*

$$\text{Sale price} = 100\% - 20\% = 80\%$$



## 5. Percentage Change

Percentage change is calculated by dividing the difference between the two amounts by the original amount.

For example, the number of customers that a food truck receives for lunch drops from 25 to 18 over two days. What is the percentage loss in customers?

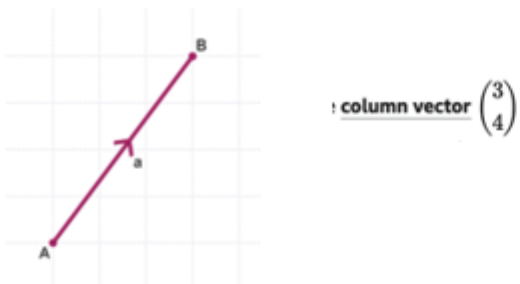
$$\text{Difference} = 25 - 18 = 7$$

$$\text{Percentage change} = \frac{7}{25} \times 100 = 28\%$$

# Year 9 Mathematics Learning Cycle 3 Knowledge Organiser – Transformations

## 1. Vectors

direction  $\bullet$  and magnitude  $\bullet$  (size).



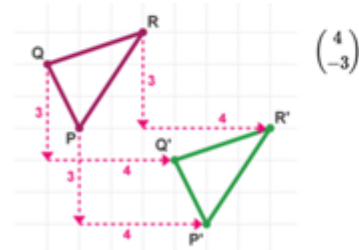
## 2. Translations

A translation moves a shape up, down or from side to side but it does not change its appearance in any other way.

Column vectors  $\bullet$  are used to describe translations.

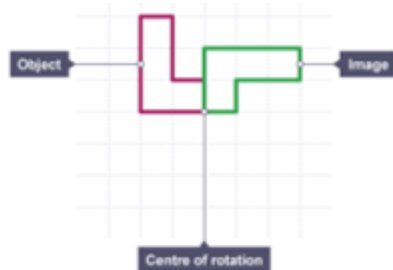
$\begin{pmatrix} 4 \\ -3 \end{pmatrix}$  means translate the shape 4 squares to the right and 3 squares down.

$\begin{pmatrix} -2 \\ 1 \end{pmatrix}$  means translate the shape 2 squares to the left and 1 square up.



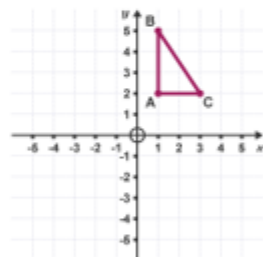
## 3. Rotations

**Rotation** turns a shape around a fixed point called the **centre of rotation**.

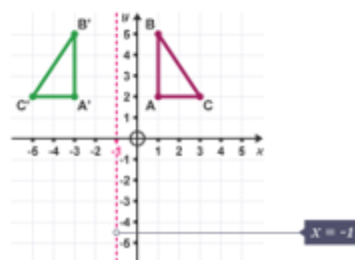


## 4. Reflections

Reflect the shape in the line  $x = -1$ .



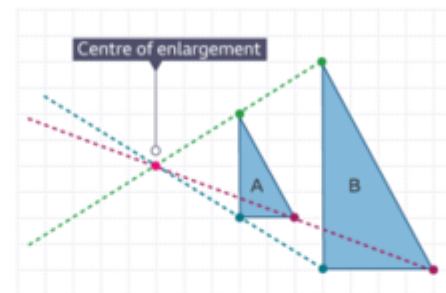
The line  $x = -1$  is a vertical line which passes through  $-1$  on the  $x$ -axis.



## 5. Enlargements

Two pieces of information are needed to enlarge a shape:

- the scale factor
- the centre of enlargement



If the scale factor is positive, the image is bigger than the original shape.

If the scale factor is between 0 and 1, the image is smaller than the original shape.

## 6. Describing Transformations

To describe a translation, you need the vector.

To describe a rotation, you need the angle, direction and centre of rotation.

To describe a reflection, you need the equation of the mirror line.

To describe an enlargement, you need the scale factor and centre of enlargement.

# Year 9 Science Learning Cycle 3 Knowledge Organiser

## How can I use the Periodic Table?

**Group 1 – Alkali Metals**

Group number – tells you the number of electrons in an elements **outer** shell.

Elements in the same group have **similar properties**.

**Group 7 – Halogens**

**Group 0 – Noble gases**

**Mass Number** = number of protons and neutrons added together.

**Atomic / Proton Number** = number of protons which is the same as the number of electrons.

**Neutrons** = Mass number – Atomic number

**Transition Metals**

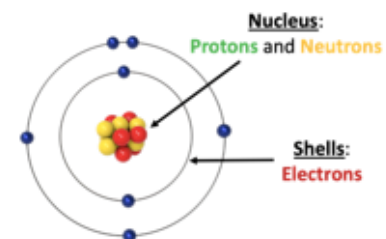
**Non-Metals**

Noble gases have a **full outer shell** of electrons. E.g., Neon (Ne)

Magnesium (Mg) has 12 electrons in total. It is in **group 2** so has 2 electrons in its **outer shell**. Mg's electronic configuration is 2,8,2.

7 <b>Li</b> lithium 3	9 <b>Be</b> beryllium 4											11 <b>B</b> boron 5	12 <b>C</b> carbon 6	14 <b>N</b> nitrogen 7	16 <b>O</b> oxygen 8	19 <b>F</b> fluorine 9	20 <b>Ne</b> neon 10
23 <b>Na</b> sodium 11	24 <b>Mg</b> magnesium 12	<b>Transition Metals</b>										27 <b>Al</b> aluminium 13	28 <b>Si</b> silicon 14	31 <b>P</b> phosphorus 15	32 <b>S</b> sulfur 16	35.5 <b>Cl</b> chlorine 17	40 <b>Ar</b> argon 18
39 <b>K</b> potassium 19	40 <b>Ca</b> calcium 20	45 <b>Sc</b> scandium 21	48 <b>Ti</b> titanium 22	51 <b>V</b> vanadium 23	52 <b>Cr</b> chromium 24	55 <b>Mn</b> manganese 25	56 <b>Fe</b> iron 26	59 <b>Co</b> cobalt 27	59 <b>Ni</b> nickel 28	63.5 <b>Cu</b> copper 29	65 <b>Zn</b> zinc 30	70 <b>Ga</b> gallium 31	73 <b>Ge</b> germanium 32	75 <b>As</b> arsenic 33	79 <b>Se</b> selenium 34	80 <b>Br</b> bromine 35	84 <b>Kr</b> krypton 36
85 <b>Rb</b> rubidium 37	88 <b>Sr</b> strontium 38	89 <b>Y</b> yttrium 39	91 <b>Zr</b> zirconium 40	93 <b>Nb</b> niobium 41	96 <b>Mo</b> molybdenum 42	[97] <b>Tc</b> technetium 43	101 <b>Ru</b> ruthenium 44	103 <b>Rh</b> rhodium 45	106 <b>Pd</b> palladium 46	108 <b>Ag</b> silver 47	112 <b>Cd</b> cadmium 48	115 <b>In</b> indium 49	119 <b>Sn</b> tin 50	122 <b>Sb</b> antimony 51	128 <b>Te</b> tellurium 52	127 <b>I</b> iodine 53	131 <b>Xe</b> xenon 54
133 <b>Cs</b> caesium 55	137 <b>Ba</b> barium 56	139 <b>La*</b> lanthanum 57	178 <b>Hf</b> hafnium 72	181 <b>Ta</b> tantalum 73	184 <b>W</b> tungsten 74	186 <b>Re</b> rhenium 75	190 <b>Os</b> osmium 76	192 <b>Ir</b> iridium 77	195 <b>Pt</b> platinum 78	197 <b>Au</b> gold 79	201 <b>Hg</b> mercury 80	204 <b>Tl</b> thallium 81	207 <b>Pb</b> lead 82	209 <b>Bi</b> bismuth 83	[209] <b>Po</b> polonium 84	[210] <b>At</b> astatine 85	[222] <b>Rn</b> radon 86
[223] <b>Fr</b> francium 87	[226] <b>Ra</b> radium 88	[227] <b>Ac*</b> actinium 89	[267] <b>Rf</b> rutherfordium 104	[270] <b>Db</b> dubnium 105	[269] <b>Sg</b> seaborgium 106	[270] <b>Bh</b> bohrium 107	[270] <b>Hs</b> hassium 108	[278] <b>Mt</b> meitnerium 109	[281] <b>Ds</b> darmstadtium 110	[281] <b>Rg</b> roentgenium 111	[285] <b>Cn</b> copernicium 112	[286] <b>Nh</b> nihonium 113	[289] <b>Fl</b> flerovium 114	[289] <b>Mc</b> moscovium 115	[293] <b>Lv</b> livermorium 116	[293] <b>Ts</b> tennessine 117	[294] <b>Og</b> oganesson 118

