Penryn College

Belong | Aspire | Succeed

Year 9 Autumn 2 Knowledge Booklet

2026 - 2027

Name _____

Tutor Group _____

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At Penryn College, we are PROUD of the work in our books.



Penryn College

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We show this by:

P

Presentation



- I write the date neatly in the margin.
- I write and underline the LO and titles.
- I use black or blue pen for writing.
- I draw diagrams in pencil and label them.
- I use my best handwriting.

R

Response



- I complete all questions to the best of my ability.
- I write in full sentences.
- I highlight command words.
- I think deeply about the task.
- I show effort and do not rush my work.

O

Organisation



- I draw a line below each lesson's work.
- I set out my work clearly using steps or paragraphs.
- I keep my book tidy and in order.
- I cross out mistakes neatly with one line.
- I do not doodle in my book.

U

Use of Vocabulary



- I use key subject words.
- I check the spellings of key words.
- I highlight or underline keywords.
- I include definitions when needed.
- I use vocabulary in the correct context.

D

Dedicated Improvement



- I use red pen to respond to feedback.
- I correct my mistakes carefully.
- I edit and improve my work.
- I respond to my teacher's feedback.
- I rewrite incorrect spellings 3 times and apply in a new sentences.

★ PROUD work. Every lesson. Every book. Every student. ★

At Penryn College we want everyone

Finding My VOICE

Penryn College
"Belong, Aspire, Succeed"

We do this by:

V	O	I	C	E
VOICE	**OTHERS**	**INQUIRE**	**CRITICAL THINKING**	**EVALUATE**
Express my thinking and share my thoughts	Collaborate with others by listening and connecting ideas	Question and explore deeply	Analyse, Question and reason	Summarise and Conclude
"I think/feel that... because ... " "My view is... because ...."	"Building on what was said..." "That connects to my experience..."	"Can you explain what you mean by...?" "What makes you think that?"	"What evidence supports this?" "Could there be another explanation?"	"The most important point is..." "My thinking has changed because..."

Every lesson | Every discussion | Every student



Equipment List

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Come to every lesson ready to learn!

- Black / blue / red pens (you will need more than one)
- A ruler (15cm minimum)
- Rubber
- Pencils
- Colouring pencils
- Pencil sharpener
- Highlighters
- Glue Stick
- Whiteboard pens
- Geometry set (set square, protractor, compass)
- Scientific calculator
- Water Bottle
- iPad
- Pair of wired headphones for use with iPad

HOW DO I USE MY KNOWLEDGE ORGANISER?

SUMMARISING BIG IDEAS (Cornell Notes)









1. **READ** a full section of your knowledge booklet.
2. I**DENTIFY** the 3–5 most important points — no more.
3. **WRITE** them in your own words, as briefly as possible.
4. **CHECK** against the original — did you miss anything essential?

Focus on the big ideas – if you can explain them clearly, you are more likely to remember the details.

GETTING THE BIGGER PICTURE (Dual coding: Diagrams and text)

1. **READ** a section of your knowledge organiser.
2. **IDENTIFY** the key ideas, processes or events.
3. **DRAW** a simple diagram, timeline, flow chart or visual representation of the information.
4. **ADD** labels, key vocabulary and brief notes to your diagram.
5. **COVER** the original information and explain the diagram from memory.
6. **CHECK** your work against the knowledge organiser and use a different coloured pen to add any missing details.

Using both pictures and words helps your brain make stronger connections and improves long-term memory.

How can parents support?

- Ask your child to summarise a topic in one minute, out loud, with no notes.
- Ask them to show you the diagram version too — does it match what they said?
- Encourage brevity: a summary that's too long usually means the big ideas haven't been picked out yet.

You will use your knowledge booklet regularly throughout this term. You will use this as part of your lessons, your homework and your revision. Your teachers will guide you to which bits of information to focus on at any given time.



ART – UNIT 1 – Abstract Textile Art based on Music

Core Knowledge

By the end of this unit you will know ...

Abstract art communicates ideas through colour, line, shape, pattern and texture. Music can influence visual imagery. Textile techniques including applique, embroidery, printing, layering and fabric manipulation can be used to create expressive abstract outcomes.

- **Line** – stitched and drawn marks.
- **Colour** – fabric and media choices.
- **Shape** – applique and collage.
- **Pattern** – repeated motifs.
- **Texture** – embroidery, layering and printing.
- **Composition** – balance and contrast.
- **Music to Art** – transforming sound into visual and tactile outcomes.

Think Deeper

Explore how Kandinsky connected art and music.

Investigate how textile artists use stitch, fabric and layering to communicate movement, rhythm and emotion.

Keywords

Abstract Art, Synaesthesia, Rhythm, Tempo, Harmony, Composition, Texture, Mixed Media, Applique, Embroidery, Collage, Fabric Manipulation, Patter

Previous Knowledge

In Year 6 you built on the Elements of Art to explore abstract art, music, synesthesia and textile techniques. Inspired by Kandinsky, you create personal responses using mixed media, fabric and stitch.

Revision Support

Recall key terms, analyse Kandinsky, explain links between music and art, identify textile techniques, and review colour theory and composition.





DRAMA – UNIT 1 – The process of devising

Core Knowledge

By the end of this unit you will know ...
What devising theatre is.

- How stimulus material inspires performance ideas.
- How to identify themes and dramatic conflict.
- How theatrical style influences storytelling.
- How to structure a devised performance.
- How physical theatre develops meaning.
- How rehearsal improves performance.
- How to evaluate drama using subject-specific terminology.
- How theatre-makers refine work through feedback.
- How to communicate meaning to an audience

Think Deeper

- Symbolism
- Non-linear storytelling
- Stylised performance
- Abstract movement
- Dramatic intention
- Practitioner influence
- Audience interpretation

BBC Bitesize – Drama

National Theatre Discover

Keyword	Definition
Stimulus	Something that inspires ideas for a performance.
Theme	The main message or idea explored in a play.
Conflict	A problem or struggle between characters or ideas.
Devising	Creating an original piece of theatre from ideas rather than a script.
Ensemble	A group of performers working together equally.
Physical Theatre	Storytelling using movement and the body.
Narration	Spoken words that explain events to the audience.
Blocking	Where actors move and stand on stage.
Evaluation	Reflecting on strengths and areas for improvement.
Audience Impact	The effect a performance has on the audience.

Previous Knowledge

In Years 7 and 8 you have explored:

- Characterisation
- Freeze Frames
- Narration
- Physical Theatre
- Ensemble Skills
- Storytelling
- Frantic Assembly techniques
- Rehearsal and Evaluation

This unit builds on these skills by creating your own original performance.

DRAMA – UNIT 1 – The process of devising

1 The Devising Process

- STIMULUS
- BRAINSTORM IDEAS
- CREATE CHARACTERS
- DEVELOP CONFLICT
- STRUCTURE SCENES
- REHEARSE
- PERFORM
- EVALUATE

2 What is a Stimulus?

Examples include:

- Image
- Music
- Newspaper Article
- Story
- Theme
- Quote

Questions to ask:

- What is happening?
- Who is involved?
- Why is it happening?
- What could happen next?
- What message could the audience learn?