Subatomic Particle	Mass	Charge
Proton	1	+1
Neutron	1	0
Electron	Negligible	-1





# Year 9 Science Learning Cycle 3 Knowledge Organiser

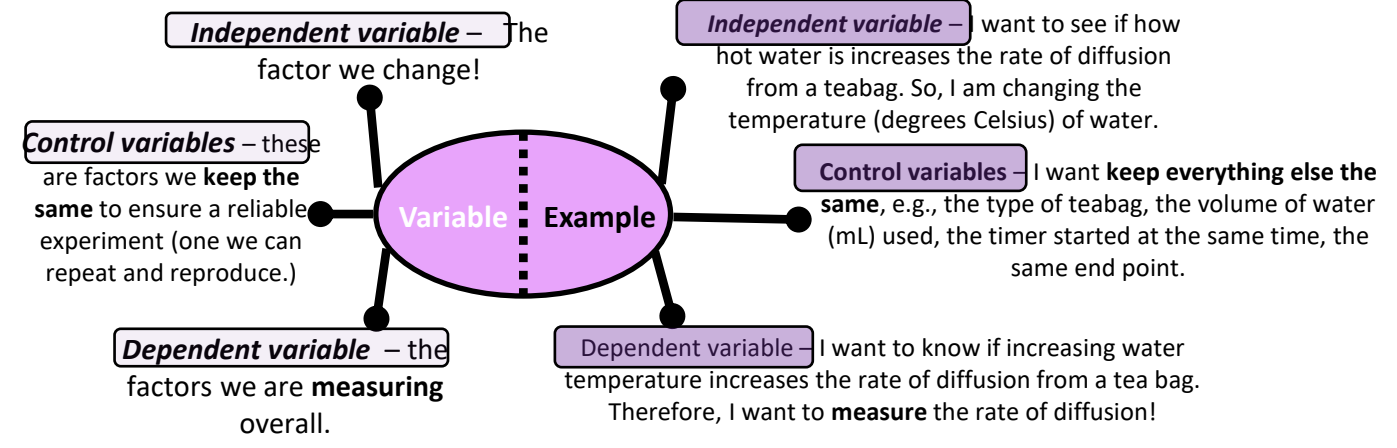
1. Key words	Definition
<b>Independent variable</b>	The variable you change in an investigation
<b>Dependent variable</b>	The variable you measure in an investigation
<b>Control variable</b>	The variable you keep the same in an investigation
<b>Hypothesis</b>	A prediction of what will happen in an investigation
<b>Reliability</b>	We use control variables to ensure a reliable experiment
<b>Reproducible</b>	To re-do our experiment and get similar results due to a reliable method
<b>Mean</b>	Doing an experiment 3 times then dividing by 3 to get an average
<b>Fair test</b>	An experiment where only the independent variable changes.
<b>Anomalous result</b>	Result that does not fit with the rest of the data.

## 2. Designing and performing experiments

- Repeatable** – The **same** person gets the **same results** after repeating the experiment using the same method and equipment.
- Reproducible** – Similar results can be achieved by **someone else** or using a **different method/piece of equipment**.
- Accurate** – Results are close to the true answer
- Precise** – data is **close** to the **mean** (or the average!)

For data to be **reliable**, it must be **repeatable and reproducible**

## 3. The Variables



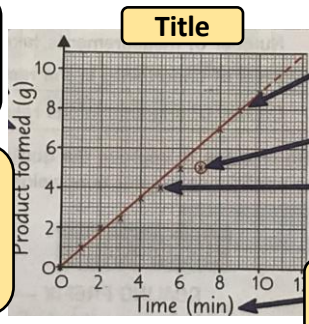
## 4. Presenting Data



- Scale** – evenly spread
- Plot** – draw with a small, neat 'x'
- Line of best fit**
- Axis** – both X (bottom) and Y (side) axis have titles and units!
- Title**

**Axis:** Dependent variable on Y-axis with unit.

**We must always draw a graph with a pencil using a ruler!**



**Line:** Line of best fit through near to as many points as possible.

**Plot:** Mark points with small, neat crosses

**Axis:** Independent variable in the X-axis with unit.

### Drawing conclusions from data:

- State the **relationship** between the independent and dependent variable, e.g., 'as the time increases the product formed increases.'
- Use **statistics to support your answer**. 'For example, at 10 minutes there was 50g of product, compared to 160g at 20 minutes'
- Refer to the original hypothesis – does the data support this?

When **evaluating** think of the **positives** and **negatives** of the method (the validity - did they use enough controls? And of the results – were results **reliable, accurate, reproducible?**) and come to an overall **conclusion**.

# Year 9 Science Learning Cycle 3 Knowledge Organiser – Our changing planet

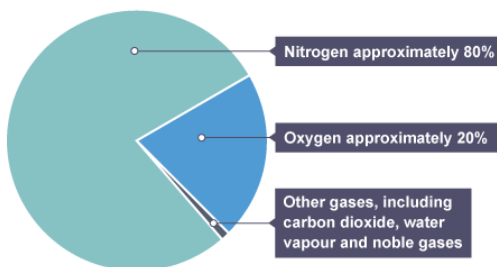
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Key words	Definition
<b>Atmosphere</b>	The envelope of gases which surrounds a planet
<b>Abundant</b>	Most common
<b>Greenhouse effect</b>	the process through which heat is trapped near Earth's surface by substances known as greenhouse gases
<b>Global warming</b>	The rise in the average temperature of Earth's atmosphere and oceans
<b>Fossil fuel</b>	Coal, oil and natural gas. An energy-dense fuel made from the pressurized remains of ancient organisms
<b>Incomplete combustion</b>	Burning fuels in the presence of insufficient (not enough) oxygen
<b>Complete combustion</b>	Burning fuels in the presence of sufficient (enough) oxygen Fuel + oxygen → carbon dioxide + water
<b>Sustainability</b>	Using resources in a way which meets the needs of the present generation, without negatively affecting future generations
<b>Carbon footprint</b>	The volume of carbon dioxide released into the atmosphere during the life-cycle of a product, service or event
<b>Atmospheric pollutant</b>	Contamination of the air by a chemical, physical or biological agent which can cause harm
<b>Polymer</b>	A very long molecule, made of individual subunits called monomers

# Year 9 Science Learning Cycle 3 Knowledge Organiser – Our changing planet

## 2 Earth's atmosphere

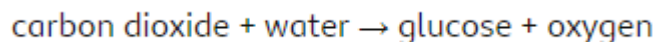
The Earth formed approximately 4.6 billion years ago. In this time, the atmosphere was mostly carbon dioxide and water vapour. There was no oxygen.



Earth's modern atmosphere is mostly nitrogen and oxygen.

## 3 Development of Earth's atmosphere

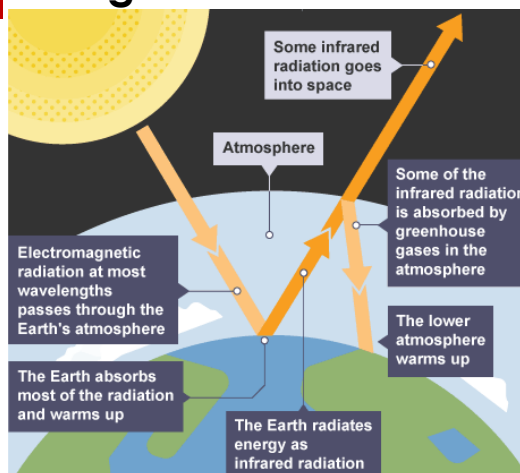
Oxygen increased because algae and plants evolved. They carry out photosynthesis.



Carbon dioxide decreased because it:

1. Dissolved in the oceans to form limestone and shells
2. Was absorbed by plants for photosynthesis
3. Was locked away as fossil fuels: coal, oil and natural gas

## 3 The greenhouse effect



## 4 Atmospheric pollutants

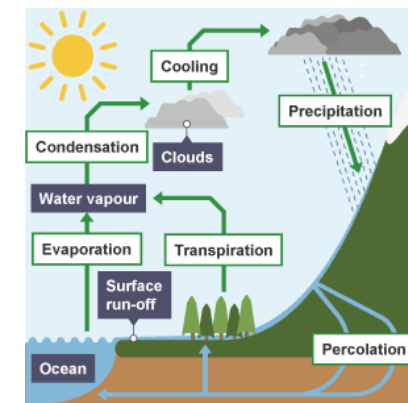
Pollutant	Source	Effects
Carbon monoxide (CO)	Incomplete combustion of fuels	Toxic gas
Carbon particulates		Respiratory issues; global dimming
Nitrogen oxides (NOx)	Nitrogen and oxygen react at very high temperatures in engines	Respiratory issues
Sulphur dioxide (SO <sub>2</sub> )	Sulphur impurities in fuels react with oxygen	Acid rain: damages buildings, reduces biodiversity, acidifies waterways

## 5 Gas tests

Test	Observation	Inference
Glowing splint held in a test tube	Splint relights	Oxygen is present
Lighted splint held in a test tube	Pop sound heard	Hydrogen is present
Gas bubbled through limewater	Limewater turns milky or cloudy white	Carbon dioxide is present
Damp litmus paper held in a test tube	Paper turns white	Chlorine is present

## 6 The water cycle

Water is a key compound for life on Earth. All living organisms need water. Water is constantly cycled.



## 7 Further reading and websites

<https://www.bbc.co.uk/bitesize/topics/zysvv9g>  
Everything you need to know about chemistry of the atmosphere.

<https://www.bbc.co.uk/bitesize/guides/zswfxfr/revision/1>  
Everything you need to know about using Earth's resources sustainably



# Year 9 Science Learning Cycle 3 Knowledge Organiser – Energy resources

1

Key words	Definition
<b>Direct current</b>	A direct current flows in only one direction.
<b>Alternating current</b>	An alternating current regularly changes direction.
<b>The national grid</b>	A network of cables and transformers which transport electricity from where it is produced to where it is consumed
<b>Step-up transformer</b>	Increases potential difference and decreases current
<b>Step-down transformer</b>	Decreases potential difference and increases current
<b>Renewable resources</b>	A resource which is replenished at a greater rate than it is being used
<b>Finite resources</b>	A resource which is used at a greater rate than it is being replenished
<b>Live wire</b>	Coated in brown plastic; carries the 230V alternating current from the power supply
<b>Neutral wire</b>	Coated in blue plastic; completes the circuit from the appliance back to the supply. Potential difference is 0V
<b>Earth wire</b>	Coated in yellow and green stripes; a safety feature providing a path for the current to flow from the device to the ground if there is a fault.
<b>Energy demand</b>	How much energy is required at a given time

# Year 9 Science Learning Cycle 3 Knowledge Organiser – Energy resources

**2 Mains electricity**

Direct current (DC)

Alternating current (AC)

Frequency: 50Hz

Potential difference: 230V

**3 Transporting electricity**

A network of cables and transformers which transport electricity from where it is produced to where it is consumed.

**4 Energy resources – limitations and advantages**

Energy	Energy store	Renewable or non-renewable	Impact on environment
Fossil fuels (oil, coal and natural gases)	Chemical	Non-renewable	Releases CO <sub>2</sub> (causes global warming)
Nuclear fuels	Nuclear	Non-renewable	Radioactive waste (needs to be disposed of safely)
Wind	Kinetic	Renewable	Take up large areas that could be used for farming, people say windmills spoil their view

**5 Energy resources**

A renewable resource is being replenished at a greater rate than it is being used.

A finite resource is being used at a greater rate than it is being replenished

**6 Useful equations**

energy = power × time

$$E = P \times t$$

power = potential difference × current

$$P = V \times I$$

power = current<sup>2</sup> × resistance

$$P = I^2 \times R$$

- energy (*E*) is measured in joules (J)
- power (*P*) is measured in watts (W)
- time (*t*) is measured in seconds (s)
- current (*I*) is measured in amps (A)
- resistance (*R*) is measured in ohms (Ω)
- potential difference (*V*) is measured in volts (V)

**7 Further reading and websites**

<https://www.bbc.co.uk/bitesize/guides/zw8n2nb/revision/1> Everything you need to know about mains electricity and transporting electricity

<https://www.bbc.co.uk/bitesize/guides/z2wfxfr/revision/1> Everything you need to know about energy resources and their limitations

# Year 9 Science Learning Cycle 3 Knowledge Organiser

## How to approach 6 mark questions in Science – Our changing planet

<b>Qu</b>	Identify and explain the changes that have occurred since the Earth's early atmosphere.
<b>Info</b>	<p>This question (or part of it) is a frequent long response question found on a Chemistry Paper 2. The examiner may provide charts or diagrams to interpret as part of the question. You may need to use the data they give; however, this question will mostly be looking for you to apply your knowledge.</p> <p><b>Examples of questions in the past include:</b></p> <ol style="list-style-type: none"> <li>Describe and explain how the atmosphere today is different from the atmosphere of billions of years ago.</li> <li>Describe and explain how the surface of the early Earth and its atmosphere have changed to form the surface of the Earth and its atmosphere today.</li> <li>Explain what has happened to most of the water vapour in the Earth's early atmosphere.</li> <li>Describe how the evolution of plants changed the Earth's atmosphere.</li> <li>Describe <b>two</b> processes which reduced the proportion of carbon dioxide in the Earth's atmosphere over the period of three billion years.</li> <li>Suggest what has caused the main gases in the Earth's atmosphere of millions of years ago to change to the present-day atmosphere.</li> </ol>
<b>Top Tip</b>	Use a clear structure in your answer. Identify a gas in the Earth's early atmosphere, identify if there is now more or less in the atmosphere and explain why. Repeat this for each gas.
<b>Model Answer</b>	<p><b>Describe and explain how the atmosphere today is different from the atmosphere of billions of years ago.</b></p> <p><i>In today's atmosphere there is less carbon dioxide. This is because it has been absorbed by plants during photosynthesis and become locked in fossil fuels. It has also dissolved into oceans and become locked in rocks.</i></p> <p><i>Today there is much more oxygen in the atmosphere. This is because when plants evolved and started to photosynthesise oxygen was released.</i></p> <p><i>Today there is also much more nitrogen. This has been produced by the decay of organisms and the breakdown of ammonia. Nitrogen is unreactive and so has accumulated over time.</i></p> <p><i>Today there is less water vapour. This is because when the Earth cooled the water vapour condensed and formed oceans.</i></p>

## How to approach 6 mark questions in Science – Energy resources

<b>Topic</b>	P3 Energy Resources
<b>Qu</b>	Evaluate the use of _____ to generate electricity.
<b>Info</b>	<p>You could be asked to evaluate any of the energy resources that you learned about in the topic including including fossil fuels, nuclear, biofuels, wind, solar, hydroelectric, geothermal, wave and tidal.</p> <p><b>Info</b></p> <p>To answer this question, you need to:</p> <ol style="list-style-type: none"> <li>Describe the process used to generate electricity for the energy resource in one clear sentence.</li> <li>Describe the advantages.</li> <li>Describe the disadvantages.</li> </ol>
<b>Top Tip</b>	When discussing the advantages and disadvantages consider the reliability of the energy resource, if it is renewable or not as well as its impact on the environment
<b>Model Answer</b>	<p><b>Evaluate the use of fossil fuels to generate electricity.</b></p> <ol style="list-style-type: none"> <li><i>In a fossil fuel power station, a fuel is burned, this turns water into steam which turns a turbine to generate electricity.</i></li> <li><i>The advantages of a fossil fuel power station include that it has a high energy output and it is a reliable energy source.</i></li> <li><i>The disadvantages of using fossil fuels include that it uses a non-renewable energy resource, and it produces carbon dioxide which is a greenhouse gas.</i></li> </ol>



# What enrichment opportunities can enhance my understanding of Science?

## Science reading opportunities

**Reciprocal Reading**  
**The Fab 5**

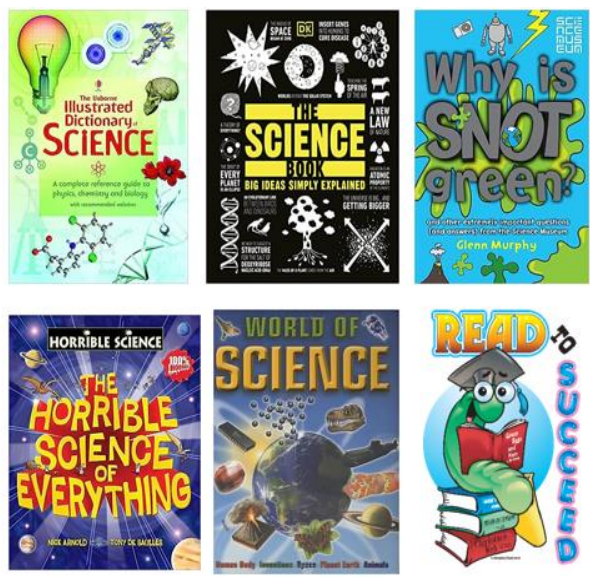
**PREDICT**  
I think... I predict...  
I wonder...  
I imagine... I suppose...

**QUESTION**  
I wonder... Who? What? Where?  
When? Why? How? What if?  
What does?

**CLARIFY**  
I'm not sure of this word... section... image...  
diagram... label...  
what does this mean?  
I think I recognise this word...  
does it link to... can I have help with a synonym...

**TALK THE TEXT**  
Why is this text important?  
How does it link to my learning?  
What key information can I take from the text?

**SUMMARISE**  
Label the key points / Paragraphs...  
bullet point key ideas...  
highlight key words...  
The most important part is...  
next... also... finally...



### Science discovery websites:

- [Spectacular Science \(nationalgeographic.com\)](https://www.nationalgeographic.com)
- [KS3 Science - BBC Bitesize](https://www.bbc.com/bitesize)
- [Science Experiments for Kids - Science Experiments for Kids \(science-sparks.com\)](https://www.science-sparks.com)
- [Discover | Natural History Museum \(nhm.ac.uk\)](https://www.nhm.ac.uk)
- [Cornwall Wildlife Trust | Cornwall Wildlife Trust](https://www.cornwallwildlifetrust.org)
- [Eden at home | Eden Project](https://www.edenproject.com)
- [NASA](https://www.nasa.gov)

## STEM Club (Science, technology, engineering and maths)

**Could you survive a Zombie Apocalypse?**  
**Tuesday 3.15pm in S3 with Mr Stone**

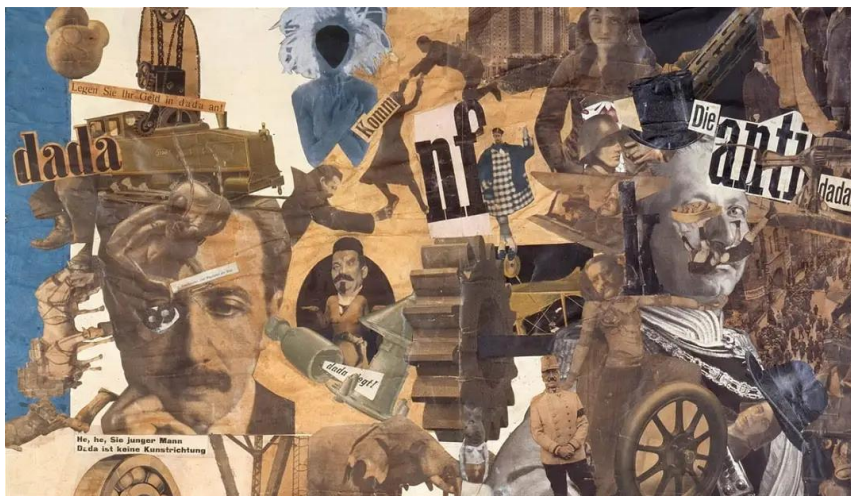
# Year 9 Art Learning Cycle 3 Knowledge Organiser – Art in the News

Key Terms	Definitions
Propaganda	An image that is designed to change people's perception, ideas or opinion about a situation.
Visual Brainstorm	Unpicking imagery from text using drawings rather than words.
Political Cartoon	Cartoon like illustration that makes comment on a current political story.
Ink	Vibrant liquid used by artists for its spontaneous qualities.
Idea Development	Drawings, plan, ideas for the final outcome. This will be refined through experimentation of materials.
Contextualisation	The message, meaning or story behind the idea.
Resource Materials	Images from newspapers, magazines, internet or photographs that are collected to develop ideas from.