3 Narrative Structure

- Opening
- Introduce characters
- Problem / Conflict
- Develop the story
- Climax
- Ending / Resolution

A good opening should:

- Introduce characters
- Show the setting
- Create curiosity
- Introduce conflict



4 Drama Techniques

Technique	Purpose
Freeze Frame	Shows an important moment
Narration	Explains the story
Physical Theatre	Uses movement to communicate ideas
Ensemble	Creates teamwork and focus
Transitions	Moves smoothly between scenes
Projection	Ensures everyone can hear

5 Successful Performance Checklist

VOICE

- ✓ Projection
- ✓ Pace
- ✓ Clear articulation
- ✓ Appropriate tone

MOVEMENT

- ✓ Strong body language
- ✓ Facial expressions
- ✓ Different levels
- ✓ Controlled movement

TEAMWORK

- ✓ Everyone involved
- ✓ Good timing
- ✓ Communication
- ✓ Focus

AUDIENCE

- ✓ Clear meaning
- ✓ Engaging opening
- ✓ Interesting staging
- ✓ Confident ending

6 Evaluation

WWW (What Went Well?)

- What was successful?
- Which drama techniques worked well?
- How did the audience respond?

EBI (Even Better If...)

- What could improve?
- Was my intention clear?
- Did we work effectively as an ensemble?
- How could we communicate meaning more clearly?

KEY UNIT QUESTION

"How do theatre-makers create original performances that communicate meaning to an audience?"

ENGLISH – UNIT 1 – Nightmare Worlds

Core Knowledge

By the end of this unit you will know how to select and embed quotes , how to construct a thesis introduction, how to use similar methods as McGowan to craft the opening part of a story set in a nightmare world. How McGowan and other writers create a nightmarish tone and atmosphere through:

✓	Identified	Applied
Personification		
Imagery		
Metaphor		
Simile		
Verbs and adverbs		
Pathetic fallacy		
Foreshadowing		
Allusion		
Symbolism		
Semantic field		
Allegory		
Stalling		
Colloquial language		
Repeated motif		
Ornithological references		

Keywords

Bleak-cold, empty, without much hope or life

Isolated - far away from other people or places; alone **Merciless** - showing no kindness or pity

Insidious - causing harm gradually and stealthily **Pernicious** - extremely damaging in a way which is not always immediately obvious

Treacherous - dangerous in its untrustworthy or unpredictable nature

Necrotic - dead or decaying

Post-apocalyptic - a world where a huge disaster has destroyed much of civilisation to a point where it is beyond recognition

Macabre - strange or unsettling because it involves death or horror

Inhospitable - a person or place who is the opposite of welcoming; a hard place to survive

Previous Knowledge

- InYear 8, you analysed the way Arranmore was described, focusing on the use of personification.
- You practised using embedded quotes and making inferences.
- You explored family relationships
- You described a moment of conflict

Think Deeper

- incorporate **dual interpretation**
- Interpret the **wilderness** as an **extended metaphor**
- Explore McGowan's views, concerns and attitudes about:
- Brotherhood
- Childhood
- Poverty
- Strong bonds
- Resilience
- Hope & Despair

ENGLISH – UNIT 1 – Nightmare Worlds

Example analytical paragraph

McGowan presents the Yorkshire Moors as a malevolent, insidious and pernicious force. One way he does this is through giving it a sinister nature, deliberately using **personification** to make the wind sound devious. The wind is 'clever' and 'sneaking up your collar' which creates a mischievous tone. Furthermore, the word 'sneaking' has **connotations** of something which is villainous and dangerous and sounds like something a thief might do. This helps creates a setting which is nightmarish because the weather is out to get the protagonist and adds more danger to the situation. Alternatively, 'sneaking' is something playful and is reminiscent of childhood games which reminds readers that the boys are growing out of that **stage** of life; as symbolised by Mum's return.

Why this?

Year 9 will start with a novella that'll keep you on the edge of your seat. Seemingly simple, the story enables us to appreciate the art of building **tension**. You'll explore a fraternal relationship and develop your understanding of the complex and changing nature of family relationships. You will also recap descriptive writing skills, building on **characterisation** and continue to develop language and **structure** analysis and application in greater depth and detail.

Why now?

At this point in your journey through literature, you are ready for more complex issues around ableism and to explore how the dystopian genre can address societal concerns.

Assessment and revision

Reading: An analysis of how a theme is presented in the novella
Writing: The opening of a story

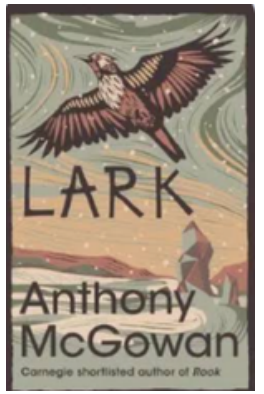
Revision Support

Audio of the book

ENGLISH – UNIT 1 – Nightmare Worlds



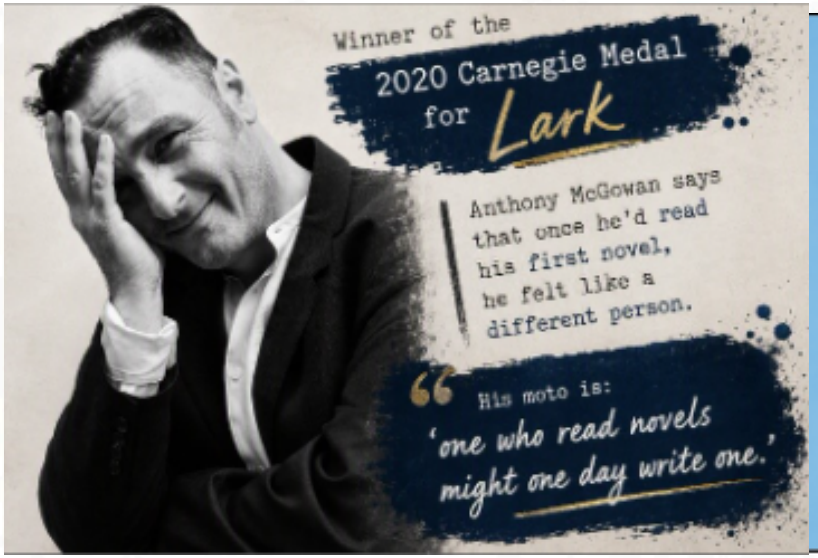




Characters:



Nicky, Kenny, Tina, Mum, Dad, Jenny







FOOD – UNIT 1 – Eat Well For Less

Core Knowledge

By the end of this unit you will know ...
Food choices are influenced by: Cost and rising food prices, availability of ingredients, religious beliefs, ethical and moral beliefs, cultural traditions, health and nutritional needs and personal preferences.
Ways to reduce food costs include: Planning meals before shopping, creating shopping lists, comparing prices, buying seasonal foods, using leftovers, storing food correctly and reducing food waste.
People may follow specialist diets for: Religious reasons (e.g. Halal, Kosher), ethical reasons (e.g. Vegetarian, Vegan) and medical reasons (e.g. allergies, intolerances).
When analysing a recipe consider: Nutritional value, cost of ingredients, sustainability, suitability for dietary needs and ways to reduce sugar, fat or salt.