## What do I need to know?

How to select and present information to develop ideas.  
How to empathise with different people and situations.

Obama Campaign poster 2008.  
Sheperd Fairey



*Cut with a Kitchen Knife 1919. Hannah Hoch*

**What will I learn?** You will look at the link between politics, news, social, cultural and environmental issues and ideas. You will select an issue to inform your idea and through research you will develop a response, this is contextualisation. You will look at artists and techniques to extend and develop your knowledge. The key skill for this project is **CONTEXTUALISATION**. You will learn what this is and then use it to develop a high-quality final outcome.



*Colston Statue: Banksy*

# Year 9 Computing Learning Cycle 3 Knowledge Organiser – Networks

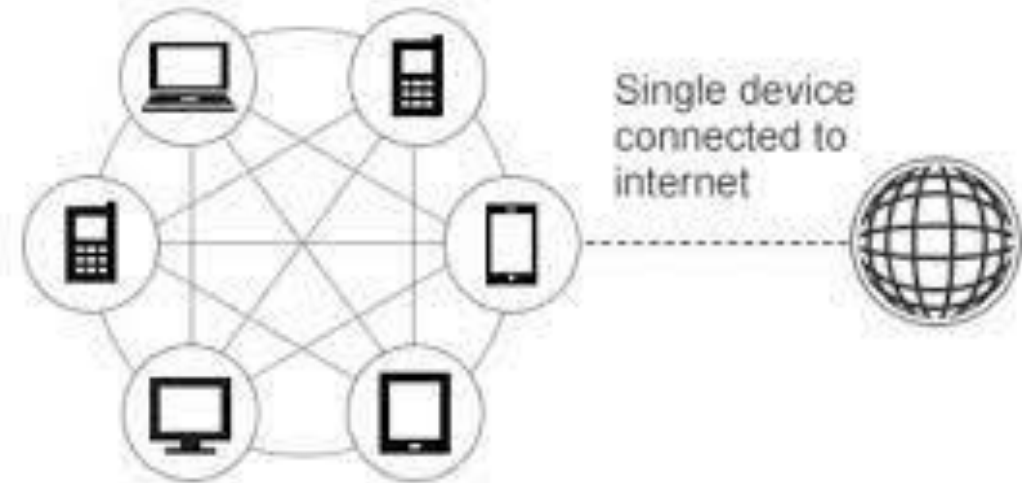
Key Words	Definitions
Network	A group of connected computers or devices
Internet	A global network of computers. All computer devices (including PCs, laptops, games consoles and smartphones) that are connected to the internet form part of this network.
Websites	Websites consist of webpages which allow you to see information. Websites are accessed using a web browser.
World Wide Web (WWW)	The part of the internet that can be accessed through websites.

**WAN** – Wide Area Network (eg. the internet)

**LAN** – Local Area Network (eg. The school)

**PAN** – Personal area Network (eg Bluetooth)

Mesh network





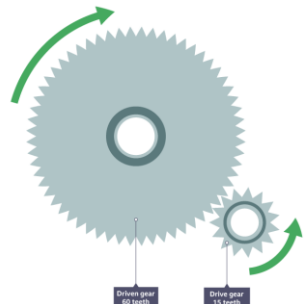
# Year 9 Computing Learning Cycle 3 Knowledge Organiser –HTML

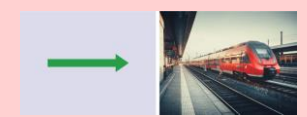
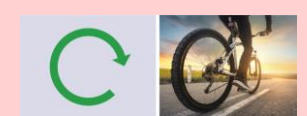


1 Using HTML	
HTML	<p>HyperText Markup Language. The language used to write and display web page documents.</p> <p>HTML can be written with specialist software or using a text editor, but must be saved with the extension .html</p> <p>This is an example of html</p> <pre>&lt;html&gt;   &lt;body&gt;     &lt;h1&gt;Hello world&lt;/h1&gt;     &lt;p&gt;This is my first webpage &lt;/p&gt;   &lt;/body&gt; &lt;/html&gt;</pre>
HTTP	Hypertext Transfer Protocol - a request/response standard. Web browsers send requests and websites or servers respond to requests.
Hyperlink	A link in a document or webpage that connects to another location
Network	A group of interconnected computers/devices.
Internet	A global, partial mesh network
WAN	Wide area network

2 CSS	
<p><b>Cascading Style Sheets</b></p> <p>Cascading Style Sheets (CSS) can be used to style web pages. While HTML tells the browser what to display on a page, CSS tells the browser how to display it. CSS rules can be added to already existing HTML files.</p>	
<p>A CSS rule set consists of:</p> <ul style="list-style-type: none"> <li>a selector – what the rule is for</li> <li>a declaration block – what the rule will do</li> </ul>	
Change background colour of the body to ivory	body { background-color:ivory;}
Set the format of the header to blue	h1 { color: blue; font-size: 12px;}
paragraph	<p>This is a paragraph.</p>

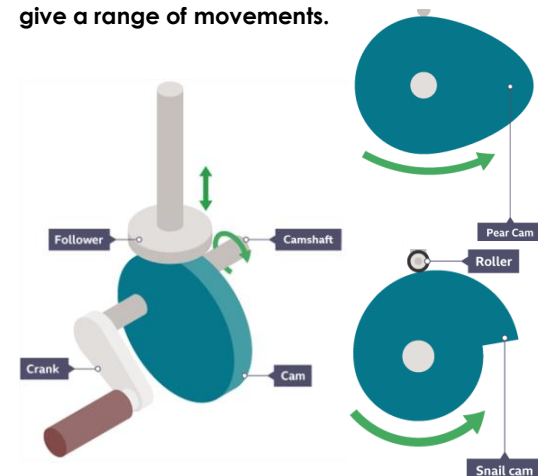
# Year 9 Design Technology Learning Cycle 3 Knowledge Organiser – Mechanical Systems




1 TIER THREE VOCABULARY	
<b>Crank</b>	An arm attached at 90 degrees to the end of a rotating shaft
<b>Cam</b>	A wheel attached to a shaft
<b>Follower</b>	A bar that follows a cam around its circumference
<b>Eccentric</b>	Deliberately locating a cam off-centre so that it makes a follower rise and fall as the cam rotates
<b>Shaft</b>	A rod connecting moving parts of a mechanical system together
<b>Gear</b>	A wheel with teeth that can change the speed of a mechanism
<b>Drive Gear</b>	The starting gear that is moved to cause all other movement
<b>Driven Gear</b>	A gear that transfers motion from the drive gear
<b>Input Motion</b>	The type of movement that is put into a mechanical system
<b>Output Motion</b>	The type of movement that comes out of a mechanical system
<b>Torque</b>	The force generated or needed to cause an object to rotate

4 USING GEARS	
 <p>One complete turn of the large gear will cause the smaller gear to rotate many more times and at a faster speed.</p> <p>We call this difference in speed the gear ratio.</p>	

2 TYPES OF MOVEMENTS	
<b>Linear</b> 	Linear motion moves something in a straight line. For example - a train moving down a track
<b>Rotary</b> 	Rotary motion is where something moves around an axis or pivot point. For example - a wheel
<b>Reciprocating</b> 	Reciprocating motion has a repeated up and down motion or back-and-forth motion. For example - a piston or pump
<b>Oscillating</b> 	Oscillating motion has a curved backwards and forwards movement that swings on an axis or pivot point. For example - a swing or a clock pendulum

5 WORKSHOP SAFETY	
<ol style="list-style-type: none"> <li>1) Always wear goggles when using machine tools and remember that work must be clamped securely before drilling.</li> <li>2) Do not use a tool unless your teacher has shown you how to use the tool safely. Ask to be shown again if you have forgotten how to use the tool safely.</li> <li>3) Using gear systems can increase the speed and power of rotating objects. Winding the crankshaft of a geared system can cause the driven gear to rotate much faster. Ensure that anything attached to the driven gear is secure and that your fingers are not going to get hit/trapped.</li> </ol>	

3 CAMS AND FOLLOWERS	
Cams can be made in a range of shapes to give a range of movements.	
	


6 LINKS & FURTHER READING	
<b>Types of motion:</b> <a href="https://www.youtube.com/watch?v=U337crT3OC0&amp;t=50s">https://www.youtube.com/watch?v=U337crT3OC0&amp;t=50s</a>	
<b>Cams and Followers:</b> <a href="https://www.youtube.com/watch?v=wTiw2CktpW0&amp;t=27s">https://www.youtube.com/watch?v=wTiw2CktpW0&amp;t=27s</a>	
<b>Revise:</b> <a href="https://www.is.gd/mindmapmaker">is.gd/mindmapmaker</a>	

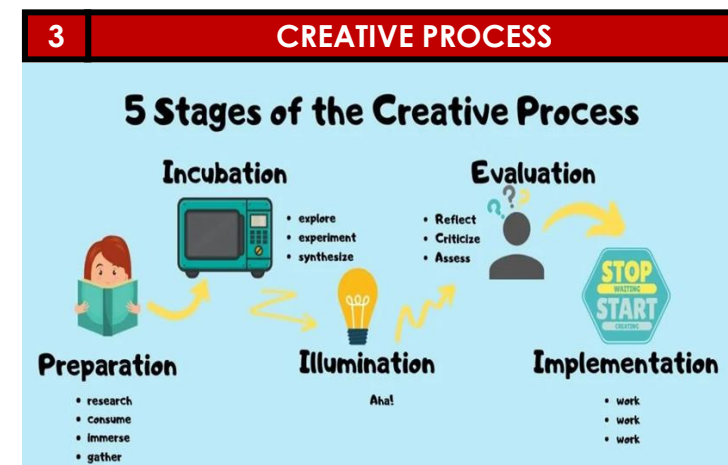


# Year 9 Drama Learning Cycle 3 Knowledge Organiser – Devising Theatre

1	TIER THREE VOCABULARY
<b>Devising</b>	Creating your own theatre from scratch. It could involve improvisation and still images to generate performance material.
<b>Stimulus</b>	Something that inspires the creation of a piece of theatre. This could be – pictures, poems, music, articles, artefacts and paintings.
<b>Improvisation</b>	Making up a performance without rehearsal or planning the narrative or events in advance.
<b>Structure</b>	The order of events in a performance.
<b>Role play</b>	A short scene created by a group of actors.
<b>Still Image</b>	A frozen moment in time to mark a moment.
<b>Cliff hanger</b>	When the events end without a resolution, leaving the audience wondering what is going to happen next.
<b>Unexpected Ending</b>	An ending that catches the audience by surprise.
<b>Tension</b>	A feeling that the story is building up towards something exciting happening.
<b>Split Stage</b>	The stage is split and there are two scenes happening at the same time.
<b>Flashback/ Flashforward</b>	A scene set in a time earlier or later than the main story, added into the narrative to add information.
<b>Theme</b>	A theme is a recurring idea that's present throughout the work.
<b>Target Audience</b>	Who your performance is aimed at.

2	STRUCTURING A PERFORMANCE
	<ol style="list-style-type: none"> <li>1. The exposition – setting the scene</li> <li>2. The encounter – a meeting of some kind</li> <li>3. The conflict or complication – the problem</li> <li>4. The climax – moment of tension – point at which all strands are pulled together</li> <li>5. The resolution – the moment when all the events are resolved</li> </ol>

4	Brecht
	 <p><b>Bertolt Brecht (1898- 1956)</b></p> <p>A German theatre practitioner who was closely linked with the Epic theatre style. He used non naturalistic performance techniques and his performances had a strong political message and were designed to really make the audience think.</p> <p><b>Techniques</b></p> <p><b>Direct address-</b> The actors speak directly to the audience, sometimes in the form of questions. This reminds them that what they are seeing isn't real and forces them to think about what they are watching.</p> <p><b>Multi role-play-</b> The actors play more than one part in a performance.</p> <p><b>Placards-</b> Signs held up to tell the audience the title of the scene and even what was going to happen in them.</p> <p><b>Further Links:</b>  <a href="https://www.youtube.com/watch?v=c7fqMPDcKXM">https://www.youtube.com/watch?v=c7fqMPDcKXM</a></p>



4	LINKS & FURTHER READING
	<p><b>Devising Strategies</b>  <a href="https://www.bbc.co.uk/bitesize/topics/z4vm2sg">https://www.bbc.co.uk/bitesize/topics/z4vm2sg</a></p> <p><b>Building blocks for Devising</b> -<a href="https://www.youtube.com/watch?v=gUqZPfGIX6U">https://www.youtube.com/watch?v=gUqZPfGIX6U</a></p> <p><b>Devising Process National Theatre</b> -  <a href="https://www.youtube.com/watch?v=7mJ02mSvbEM">https://www.youtube.com/watch?v=7mJ02mSvbEM</a></p>

# Year 9 Food and Nutrition Learning Cycle 3 Knowledge Organiser – Dovetail a time plan

1 TIER THREE VOCABULARY	
<b>Dovetail</b>	Dovetailing a time plan allows for a number of dishes to be finished at the same time by planning
<b>Mise-en-place</b>	Preparation of your area prior to cooking such as collecting ingredients, equipment, preparing food handler,
<b>Allergies</b>	A group of foods that cause an allergic reaction to people.
<b>Basal Metabolic Rate (BMR)</b>	The rate at which a person uses energy to maintain the basic functions of the body eg. breathing
<b>Estimated Average Requirement</b>	An estimate of the average requirement of energy or a nutrient needed by a group of people.
<b>Adaptation</b>	Ability to adapt a recipe to improve the dish or meet needs of the customer
<b>Taste Receptors</b>	Our tongues are covered with taste buds, which are designed to sense chemicals in the mouth.
<b>Umami</b>	Savoury taste, often known as the fifth taste.

## 2 Dovetailing for a Time Plan

What is a time plan in food?  
In order to ensure that food is cooked and served promptly good time planning is essential. It involves all the stages and time required to prepare, cook and serve food.

## 3 Food Science

**Dextrinisation**  
When foods containing starch are heated they can also produce brown compounds due to dextrinisation. Dextrinisation occurs when the heat breaks the large starch polysaccharides into smaller molecules known as dextrans which produce a brown colour.

**Caramelisation**  
When sucrose (table sugar) is heated above its melting point it undergoes physical and chemical changes to produce caramel.

**Denaturation**  
Denaturation is the change in structure of protein molecules. The process results in the unfolding of the protein's structure. Factors which contribute to denaturation are heat, salts, pH and mechanical action.

**Coagulation**  
Coagulation follows denaturation. For example, when egg white is cooked it changes colour and becomes firmer (sets). The heat causes egg proteins to unfold from their coiled state and form a solid, stable network.

## 4 Adaptation of recipes

Deciding on what to cook or eat, whether for yourself or someone else, requires making a number of decisions, which may cause you to adapt a recipe, including; beliefs and values; consumer information; food preferences; food provenance; health and wellbeing; social and economic considerations; who, what, when and where.

**Allergy and intolerance**  
There are 14 ingredients (allergens) that are the main reasons for adverse reactions to food. People who are allergic, or intolerant, to these ingredients should take care to avoid eating them. The 14 allergens are:

Celery (and celeriac)	Milk
Cereals containing gluten	Molluscs
Crustaceans	Mustard
Eggs	Nuts
Fish	Peanuts
Lupin	Sesame
	Soybeans
	Sulphur dioxide

## 5 Taste Receptors

A range of senses are used when eating food: sight; smell; hearing; taste; touch. A combination of these senses helps to evaluate a food.

**Taste receptors**  
Sensitivity to all tastes is distributed across the whole tongue (and indeed other regions of the mouth where there are taste buds), but some areas are more responsive to certain tastes than others.

**Sensory evaluation and tests**  
Sensory evaluation analyses and measures human responses to food and drink, e.g. appearance, touch, odour, texture, temperature and taste.

## 6 LINKS & FURTHER READING

**Video: Time plan**  
<https://www.youtube.com/watch?v=oVpeifuR46A>

**Article: Food Allergy and Intolerance**  
<https://www.betterhealth.vic.gov.au/health/conditionsandtreatments/food-allergy-and-intolerance>

**Revise:**  
**Mindmap Maker**  
[is.gd/mindmapmaker](https://www.gd.com/mindmapmaker)

# Year 9 Geography Learning Cycle 3 Knowledge Organiser – Resource Management

### Resource Challenges

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

### Significance of Water

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

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

### Demand outstripping supply

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

1. Population Growth	2. Economic Development
<ul style="list-style-type: none"> <li>Currently the global population is <b>7.3 billion</b>.</li> <li>Global population has risen <b>exponentially</b> this century.</li> <li>Global population is expected to reach <b>9 billion by 2050</b>.</li> <li>With more people, the <b>demand</b> for food, water, energy, jobs and space <b>will increase</b>.</li> </ul>	<ul style="list-style-type: none"> <li>As LICs and NEEs develop further, they require <b>more energy</b> for industry.</li> <li>LICs and NEEs want similar lifestyles to HICs, therefore they will need to <b>consume more resources</b>.</li> <li>Development means <b>more water is required</b> for food production as diets improve.</li> </ul>

### 3. Changing Technology and Employment

- The demand for resources has driven the **need for new technology** to reach or gain more resources.
- More people in the **secondary and tertiary industry** has increased the **demand for resources** required for electronics and robotics.

### Food in the UK

Growing Demand	Impact of Demand
<ul style="list-style-type: none"> <li>The UK imports about 40% of its food. This increases people's <b>carbon footprint</b>.</li> <li>There is growing demand for greater choice of <b>exotic foods</b> needed all year round.</li> <li>Foods from abroad are more affordable.</li> <li>Many food types are unsuitable to be grown in the UK.</li> </ul>	<p><b>Foods can travel long distances (food miles). Importing food adds to our carbon footprint.</b></p> <ul style="list-style-type: none"> <li>+ Supports workers with an income</li> <li>+ Supports families in LICs.</li> <li>+ Taxes from farmers' incomes contribute to local services.</li> <li>- Less land for locals to grow their own food.</li> <li>- Farmers exposed to chemicals.</li> </ul>
Agribusiness	Sustainable Foods
<p>Farming is being treated like a <b>large industrial business. This is increasing food production.</b></p> <ul style="list-style-type: none"> <li>+ Intensive farming maximises the amount of food produced.</li> <li>+ Using machinery which increases the farms efficiency.</li> <li>- Only employs a <b>small number of workers</b>.</li> <li>- Chemicals used on farms damages the habitats and wildlife.</li> </ul>	<p>Organic foods that have little impact on the environment and are healthier have been rising. Local food sourcing is also rising in popularity.</p> <ul style="list-style-type: none"> <li>Reduces emissions by only eating food from the UK.</li> <li>Buying locally sourced food supports local shops and farms.</li> <li>A third of people <b>grow their own food</b>.</li> </ul>