Think Deeper

- Food prices can rise because of: Increased energy costs, transport costs, extreme weather affecting crops and global supply issues.
- Recipes can be adapted by: Using reduced-fat ingredients, replacing sugar with fruit, baking instead of frying, and increasing vegetables to improve nutrition.

BBC Bitesize Revision

Keywords

- **Nutrients:** Substances in food needed for health and growth.
- **Specialist Diet:** A diet followed for health, ethical or religious reasons.
- **Ethical:** Relating to moral beliefs about food production and consumption.
- **Cultural:** Traditions and customs that influence food choices.
- **Consumer:** A person who buys goods and services.

Previous Knowledge

- Lifeskills- Budgeting.
- RE Religious Traditions and dietary requirements.
- Y7 Food Bread Making, Knife skills, Religious dietary requirements.
- The Eat Well For Less project will allow you to review our nutritional needs and the requirements for specific groups of people and specialist diets.
- You will analyse recipes and specific ingredients and develop skills in writing and planning your own recipes. This will include costing ingredients and considering the most ethical and cost-effective means of buying your ingredients.
- You will explore ways to be a cost-effective consumer, exploring ways to buy and store food to make it last longer and be more effective in recipes.

FOOD – UNIT 1 – Eat Well For Less











FRENCH – UNIT 2 – Free Time

Core Knowledge

- **Perfect Tense**– what has happened
- **Near Future tense** – what is going to happen
- To use à and de with **masculine** / **feminine** / **plural** nouns when talking about what you do or play.
- Give and **justify** positive/negative opinions on activities you do in your free time.
- Use the near future tense to say 'I am going to' with different infinitives (unchanged verbs) and what it will be like.
- Use the perfect tense to say what you have done and what it was like.
- Use different **question words** to talk about what you like/dislike.
- Describe what you did in a competition

Think Deeper

- Vary **pronouns** with **near future tense**
- Vary pronouns with **perfect tense**
- Combine past, present and future tenses

Keywords

What are you going to do? - Qu'est-ce que tu vas faire?

What have you done? - Qu'est-ce que tu as fait?

Have you already taken part in a competition? - As-tu déjà participé à une compétition?

Regular/Irregular verbs - The pattern/or not verbs take with **pronouns**

Present/Perfect/Near Future - What happens/has happened/is going to happen

Previous Knowledge

In this unit you will build on the key free time and opinions vocabulary from unit 1 as well as develop your ability to combine different tenses to produce more complex language when describing your hobbies and interests.

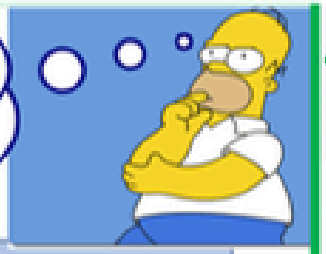
FRENCH – UNIT 2 – Free Time

Activities, opinions and tenses

Present tense of avoir

J' ai
tu as
il/elle/on a
nous avons
vous avez
Ils/elles ont

How is the perfect tense formed?



+ **Past participle of verb**

regarder – regardé
finir – fini
entendre – entendu

perfect tense

J'ai fait	I did
J'ai écouté	I listened
J'ai pris	I took
J'ai marché	I walked
J'ai bu	I drank
J'ai joué	I played
Je suis allé(e)	I went

I listen	J'écoute
I share	Je partage
I speak	Je parle
I download	Je télécharge
I search	Je cherche
I play	Je joue
I watch	Je regarde
I buy	J'achète

*je n'ai **rien** acheté* – I haven't bought anything
*on n'a **rien** vu* – we haven't seen anything



j'aime	je n'aime pas	j'adore	je déteste
❤	😐	❤❤	😐😐

J'ai fait (de)... I did...



de la natation

du surf





de l'équitation

de

J'ai joué (à)... I played...



au volley

au rugby





au cricket

aux échecs

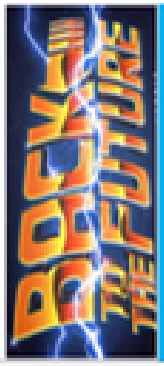


Qui...?	Who?
Où...?	Where?
Quand...?	When?
Pourquoi...?	Why?
Quoi?!	What?!
Combien...?	How much?
Quel...?	What...?
Comment...?	How?
Est-ce que...?	Do...?
Qu'est-ce que...?	What...?

IT WAS: C'était
IT WILL BE: Ce sera

Le weekend dernier - Last weekend
La semaine dernière - Last week
L'année dernière – Last year

Je suis / Tu es...? I am / You are..?
Je fais / Tu fais...? I do / You do...?
J'ai / Tu as...? I have / You have...?
Je vais / Tu vas...? I go / You go...?



je vais	
tu vas	
il/elle/on va	
nous allons	
vous allez	
ils/elles vont	

verbs

jouer – to play
faire – to do
regarder – to watch
aller – to go
avoir – to have
manger – to eat

GEOGRAPHY – UNIT 2 – Tectonic Hazards

Core Knowledge

Earth has four main layers: the **crust** is solid rock; the **mantle** is mostly solid rock that flows slowly; the **outer core** is liquid metal; and the **inner core** is solid metal.
Earthquakes and **volcanoes** are mainly distributed (located) along **plate boundaries** (where two plates meet).
Oceanic crust lies beneath the oceans and is thinner and denser than **continental crust**, which lies beneath the land.
When two plates meet, they can either come together, move apart or slide alongside each other. Depending on the movement and types of **crust**, they either create **earthquakes**, **volcanoes**, or both.
There are three main types of volcano: **composite volcanoes** have layers of **lava** and ash; **shield volcanoes** are formed mainly from **lava** flows; and cinder cones are built from erupted fragments.
People live near hazards like **volcanoes** and **earthquakes** for different reasons: they don't know the risk, they can't afford to move away, there are benefits such as fertile soil or **minerals** in the earth.
Volcanic eruptions can be managed through monitoring, education, safety and evacuation planning, and emergency responses.
Earthquakes are caused when two plates move against each other and get stuck, creating friction and building up pressure or strain energy. When this is suddenly released, an earthquake occurs.
The Nepal 2015 earthquake killed 9,000 people and injured 20,000 people. 3 million people were made homeless when homes were destroyed. Ground shaking triggered landslides and avalanches in the Himalayas. The cost of damage was over US$5 billion. The Chile 2010 earthquake killed 500 people and injured 12,000 people. 220,000 homes were destroyed. Several coastal towns were damaged by a **tsunami** wave and a fire was caused at a chemical plant near the capital city Santiago. The cost of damage was estimated at US$30 billion.
The risks from **tectonic hazards** can be reduced by monitoring hazards for warning signs and using historical records to predict when and where a **hazard** may happen, then preparing emergency response.
Protection during an earthquake involves constructing buildings that can resist the ground shaking using strong, flexible materials, cross bracing and deep foundations with shock absorbers.