## Unit 2c

# The Challenge of Resource Management

### Energy in the UK

Growing Demand	Energy Mix
The UK consumes <b>less energy</b> than compared to the 1970s despite a smaller population. This is due to the <b>decline of industry</b> .	The majority of UK's energy mix comes from <b>fossil fuels</b> . By 2020, the UK aims for 15% of its energy to come from <b>renewable sources</b> . These renewable sources do not contribute to <b>climate change</b> .
Changes in Energy Mix	

### Water in the UK

Growing Demand	Deficit and Surplus				
<p>The average water used per household has risen by 70%. This growing demand is predicted to increase by 5% by 2020. This is due to:</p> <ul style="list-style-type: none"> <li>A growing UK population.</li> <li>Water-intensive appliances.</li> <li>Showers and baths taken.</li> <li>Industrial and leisure use.</li> <li>Watering greenhouses.</li> </ul>	<p>The north and west have a <b>water surplus</b> (more water than is required). The south and east have a <b>water deficit</b> (more water needed than is actually available). More than half of England is experiencing <b>water stress</b> (where demand exceeds supply).</p>				
Pollution and Quality	Water stress in the UK				
<p>Cause and effects include:</p> <ul style="list-style-type: none"> <li>Chemical run-off from farmland can destroy habitats and kills animals.</li> <li>Oil from boats and ships poisons wildlife.</li> <li>Untreated waste from industries creates unsafe drinking water.</li> <li>Sewage containing bacteria spreads infectious diseases.</li> </ul>					
Management	Water Transfer				
<p>UK has <b>strict laws</b> that limits the amount of discharge from factories and farms. <b>Education campaigns</b> to inform what can be disposed of safely. <b>Waste water treatment plants</b> remove dangerous elements to then be used for safe drinking. Pollution traps catch and filter pollutants.</p>	<p>Water transfer involves moving water through pipes from areas of surplus (Wales) to areas of deficit (London). <b>Opposition includes:</b></p> <ul style="list-style-type: none"> <li>Effects on <b>land and wildlife</b>.</li> <li>High <b>maintenance costs</b>.</li> <li>The <b>amount of energy</b> required to move water over long distances.</li> </ul>				
Energy in the UK (continued)					
Significance of Renewables	Exploitation				
<ul style="list-style-type: none"> <li>+ The UK government is investing more into low carbon alternatives.</li> <li>+ UK government aims to meet targets for reducing emissions.</li> <li>+ Renewable sources include wind, solar and tidal energy.</li> <li>- Although infinite, renewables are still expensive to install.</li> <li>- Shale gas deposits may be exploited in the near future</li> </ul>	<table border="1"> <thead> <tr> <th>Nuclear</th> <th>Wind Farm</th> </tr> </thead> <tbody> <tr> <td> <ul style="list-style-type: none"> <li>New plants provide job opportunities.</li> <li>Problems with safety and possible harm to wildlife.</li> <li>Nuclear plants are expensive.</li> </ul> </td> <td> <ul style="list-style-type: none"> <li>Locals have low energy bills.</li> <li>Reduces carbon footprint.</li> <li>Construction cost is high.</li> <li>Visual impacts on landscape.</li> <li>Noise from wind turbines.</li> </ul> </td> </tr> </tbody> </table>	Nuclear	Wind Farm	<ul style="list-style-type: none"> <li>New plants provide job opportunities.</li> <li>Problems with safety and possible harm to wildlife.</li> <li>Nuclear plants are expensive.</li> </ul>	<ul style="list-style-type: none"> <li>Locals have low energy bills.</li> <li>Reduces carbon footprint.</li> <li>Construction cost is high.</li> <li>Visual impacts on landscape.</li> <li>Noise from wind turbines.</li> </ul>
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# Year 9 Geography Learning Cycle 3 Knowledge Organiser – Resource Management

## Option 1: FOOD



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

### Human



- **Poverty** prevents people affording food and buying equipment.
- **Conflict** disrupts farming and prevents supplies.
- **Food waste** due to poor transport and storage.
- **Climate Change** is affecting rainfall patterns making food production difficult.

### Physical



- The **quality of soil** is important to ensure crops have key nutrients.
- **Water supply** needs to be reliable to allow food to grow.
- **Pest, diseases and parasites** can destroy vast amounts of crops that are necessary to populations.
- **Extreme weather** events can damage crops (i.e. floods).

## Increasing Food Supply



**Hydroponics** - A method of growing plants without soil. Instead they use nutrient solution.

**New Green Revolution** - Aims to improve yields in a more sustainable way. Involves using both GM varieties and traditional and organic farming.

**Biotechnology** - Genetically modified (GM) crops changes the DNA of foods to enhance productivity and properties.

**Irrigation** - Artificially watering the land so crops can grow. Useful in dry areas to make crops more productive.

## Sustainable Food Supply



This ensures that fertile soil, water and environmental resources are available for future generations.

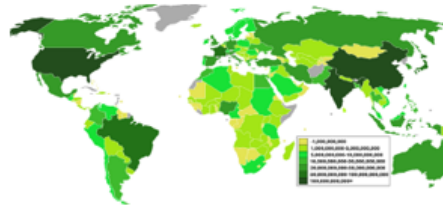
**Organic Farming** - The banned use of chemicals and ensuring animals are raised naturally.

**Permaculture** - People growing their own food and changing eating habits. Fewer resources are required.

**Urban Farming** - Planting crops in urban areas. i.e. roundabouts.

**Managed Fishing** – Includes setting catch limits, banning trawling and promoting pole and line methods.

## Food Supply



This map shows the amount of **food produced** in different countries. Whilst Asia and **North America** have **high** production outputs, **Africa** and **Central America** have **low** production outputs.

## C.S. Thanet Earth



Located in Kent, the site involves four huge greenhouses using hydroponics.

### Advantages

- Supports more than 500 jobs.
- Produces food all year round.
- Provides UK with food security.

### Disadvantages

- Money generated mostly goes to large companies not community.
- Requires a lot of energy.
- Causes visual & light pollution.

## C.S. NEE- Indus Basin Irrigation System



Largest irrigation scheme in the world. Involves large and small dams. Thousands of channels provides water to supports Pakistan's rich farmlands.


### Advantages

- Improves food security by adding 40% more land for farming.
- Increased yield & range of foods.

### Disadvantages

- Few take an unfair share of water
- Water is wasted and demand is rising due to population growth.
- High cost to maintain reservoirs.

# Year 9 Geography Learning Cycle 3 Knowledge Organiser – The Living World

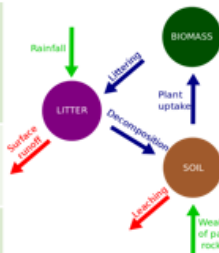
What is an Ecosystem?	
An ecosystem is a system in which organisms interact with each other and with their environment.	
Ecosystem's Components	
Abiotic	These are <b>non-living</b> , such as air, water, heat and rock.
Biotic	These are <b>living</b> , such as plants, insects, and animals.
	<b>Flora</b> Plant life occurring in a particular region or time.
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### Food Web and Chains

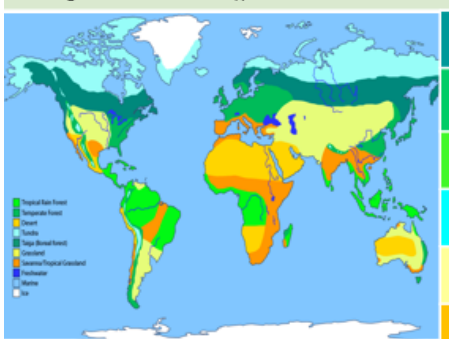
Simple **food chains** are useful in explaining the basic principles behind ecosystems. They show only one species at a particular trophic level. **Food webs** however consists of a network of many food chains interconnected together.

Nutrient cycle	
Plants take in <b>nutrients</b> to build into new organic matter. Nutrients are taken up when animals eat plants and then returned to the soil when animals die and the body is broken down by <b>decomposers</b> .	
<b>Litter</b>	This is the <b>surface layer</b> of vegetation, which over time breaks down to become <b>humus</b> .
<b>Biomass</b>	The total mass of <b>living organisms</b> per unit area.



**Biomes**

A biome is a **large geographical area of distinctive plant and animal groups**, which are adapted to that **particular environment**. The climate and geography of a region determines what type of biome can exist in that region.



Coniferous forest
Deciduous forest
Tropical rainforests
Tundra
Temperate grasslands
Tropical grasslands
Hot deserts.

The **most productive biomes** – which have the greatest biomass- grow in climates that are **hot and wet**.

Biome's climate and plants						
Biome	Location	Temperature	Rainfall	Flora	Fauna	
<b>Tropical rainforest</b>	Centred along the Equator.	Hot all year (25-30°C)	Very high (over 200mm/year)	Tall trees forming a canopy; wide variety of species.	Greatest range of different animal species. Most live in canopy layer	
<b>Tropical grasslands</b>	Between latitudes 5°- 30° north & south of Equator.	Warm all year (20-30°C)	Wet + dry season (500-1500mm/year)	Grasslands with widely spaced trees.	Large hoofed herbivores and carnivores dominate.	
<b>Hot desert</b>	Found along the tropics of Cancer and Capricorn.	Hot by day (over 30°C) Cold by night	Very low (below 300mm/year)	Lack of plants and few species; adapted to drought.	Many animals are small and nocturnal: except for the camel.	
<b>Temperate forest</b>	Between latitudes 40°- 60° north of Equator.	Warm summers + mild winters (5-20°C)	Variable rainfall (500-1500m /year)	Mainly deciduous trees; a variety of species.	Animals adapt to colder and warmer climates. Some migrate.	
<b>Tundra</b>	Far Latitudes of 65° north and south of Equator	Cold winter + cool summers (below 10°C)	Low rainfall (below 500mm/ year)	Small plants grow close to the ground and only in summer.	Low number of species. Most animals found along coast.	
<b>Coral Reefs</b>	Found within 30° north – south of Equator in tropical waters.	Warm water all year round with temperatures of 18°C	Wet + dry seasons. Rainfall varies greatly due to location.	Small range of plant life which includes algae and sea grasses that shelters reef animals.	Dominated by polyps and a diverse range of fish species.	


## Unit 1b The Living World

### Tropical Rainforest Biome

Tropical rainforest cover about **2 per cent** of the Earth's surface yet they are home to **over half of the world's plant and animals**.

### Interdependence in the rainforest

A rainforest works through **interdependence**. This is where the plants and animals **depend on each other** for survival. If one component changes, there can be **serious knock-up effects** for the entire ecosystem.



### CASE STUDY: UK Ecosystem: Epping Forest, Essex

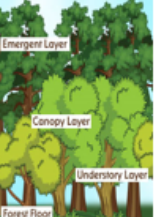
This is a typical English lowland deciduous woodland. **70% of the area** is designated as a **Site of Special Scientific Interest (SSI)** for its biological interest, with **66 %** designated as a **Special Area of Conservation (SAC)**.

Components & Interrelationships		Management
<b>Spring</b>	Flowering plants (producers) such as bluebells store nutrients to be eaten by consumers later.	- Epping has been managed for centuries. - Currently now used for <b>recreation and conservation</b> . - Visitors <b>pick fruit and berries</b> , helping to <b>disperse seeds</b> . - Trees cut down to encourage <b>new growth for timber</b> .
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### Distribution of Tropical Rainforests

Tropical rainforests are **centred along the Equator** between the Tropic of Cancer and Capricorn. Rainforests can be found in South America, central Africa and South-East Asia. **The Amazon** is the world's largest rainforest and takes up the majority of northern South America, encompassing countries such as Brazil and Peru.



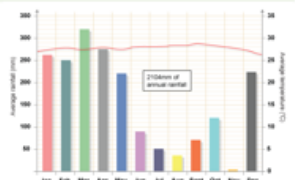
### Layers of the Rainforest

<b>Emergent</b>	Highest layer with trees reaching 50 metres.
<b>Canopy</b>	Most life is found here as it receives <b>70% of the sunlight</b> and <b>80% of the life</b> .
<b>U-Canopy</b>	Consists of trees that reach <b>20 metres high</b> .
<b>Shrub Layer</b>	Lowest layer with <b>small trees</b> that have adapted to living in the <b>shade</b> .


### Rainforest nutrient cycle


The **hot, damp conditions** on the forest floor allow for the **rapid decomposition** of dead plant material. This provides plentiful nutrients that are easily absorbed by plant roots. However, as these nutrients are in high demand from the many fast-growing plants, they do not remain in the soil for long and stay close to the surface. If vegetation is removed, the soils quickly become **infertile**.

- ### Climate of Tropical Rainforests
- Evening temperatures rarely fall below **22°C**.
  - Due to the **presence of clouds**, temperatures rarely rise above **32°C**.
  - Most afternoons have heavy showers.
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# Year 9 Geography Learning Cycle 3 Knowledge Organiser – The Living World

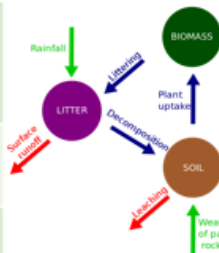
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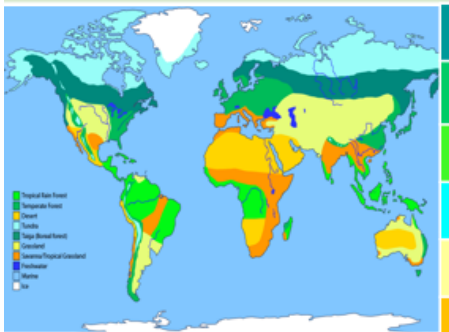
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## Unit 1b The Living World

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# Year 9 History Learning Cycle 3 Knowledge Organiser

Enquiry Question: How have crimes and punishments changed over time?

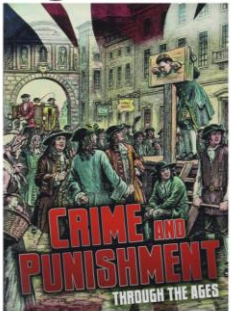
Historical Skills we will develop in this enquiry:

- Our understanding of change and continuity
- Our understanding of using sources

Bringing the past back to life at Poltair!

## Reading like a historian

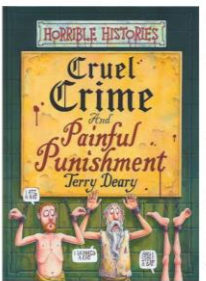
**Aspects of British History Beyond 1066: Crime and Punishment Through the Ages**  
**Ben Hubbard (Author)**



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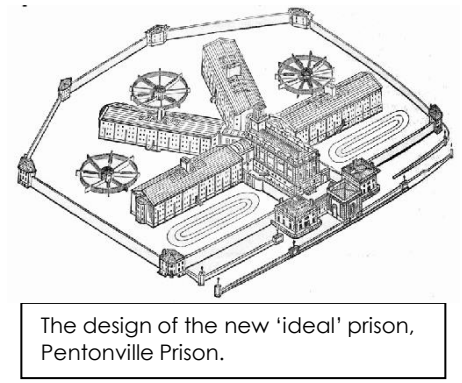
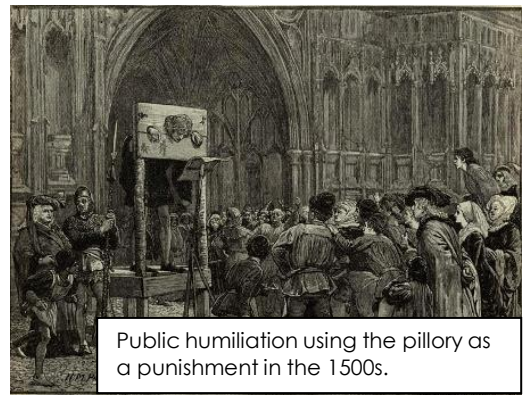
**Cruel Crime and Painful Punishment (Horrible Histories) Terry Deary (Author)**



Remember to check out the library; there are some fantastic history books in there too!

2. CORE KNOWLEDGE	
<b>1 What was trial by Ordeal?</b>	Where the outcome would be decided by God. (Trial by hot iron if the wound heals God has judged you as innocent)
<b>2 What was the Wergild?</b>	A fine paid by the person guilty of serious injury/death to someone. This was to try and stop blood feuds between families.
<b>3 What were the early forms of policing in medieval England?</b>	Hue and Cry – everyone had to be responsible for raising the hue and cry. Especially in their area.
<b>4 How were beggars in Tudor England punished?</b>	Whipped through the streets and branded with a hot iron
<b>5 What were the big crimes of the 18th and 19th Centuries?</b>	Highway robbery and smuggling
<b>6 What was the Gaols Act of 1823?</b>	To improve conditions in Prisons
<b>7 What was the new prison that was to be a model to all?</b>	Pentonville Prison
<b>8 When was a Police Force finally created and by who?</b>	1829 Sir Robert Peel
<b>9 Why was the Death Penalty eventually ended?</b>	High profile cases like Derek Bentley, Timothy Evans and Ruth Ellis
<b>10 What were the technological advances that helped the police force?</b>	Fingerprinting, DNA, ANPR (automatic numberplate recognition) CCTV

1. Key Terms	Description
<b>Blood Feud</b>	Anger and revenge that carries on between families after a serious injury or death committed
<b>Tithing</b>	A group of 10 men aged 12 and over acting as local law enforcers
<b>Corporal punishment</b>	Serious injury for a crime (whipping/burning/fingers or hand removed etc.)
<b>Capital punishment</b>	Death penalty for a crime
<b>Stocks/pillory</b>	Public humiliation as punishment feet/head and hands put into a wooden stand in the middle of town for you to be seen by all for your crime (drunk and disorderly/selling poor quality good etc.)
<b>Treason</b>	Crime against the king/government

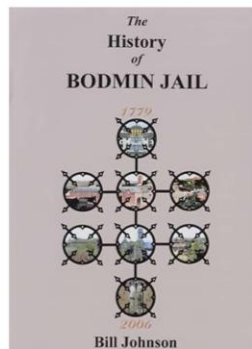


# Year 9 History Learning Cycle 3 Knowledge Organiser –

Enquiry Question: How do national events impact historical sites?

Historical Skills we will develop in this enquiry:

- Our understanding of significance
- Our understanding of using sources



The History of Bodmin Jail: 1779 - 2006 **Bill Johnson** (Author)

These are **suggestions** of reading that might help boost your history knowledge for the current enquiry.

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Remember to check out the library; there are some fantastic history books in there too!

1.Key Terms	Description
<b>National Event</b>	Something that happens that impacts the whole country- this can also have smaller impacts on local areas.
<b>Local</b>	A specific place.
<b>Reform</b>	Change
<b>Historical Site</b>	A place/building/monument that can show us something about the past.
<b>Jail</b>	Where people are held BEFORE they go to trial
<b>Prison</b>	Where people are held AFTER they are sentenced as guilty.
<b>Trial ( law)</b>	When evidence is looked at to see if someone is guilty or innocent.
<b>Primary Source</b>	Evidence from the time period. E.g. diaries/newspapers/items
<b>Secondary Source</b>	Evidence that is second hand. These sources use primary sources to support their interpretation.