Keywords

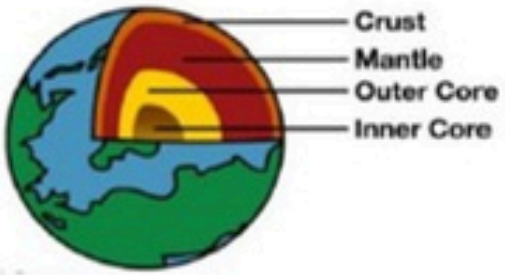
Convection currents - the slow circulation of material within Earth's **mantle**, which contributes to plate movement.
Continental crust- thicker, less dense **crust** under the land.
Distribution - the pattern of a geographical feature.
Epicentre - the point on Earth's surface directly above an earthquake's **focus**.
Focus - the point within Earth where an earthquake begins.
Hot spots - areas where rising hot **mantle** material can produce **volcanoes**, including away from **plate boundaries**.
Lahar- volcanic mudflow, formed by water mixed with ash.
Lava- molten rock above the Earth's surface (erupted).
Magma- molten rock beneath the Earth's surface.
Magnitude- measurement of how much energy is released during an ear thquake.
Oceanic Crust- thinner, denser **crust** under the oceans.
Plate boundary- where two plates (pieces of the Earth's **crust**) meet.
Primary effects - happen immediately and are caused by the ground shaking e.g. deaths, injuries and damage to roads and buildings.
Pyroclastic flow- a super-heated mass of gas, ash and volcanic material violently erupted at rapid speed.
Secondary effects - are a result of the **primary effects** (ground shaking) and include **tsunami**, fires and landslides.
Seismometer - an instrument that detects and records seismic waves.
Subduction- when the denser, **oceanic crust** is forced under the less dense **continental crust** at a **destructive** boundary.
Tsunami- fast moving wave caused by an earthquake under the sea.
Volcano- a cone-shaped mountain made from erupted **lava** and ash.

Previous Knowledge

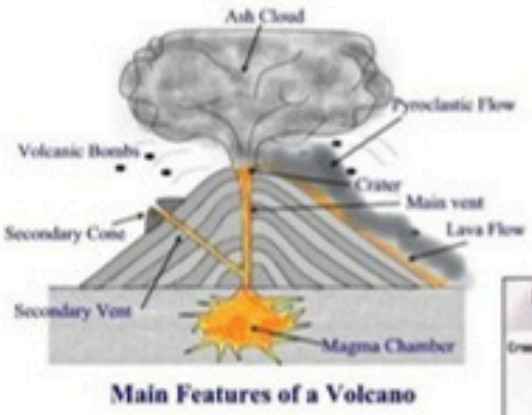
We learn about the distribution of plates and plate tectonic theory to explain how and why plates move. This helps to have a better understanding of why **earthquakes** and volcanic eruptions occur. We compare **earthquakes** and **volcanoes** and their risks to consider how to manage and prepare for future risk as well as to design our own earthquake-resistant buildings.

GEOGRAPHY – UNIT 2 – Tectonic Hazards

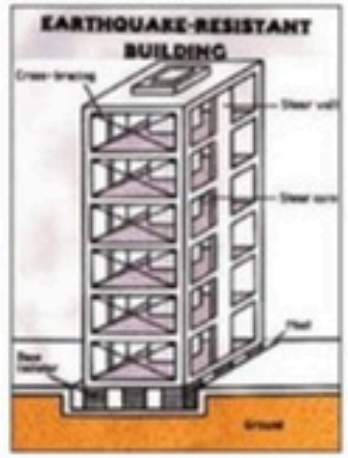
Earth's layers, plate boundaries and hazard protection

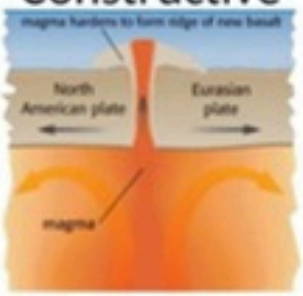


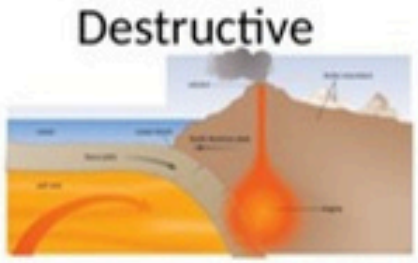




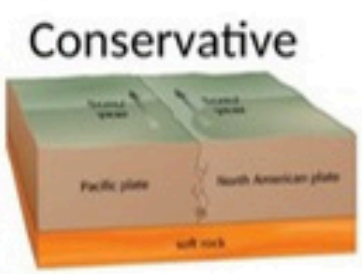
Main Features of a Volcano











Think Deeper

Earth's layers formed as denser materials sank towards the core and less dense materials remained closer to the surface. Internal heat includes heat from radioactive decay.

Destructive plate boundaries are often considered to be the most dangerous because of the risk of powerful **earthquakes** and explosive eruptions of **composite volcanoes**, as well as tsunamis.

Responses to **tectonic hazards** are often stronger in **high-income countries**, which can invest in emergency services and rapid repairs and rebuilding. Effective preparation and response can reduce negative effects.

It is not possible to accurately predict exactly when or where an earthquake will occur, so planning is important to educate people how to stay safe and keep high value land uses such as hospitals protected.

Revision Support

BBC Bitesize: tectonic hazards

Link 1 Link 2 Link 3

HISTORY – UNIT 2 – The Holocaust

Core Knowledge

- The early life of Hitler.
- How the Nazi Party were able to rise to power.
- Why ordinary Germans started to vote for the Nazi Party.
- The Nazis believed in the idea of an Aryan master race and used racist ideas to **justify** persecution.
- Jewish people, Roma people, disabled people, political opponents and other groups were targeted by the Nazi regime.
- **Propaganda** was used to spread anti-Semitic ideas and gain support for Nazi policies.
- The **Holocaust** was the systematic murder of approximately six million Jewish people during the Second World War.
- The Holocaust involved perpetrators, collaborators, bystanders, rescuers and resisters.
- **Concentration** camps and extermination camps formed part of Nazi persecution and mass murder.
- Historians debate how much ordinary Germans knew about the Holocaust and who should be held responsible.
- The Holocaust is remembered through memorials, museums, survivor **testimony** and Holocaust **Memorial** Day.
- Historical skills: inference, source analysis, significance, interpretations and historical judgement.

Keywords

Democracy – A system where people vote for their government.
Dictatorship – A system where one person has complete power.
Propaganda – Information used to influence opinions and beliefs.
Nazi Party – The political party led by Adolf Hitler.
Chancellor – The leader of Germany.
Reichstag Fire – The fire in the German Parliament building in 1933.
Enabling Act – Law that gave Hitler dictatorial powers.
Aryan – The race Nazis believed was superior.
Anti-Semitism – Prejudice against Jewish people.
Scapegoat – A person or group blamed for problems they did not cause.
Holocaust – The systematic murder of six million Jewish people by the Nazis.
Ghetto – An area where Jewish people were forced to live.
Concentration Camp – A prison camp used by the Nazis.
Extermination Camp – A camp designed for mass murder.
Final Solution – Nazi plan to murder Europe's Jewish population.
Perpetrator – Someone who commits a **crime**.
Collaborator – Someone who helps others commit crimes.
Bystander – Someone who witnesses events but takes no action.
Resister – Someone who opposes unjust actions.
Rescuer – Someone who helps save others from persecution.
Memorial – A **structure** created to remember people or events.
Testimony – A survivor's account of an event.

HISTORY – UNIT 2 – The Holocaust

Think Deeper

Historians continue to debate why the **Holocaust** happened and who was responsible. Some historians focus on Hitler's ideology and **leadership**, while others argue that ordinary Germans, Nazi officials, collaborators and bystanders also played important roles.

- Explain how Hitler's early life influenced his later beliefs.
- Assess why Germans supported the Nazi Party.
- **Evaluate** the importance of **propaganda** in Nazi Germany.
- Explain how persecution developed from **discrimination** to genocide.
- Analyse historical sources and interpretations about the Holocaust.
- Reach a judgement about responsibility for the Holocaust using evidence.
- Understand why Holocaust remembrance remains important today.

Previous Knowledge

At the start of yr 9, you studied the causes of the Second World War including the Treaty of Versailles, Hitler's foreign policy, appeasement and the failure of the League of Nations. You also developed important historical skills such as analysing sources, explaining cause and **consequence** and evaluating interpretations.

Unit overview

In this unit, you will build on this knowledge by investigating Adolf Hitler's early life, the rise of the Nazi Party and why millions of Germans supported Nazi ideas. You will examine how **propaganda** influenced public opinion and how Nazi racial beliefs led to the persecution of Jewish people and other minority groups.
You will explore the **Holocaust**, including ghettos, **concentration** camps, extermination camps and the Final Solution. Finally, you will investigate who was responsible for the Holocaust and why it continues to be remembered today.
Throughout the enquiry you will develop your skills of source analysis, inference, significance, interpretation and historical judgement.

Revision support

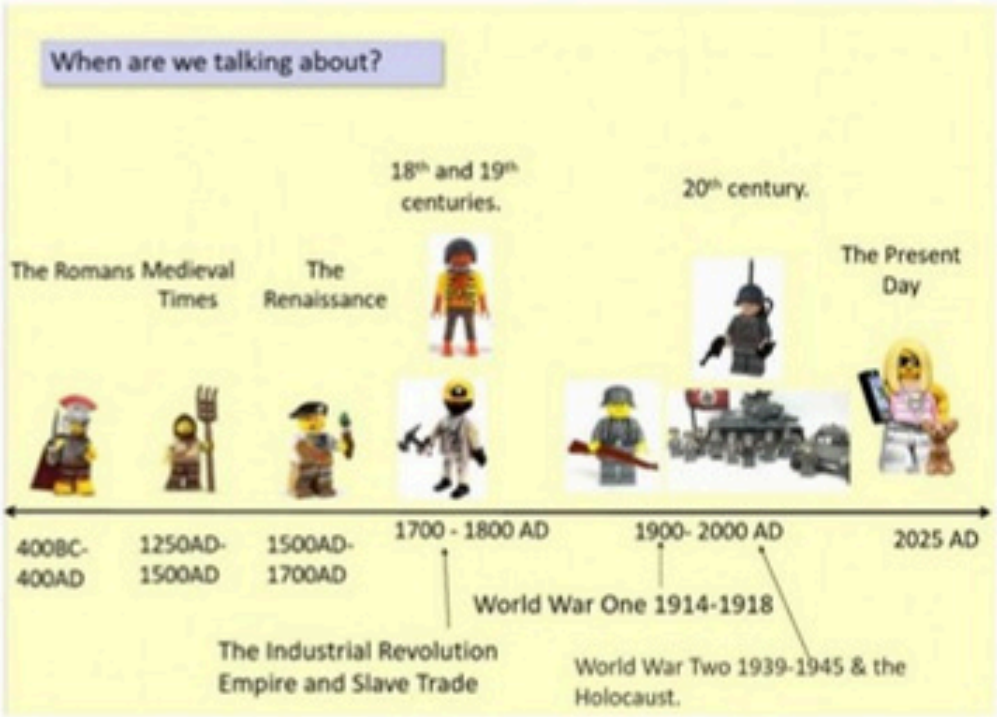
Websites
BBC Bitesize: Nazi Germany
Holocaust Educational Trust
Imperial War Museums Holocaust Learning Resources
Yad Vashem
United States Holocaust **Memorial** Museum
BBC Teach Holocaust Resources

Recommended reading
The Diary of Anne Frank
Once by Morris Gleitzman
When Hitler Stole Pink Rabbit by Judith Kerr
The Boy in the Striped Pyjamas (fiction for discussion purposes)

Documentaries
Holocaust Educational Trust Survivor Testimonies
BBC Teach Holocaust Videos

HISTORY – UNIT 2 – The Holocaust

Historical timeline



Europe in the 1930s



Nazi concentration camps, 1933–34



Major Nazi camps, 1943–44



LIFESKILLS – UNIT 2 – Health and Wellbeing

Core Knowledge

- What breast and testicular **cancer** are and why recognising changes in the body and seeking medical advice early is important.
- The importance of taking responsibility for your own health, including **self-examination**, **screening** and knowing how to access medical support.
- How social media and online content can create unrealistic expectations about **body image** through comparison.
- How negative body image and unhealthy online comparison can affect **self-esteem** and mental wellbeing, and where to access support.
- Why sufficient, good-quality **sleep** is important for physical health, mental wellbeing and learning.
- How healthy routines, including reducing **screen use** before bed, can improve sleep quality and overall wellbeing.

Think Deeper

- Why **self-examination**, **screening** and accessing appropriate healthcare can support the early identification of health conditions.
- How different methods can be used to investigate, diagnose and treat **cancer**.
- How people can curate or edit what they share online, meaning online content may not accurately represent everyday life.
- How to challenge unrealistic representations, manage online comparison and access appropriate support.
- How personal choices and routines, including **screen use**, can affect the quality of **sleep**.
- How good-quality sleep supports mood, **concentration**, learning, physical health and overall wellbeing.

Keywords: Essential

Cancer: A condition where abnormal **cells** grow and divide uncontrollably.

Self-examination: Checking or being aware of your body to recognise unusual changes.

Symptoms: Changes in the body that may indicate an illness or health condition.

Body image: How a person thinks and feels about their body and appearance.

Self-esteem: How a person values and views themselves.

Comparison: Judging yourself or aspects of your life against other people.

Wellbeing: A person's overall physical and mental health.

Sleep quality: How well a person sleeps and gains the rest their body and mind need.