## 2. CORE KNOWLEDGE

<b>1777 ( National event)</b>	John Howard published an article about how Prisons need to be reformed. In 1779 Cornwall County Jail is built and opened following these guidelines.
<b>1815 ( National event)</b>	The Napoleonic Wars create a national crime wave. More criminals mean that the prison is extended.
<b>1850</b>	Bodmin Jail is called unfit for purpose and 220 new cells are added.
<b>1868</b>	The last public execution- after this point all executions take place within the prison walls not in the town.
<b>1909</b>	The last execution at Bodmin Jail, William Hampton, aged 24. He is the last person to be hanged in Cornwall.
<b>1911</b>	The female wing of the prison is closed. Now a male only prison.
<b>1915 ( National event)</b>	The male civil prison is closed and the prison guards go off to fight in World War One.
<b>1918-1919 ( National event)</b>	The prison is used to store the Domesday Book, Government papers and the Crown Jewels.
<b>1927</b>	The Jail is formally closed.
<b>1960s</b>	The Jail opens as a nightclub
<b>2008-present</b>	The jail opens as an exhibition and museum.







# Year 9 Music Learning Cycle 3 Knowledge Organiser – Songwriting


1 TIER THREE VOCABULARY	
Songwriting	The process of creating a song, including lyrics, melody and chords.
Structure	The organisation of a song, including its sections (verse, chorus, bridge)
Strophic Form	A structure of music that has a section that repeats (usually a chorus).
Binary Form	A structure that has two clear sections (usually A and B).
Ternary Form	A structure of music that has three sections, but the first and third section are the same (e.g. A, B, A).
Rondo Form	A structure of music where a main theme happens and then alternates with different parts (A, B, A, C, A, D...)
Melody	The main tune of the music – this is typically what the lyrics would go to.
Chord Progression	A series of chords played in a certain order to create the foundation of a song.
Tonality	The overall key or mood of the piece of music. It can make a song sound happy (major) or sad (minor).
Hook	A hook is a catchy and memorable part of a song that usually gets stuck in your head!

4 LYRICAL CONTENT	
Lyrics are a crucial element of songwriting because they are the words that convey the message or story that a songwriter wants to tell. They can express a wide range of emotions and ideas and can connect with the listener on a deep and personal level.	

2 STRUCTURE	
Music must always have a clear and identifiable structure in place otherwise the music is just random chaos.	
In music, we sometimes represent each section of music (such as a verse) as a letter. There are few structures/forms we need to remember:	
<b>BINARY FORM</b>	A B
<b>TERNARY FORM</b>	A B A
<b>RONDO FORM</b>	A B A C A D...
<b>STROPHIC FORM</b>	Verse, Chorus, Bridge etc.

5 CHORDS	
Chords are three or more notes played together. They are used to create harmony in a song. The most common chords are major (happy) or minor (sad).	
There are many ways to play different chords and it is important to play what you think sounds good. Some chords tend to work better with others, and it is down to experimenting to try and find which ones fit best! Try to combine a mixture of major and minor chords in a song to make the music sounds like it progresses.	
	
<a href="https://is.gd/pianochordshelp">is.gd/pianochordshelp</a>	

3 MELODY & HARMONY	
The melody is the tune of the song and is usually the most memorable and catchy part. It is often the main focus of the song and can be created by singing or playing an instrument.	
The harmony refers to the chords and what chords are used within the song. The harmony always accompanies a melody. The harmony creates a musical backdrop for the melody and can add depth and emotion to the song.	
	

6 LINKS & FURTHER READING	
<b>Video:</b> How To Write a Song <a href="https://is.gd/howtowriteasong">is.gd/howtowriteasong</a>	
<b>Lesson:</b> Writing Lyrics <a href="https://is.gd/writinglyrics">is.gd/writinglyrics</a>	
<b>Revise:</b> Flash Card Maker <a href="https://is.gd/flashcardmaker">is.gd/flashcardmaker</a>	

# Year 9 Religious Education Learning Cycle 3 Knowledge Organiser –

How far does it make a difference if you believe in life after death?

Religion or belief	Basic ideas on life after death
Islam	<p>Islam teaches that there is life after death. This is known as Akhirah.</p> <p>In Islam, it is Allah (God) who decides when a person dies. Most Muslims believe that when they die, they will stay in their graves until Yawm al-din (the Day of Judgement). On that day, they will be raised from their graves and brought before Allah and judged on how they lived their earthly lives. This belief is known as the resurrection of the body.</p>
Judaism	<p>Jewish beliefs about life after death are ambiguous. This means beliefs are unclear and there are differences amongst Orthodox and Reform Jews. Judaism places a great emphasis on how this life should be lived. It teaches that what happens in the next life is in the hands of God. There is a general agreement that death is not the end.</p>
Christianity	<p>Many Christians believe that after death they will be taken into the presence of God, and they will be judged for the deeds they have done or failed to do during their lifetime. humans will have a spiritual existence after death, rather than a physical one. Belief in heaven and hell.</p>
Buddhism	<p>Most Buddhists believe that death marks the end of this life and the passage into the next. It is just one spoke among infinite spokes in samsara, the cycle of birth, death, and rebirth. According to the Buddha, beings go through countless births and deaths until they gain enlightenment.</p>
Sikhism	<p>Sikhs believe that life is a cycle of birth, death and rebirth. This is known as the cycle of samsara. Part of this belief is the idea of reincarnation, which is the belief that when humans die, they are reborn into a new body. Many believe there are over 8.4 million different possible life forms that they might have to experience before they are liberated from the cycle of samsara</p>
Hinduism	<p>Most Hindus believe that humans are in a cycle of death and rebirth called samsara. When a person dies, their atman (soul) is reborn in a different body. Hindus believe in karma. Many believe that good or bad actions in life - leading to positive or negative merit - determine the atman's rebirth.</p>

# Year 9 Spanish Learning Cycle 3 Knowledge Organiser

## 1. Topic vocabulary

### YEAR 9 KEY VERBS

apoyar	to support
aprender	to learn
aprobar	to pass
castigar	to punish
charlar	to chat
comenzar	to start
comprender	to understand
contestar	to answer
dibujar	to draw
empezar	to start
enseñar	to teach
entender	to understand
faltar	to be absent
fracasar	to fail
golpear	to hit
insultar	to insult
intimidar	to intimidate
levantar la mano	to put up your hand
mirar	to look at
molestar	to annoy
olvidar	to forget
optar	to choose/to opt
pasar	to happen
pedir permiso	to ask for permission
preguntar	to ask
prometer	to promise
repasar	to revise
respetar	to respect
suspender	to fail
terminar	to finish

### El día escolar

los lunes
los miércoles
las clases empiezan a
terminan a
por la mañana
por la tarde
estudio francés
tengo clase de inglés
el profe de...
el aula de...
el recreo
el almuerzo
en el patio
concentrarse
descansar
charlar
hacer los deberes
hacer novillos
sacar buenas notas
repasar los apuntes
suspender un examen

### The school day

on Mondays
on Wednesdays
the classes start at
finish at
in the morning
in the afternoon
I study French
I have English
the ... teacher
the ... classroom
breaktime
lunchtime
in the playground
to concentrate
to relax
to chat
to do homework
to skip school
to get good results
revise your notes
to fail an exam

### Las reglas

No se permite...
Tenemos que...
Está prohibido...
No se debe...
No se debería...
Se debe...
Se debería...
Es obligatorio...
maltratar a los demás

### School rules

It's not permitted...
We have...
It's prohibited
One must...
One shouldn't...
One must...
One should...
It's compulsory
to mistreat others

insultar a los demás	to insult others
golpear a los demás	to hit others
intimidar a los demás	to intimidate others
amenazar a los demás	to threaten others
llevar maquillaje	to wear make-up
llevar joyas	to wear jewellery
usar el móvil	to use your mobile
llevar uniforme	to wear uniform
llevar mi propia ropa	to wear my own clothes
mandar mensajes	to send messages
comer chicle	to chew gum
correr por los pasillos	to run in the corridors
ser puntual	to be punctual
ser educado	to be polite
ser grosero	to be rude
ser maleducado	to be impolite



# Year 9 Spanish Learning Cycle 3 Knowledge Organiser

## 2. Interesting adjectives

asombroso	amazing
activo	active
formidable	great
animado	lively
práctico	practical
magnífico	magnificent/ great
dinámico	dynamic
creativo	creative
de buen humor	in a good mood
maravilloso	marvelous
estimulante	challenging
inútil	useless
bueno	good
útil	useful
duro	hard
malo	bad
fácil	easy
emocionante	exciting
estupendo	fantastic
genial	great
serio	serious
perezoso	lazy
alegre	cheerful
sabio	wise
simpático	kind
severo/estricto	strict
entusiasmado	enthusiastic
trabajador(a)	hard-worker

## 3. Opinions

Me encanta	I love
Me gusta mucho	I really like
Me gusta	I like
me encantan	I love + plural subjects
me gustan	I like + plural subjects
No me gusta	I don't like
No me gusta nada	I really don't like
Me da(n) igual	I don't mind
Prefiero	I prefer
Odio	I hate
Detesto	I hate
No aguanto	I can't stand
lo bueno/malo es que	the good/bad thing is that
lo mejor/peor es que	the bad/worst thing is that

## 4. Further reading and websites

### The present tense:

<https://www.bbc.co.uk/bitesize/topics/zg9mhyc/articles/z63n7nb>

### The preterite tense:

<https://www.bbc.co.uk/bitesize/topics/zg9mhyc/articles/zhgfmfr>

### Using infinitives to talk about now and the future:

<https://www.bbc.co.uk/bitesize/topics/zg9mhyc/articles/zf9bhbkb>

### Pronouncing words in Spanish:

<https://www.bbc.co.uk/bitesize/topics/zhy27nb/articles/zk78382>