Previous Knowledge

- How everyday choices can positively or negatively affect physical and mental health.
- How **personal hygiene**, diet and other healthy behaviours can help protect physical health.
- How peer and social influences can affect attitudes, decisions and behaviours.
- How online experiences and influences can positively or negatively affect wellbeing.
- Why good-quality **sleep** is important for physical health, mood, **concentration** and learning.
- How **screen time**, **caffeine**, diet and routines can affect sleep quality.
- Strategies for developing and maintaining a healthy sleep routine.

LIFESKILLS – UNIT 2 – Health and Wellbeing

Independent Learning Lessons

Intimate Health Care

Time Online & Self-esteem

The importance of quality sleep

Sleep Advice



Remember why **sleep matters**



Stay **active**



Cut back on **caffeine**



Watch bedtime **eating**



Build a bedtime **routine**



Switch off **screens** early



Create a **calm** sleep space



Have a **comfortable** bed



Build **good habits** early

MATHS – UNIT 2 – Algebra and Non-Linear Graphs

Equations, Inequalities and Formulae

Equations show that two expressions are equal, while **inequalities** compare values using symbols such as <, >, ≤ and ≥. To solve an **equation** or **inequality**, use **inverse operations** and perform the same operation to both sides to keep them balanced. Equations may contain brackets, **fractions** or unknowns on both sides. When multiplying or dividing an inequality by a negative number, the inequality sign must reverse. **Formulae** describe relationships between **variables**. Values can be substituted into formulae, and formulae can be rearranged using inverse operations to change the **subject**. Solutions can be checked by substituting them back into the original equation or **formula**.

Think Deeper

Explore more challenging problems by solving **equations** and **inequalities** with brackets, **fractions** and unknowns on both sides, rearranging two-step **formulae**, using factorisation to solve **quadratic** equations, and comparing quadratic, cubic, reciprocal and exponential graphs using features such as roots, intercepts, turning points and asymptotes.

Algebraic Manipulation

Algebraic expressions can be rewritten in different but equivalent forms. Expanding means multiplying every term inside a bracket by the term outside; this can be extended from single brackets to products of two or three brackets. Like terms can then be collected to simplify the expression. **Factorising** is the reverse of expanding and involves writing an expression as a product of factors. **Quadratic** expressions such as x^2+5x+6 can be factorised into two brackets by finding two numbers whose product is 6 and whose **sum** is 5. A quadratic **equation** equal to zero can then be solved using the fact that if a product is zero, at least one of its factors must be zero.

Non-Linear Graphs

Non-linear graphs do not form straight lines. Values can be substituted into an **equation** to create a table of coordinates, which are then plotted and joined with an appropriate smooth curve. **Quadratic** graphs are parabolas and are symmetrical, while cubic, reciprocal and exponential functions have different characteristic shapes. Graphs can be interpreted to estimate values of x or y. Roots are the values of x where a graph crosses the x-axis, an **intercept** is where a graph crosses an axis, and a **turning point** is where the graph changes direction. Reciprocal and exponential graphs can also approach lines called asymptotes without reaching them.

MATHS – UNIT 2 – Algebra and Non-Linear Graphs

Keywords: Equations and Formulae

Equation – a statement showing that two expressions have the same value, e.g. $2x+3=11$.
Inequality – a statement comparing two values or expressions using $<$, $>$, $\leq$ or $\geq$, e.g. $x > 4$. An inequality usually has a **range** of possible solutions rather than one answer.
Solution – a value of the unknown that makes an equation or inequality true, e.g. $x=4$ is the solution to $2x+3=11$.
Inverse operation – an operation that reverses another operation, e.g. subtraction reverses addition and division reverses multiplication.
Formula – a mathematical rule showing the relationship between different **variables** or quantities, e.g. $v = d \div t$.
Subject – the **variable** that has been isolated on one side of a formula, e.g. in $v = d \div t$, v is the subject.
Rearrange – change the form of a formula so that a different variable becomes the subject, while keeping the relationship equivalent.

Previous Knowledge

- In Years 7 and 8 you used algebraic notation, substitution and collecting like terms.
- You solved one- and two-step **equations** using **inverse operations** and checked solutions.
- You expanded and factorised single brackets and worked with positive and negative numbers.
- You used coordinates and tables of values to plot and interpret **linear** graphs.
- You used powers and the order of operations when substituting values.

Keywords: Algebraic Manipulation

Expand – multiply every term inside a bracket by the term outside it, e.g. $3(x+4)=3x+12$.
Factorise – write an expression as a product of factors using brackets; it is the reverse of expanding, e.g. $3x+12=3(x+4)$.
Factor – a number or algebraic term that divides exactly into another number or term.
Binomial – an algebraic expression containing exactly two terms, e.g. $x+5$ or $3x-2$.
Quadratic – an expression, **equation** or **function** whose highest power of the **variable** is 2, usually involving x^2, e.g. x^2+5x+6.
Identity – an equality that is true for every permitted value of the variable, e.g. $(x + 2)(x + 3) = x^2 + 5x + 6$.

Keywords: Non-Linear Graphs

Non-linear –a relationship whose graph is not a straight line.
Parabola – the smooth, symmetrical curve made by a **quadratic** graph; it is usually U-shaped or upside-down U-shaped.
Root – an x-value where the graph has $y=0$; this is where the graph meets the x-axis.
Intercept – a point where a graph crosses or meets one of the axes. For example, a y-intercept occurs where $x=0$.
Turning point – a point where a graph changes direction, such as from decreasing to increasing. On a quadratic graph this is its maximum or minimum point.
Asymptote – a line that a graph gets closer and closer to but does not meet, such as the axes on a reciprocal graph.

MATHS – UNIT 2 – Algebra and Non-Linear Graphs

SKILL / TOPIC	SPARX CODE
EQUATIONS, INEQUALITIES AND FORMULAE	
Solving equations with one step	M707
Solving equations of the form $ax + b = c$	M634
Solving equations of the form $\frac{x}{a} + b = c$	M647
Mixed problems: solving equations of the forms $ax + b = c$ and $\frac{x}{a} + b = c$	M855
Solving equations of the form $\frac{x + a}{b} = c$	M401
Solving linear equations involving brackets	M902
Solving single inequalities	M118
Solving double inequalities	U145
ALGEBRAIC MANIPULATION	
Expanding single brackets	M237
Expanding single brackets and simplifying expressions	M792
Expanding double brackets	M960
Factorising into one bracket	M100
Factorising into two brackets	M908
Factorising to solve quadratic equations of the form $x^2 + bx + c = 0$	U228
Expanding triple brackets	U606
NON-LINEAR GRAPHS	
Substituting into expressions	U201
Plotting graphs of quadratic functions	U989
Interpreting graphs of quadratic functions	U667
Sketching quadratic graphs	U310
Graphs of cubic functions	U980
Graphs of reciprocal functions	U593
Graphs of exponential functions	U229

Solving equations

$3x + 5 = 17$
$-5 \quad -5$
$3x = 12$
$\div 3 \quad \div 3$
$x = 4$

$\frac{x}{4} + 3 = 8$
$-3 \quad -3$
$\frac{x}{4} = 5$
$\times 4 \quad \times 4$
$x = 20$

$\frac{x + 5}{3} = 7$
$\times 3 \quad \times 3$
$x + 5 = 21$
$-5 \quad -5$
$x = 16$

$5x + 2 = 3x + 10$
$-3x \quad -3x$
$2x + 2 = 10$
$-2 \quad -2$
$2x = 8$
$\div 2 \quad \div 2$
$x = 4$

Use inverse operations and keep both sides balanced.

Inequalities

$2x + 3 < 11$
$-3 \quad -3$
$2x < 8$
$\div 2 \quad \div 2$
$x < 4$



When multiplying or dividing by a negative, reverse the inequality sign.

$-2x < 12$
$\div -2 \quad \div -2$
$x > -6$

Expanding and factorising

Expanding a single bracket

$3(x + 4) = 3x + 12$

Expanding double brackets

$(x + 3)(x + 2) = x^2 + 5x + 6$

Factorising

$x^2 + 5x + 6 = (x + 2)(x + 3)$

Solve a quadratic by factorising

$x^2 + 5x + 6 = 0$

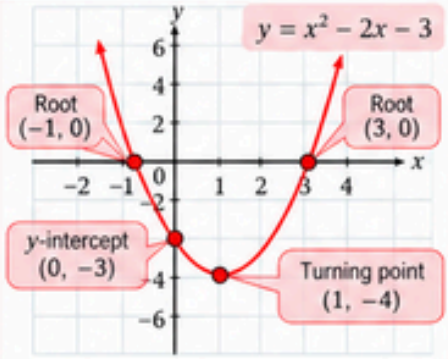
$(x + 2)(x + 3) = 0$

$x + 2 = 0$ or $x + 3 = 0$

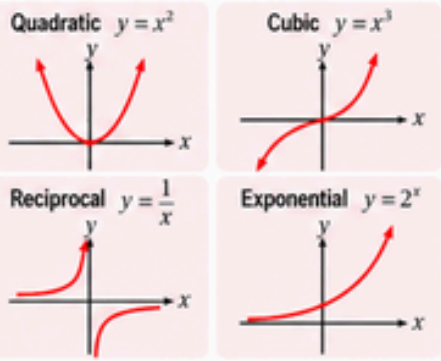
$x = -2$ or $x = -3$

If a product is 0, at least one factor must be 0.

Quadratic graphs



Graph families



MUSIC – UNIT 1 – Evolution of Popular Music

Core Knowledge

By the end of this unit you will know ...
Popular music is music that lots of people enjoy, is easy to listen to and remember, and is usually made for a big audience in styles like pop, rock, hip-hop, dance, R&B, reggae, country, and electronic music.
To understand and demonstrate how the elements of music are used in Popular Music. To be able to perform in a band using Tonality, Melody, Harmony, Rhythm, Texture, Structure, and Instrumentation.

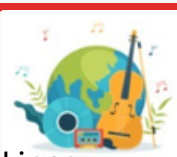
Think Deeper

Triad Chords - chords made up of three notes: the root, the third, and the fifth, played together to create harmony.
Sampling - is when part of an existing song is taken and reused in a new piece of music, often in music production or remixes to create new tracks.
Arrangement/Cover - is when a musician creates their own version of an existing song by changing things like the instruments, style, or structure.
Chord progression – a pattern of chords played one after another in a piece of music.
Extended Chords - chords with extra notes added to make them sound more interesting i.e. 7th chords.
Cadence is a chord change that sounds like a pause or full stop at the end of a phrase.
Sequence – when a musical idea or pattern is repeated at a higher or lower pitch.
Conjunct (moves by step) Disjunct (moves in leaps).
Inversions - when the notes of a chord are rearranged so a different note is the lowest (bass) note, instead of the root.
Fade-Out – music gradually gets quieter until it disappears.
Hook – a short, catchy musical idea or phrase designed to grab the listener's attention.

Keywords

- **Tonality** - the key or scale a piece of music uses (e.g. major or minor), which helps create its overall mood.
- **Harmony** - is when two or more notes are played or sung at the same time, often using chords and a bass line, to support the melody and create a richer, fuller sound.
- **Melody** - a catchy tune, often sung by the singer.
- **Texture** - how many layers of sound there are in music and how they fit together (e.g. melody, chords and bass).
- **Structure** - how a piece of music is organised into sections and put together i.e. verse-chorus.
- **Rhythm** - the pattern of long and short notes grouped together to create the "feel" of the music.
- **Instrumentation** - the choice of instruments used in a piece of music and how they are used together.
- **Chords** - three or more notes played together to create harmony and support melody i.e. C major chord (C, E, G).
- **Bass line** - the lowest part in a piece of music, usually made up of single notes, that supports the chords and harmony.
- **Riff** - a short, repeated musical pattern that is catchy and often forms a main idea in a piece of music.
- **Repetition** - is when a musical idea or section is played more than once to make it familiar, catchy, and help structure the piece.

Previous Knowledge

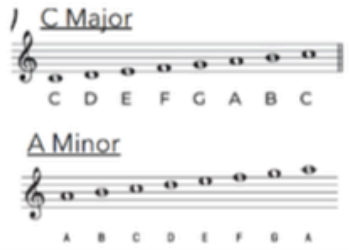


Year 8 Unit 1 (Blues): Melody, Chords, Bass
Year 8 Unit 3: (Reggae): Simple Harmony, Chords & Bass Lines

MUSIC – UNIT 1 – Evolution of Popular Music

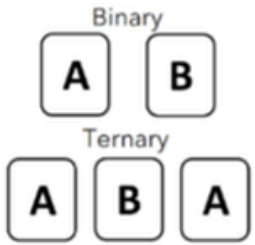
Tonality

The scale (group of notes) used in a piece of music



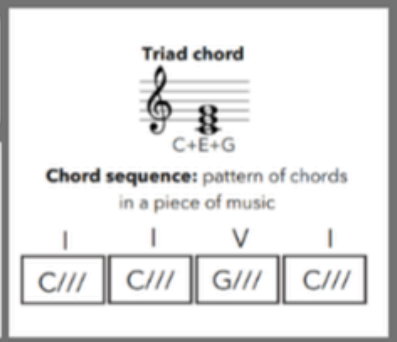
Structure

How a pair of music is organised



Harmony
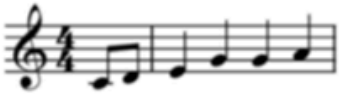
When two or more notes are played together



Melody

A pattern of different note durations and pitches

Words to describe melody: Step, leap, rise and fall



Instrumentation

The instruments that are used in a piece of music and their role



Rhythm

A pattern of different note durations



= 4 beat rhythm







Scan for BBC Bitesize Revision Support

PHYSICAL EDUCATION – UNIT 2

Unit Overview

In this unit, students will develop their understanding of tactics and strategies across two of four sports: Football, Gymnastics, Fitness, Badminton and Hockey. They will build on previously learnt skills by focusing on **tactical awareness**, **decision-making** and adapting their performance to different situations. By the end of the unit, students will be able to select, apply and analyse appropriate tactics and strategies to improve individual and team performance in competitive games, routines and fitness activities.

Tick your two sports: ☐ Football ☐ Fitness ☐ Badminton ☐ Hockey

Core Knowledge

Football - Tactics and Strategies
A **high press** involves applying pressure near the opposition's goal to force mistakes and regain possession.
A **low block** involves defending deep in your own half, while a **mid block** involves defending in the middle areas of the pitch.
Defensive compactness reduces space between teammates, making it harder for opponents to create attacking opportunities.
Playing out from the back uses **width**, **depth**, passing lanes and support to maintain possession and progress the ball into attack.
Transition play involves switching between attack and defence, using **counterattacks** when possession is regained and defensive **recovery** when possession is lost.

Hockey – Tactics and Strategies
Selecting **when and where to use the hit** helps progress the ball into space and create attacking opportunities.
Defensive channeling uses body and stick positioning to guide attackers away from dangerous areas and influence their decisions.
In a **2v1**, attackers draw the defender towards the ball before passing to a supporting teammate to exploit space.
Attacking overloads create numerical advantages by having more attackers than defenders in an area.
Penalty corners use structured movement, passing and shooting routines to create scoring opportunities.

Badminton – Tactics and Strategies
Short, **high** and **flick serves** can be selected according to an opponent's position to create an advantage at the start of a rally.
Combining an **overhead clear** and **drop shot** moves opponents between the front and back of the court, creating space.
Singles tactics use **width**, **depth**, **shot placement** and **recovery** to move opponents and create scoring opportunities.
Attacking doubles formations use **front-and-back** positioning, while **defensive formations** use **side-by-side** positioning.
Communication and **rotation** help doubles partners cover the court and adapt their positioning during rallies.

Fitness – Training Strategies
Exercise selection involves choosing appropriate **bodyweight** and **plyometric** exercises to develop specific fitness components, including strength, endurance and power.
Lower-body training strategies use **squat** and **deadlift** variations to achieve different fitness goals.
Upper-body training strategies use exercises such as bench presses, press-ups and shoulder presses to develop strength and power.
Progressive overload involves gradually increasing the demands of exercise to encourage improvements in fitness.
Rowing pacing strategies involve controlling effort, stroke rate and intensity to maintain performance over different distances.
Training programmes combine appropriate exercises, intensity and **recovery** to achieve specific fitness goals.

Think Deeper

Football: Selecting the appropriate defensive formation, pressing strategy or attacking transition helps teams exploit space, regain possession and create an advantage.
Fitness: Selecting appropriate exercises, applying **progressive overload** and adapting pacing strategies helps achieve specific fitness goals and improve performance.
Badminton: Using tactical shot selection, **width** and **depth** helps move opponents, while effective doubles formations improve court coverage and create attacking opportunities.
Hockey: Selecting effective **defensive channeling**, **attacking overloads** and structured set plays helps influence opponents' decisions and create scoring opportunities.

Previous Knowledge

How to apply **coordination** to improve passing, receiving, **dribbling**, turning and defensive skills in Football and Hockey. How to use **deception**, **double movement** and coordinated footwork to create space and evade defenders.
How to apply **balance** and body control during gymnastics skills, including jumps, rolls, **cartwheels** and partner balances. How to maintain **static** and **dynamic balance** during bodyweight, **plyometric** and resistance exercises in Fitness. How to coordinate racket action, body position and timing when performing serves, clears, smashes, **net shots** and **drives** in Badminton.
How to apply previously learnt skills with accuracy, control and consistency in competitive games, gymnastics routines and fitness workouts

PERIOD 4 – PERSONAL DEVELOPMENT – Stereotypes and Discrimination

Core Knowledge

- How stereotypes are formed and reinforced.
- How power imbalances can lead to **discrimination**.
- Effective ways to challenge discrimination.
- The difference between online and real-world **identity**.
- Why digital footprints are permanent and traceable.
- The challenges of addressing online harm through law.
- How to **evaluate** your personal growth and impact.

Keywords

Stereotype-An unfair assumption about a group.
Power - Influence over decisions or outcomes.
Discrimination - Unfair treatment based on **identity**.
Digital footprint - Your trace left online.
Anonymity - Being unidentifiable online.
Evaluate - Judge value using evidence.
Empathy - Sharing how someone else feels.

Think Deeper

- How one **stereotype** about you might have formed.
- A law addressing online hate – how effective is it?
- What evidence shows real personal growth?

Go deeper through: your Finding My Voice whiteboard tasks and weekly reflections

Previous Knowledge

Autumn Term 1: values, inclusion and British Values.

We are Reading

The Dark Lady byAkala.
Family, Magic, Loneliness, Race and Class in Elizabethan England.

In Lifeskills

EDI
Equality, Diversity and Inclusion.

Foundations for the Future

Taking Ownership and Action
Get involved. Use failure and feedback to learn, grow and set new goals.

RE – UNIT 2 – Crime and Punishment

Core Knowledge

- There is a debate about whether people are born good or evil and the actions of very evil people are caused by 'nature or nurture'.
- 'The **Problem of Evil**' states that there cannot be an all-powerful (**omnipotent**), all-loving (**benevolent**) God if evil and suffering exist.
- **Christians** respond to The Problem of Evil in many ways, including the Bible story of Job.
- Six reasons for **crime**: Upbringing, addiction, poverty, mental illness, greed/hate, opposition to existing law.
- Three types of crime: Crimes against the person, Crimes against property and Crimes against the state.
- Three aims of punishment: **Retribution**, **deterrence** and **reformation**.
- Treatment of criminals. There is a debate about how criminals should be treated.
- Elizabeth Fry was a Victorian Quaker **Christian** who visited Newgate prison and also campaigned for prison reform.
- Parable of Sheep and Goats: A parable of Jesus which suggests people will be judged on how they have treated 'the least of these', including those in prison.
- There are different religious responses to the issue of **forgiveness**, based on several texts and teachings.
- There are several arguments for and against The **Death penalty**.
- There are a variety of religious responses to the issue of the Death penalty, both between and within **worldviews** such as Christianity and Islam.

Keywords

Crime -An action which breaks the law
The Problem of Evil - A philosophical argument which states that God cannot exist due to the existence of evil and suffering
Opposition to existing law - A belief that the current law is unjust and should be challenged or broken
Crimes against the person - Crimes committed directly against a person e.g. assault, murder
Crimes against property - Crimes committed against property e.g. arson, **car** theft
Crimes against the state - Crimes which affect the smooth running of society on a large scale e.g. terrorism
Deterrence - To put someone off committing a crime
Retribution - Crimes should be punished with a fair and proportionate punishment
Reformation - To change or reform someone's character, so that they don't want to commit crime again
Prison - Removal of freedom as punishment for a crime
Community service - Helping in the community (eg litter-picking) for a set number of supervised hours
Corporal Punishment - Physical punishment (not used in the UK justice system)
Forgiveness - Letting go of blame against a person
The **Death Penalty**/ Capital Punishment Ending someone's life as a punishment for a serious crime (not used in the UK justice system)

RE – UNIT 2 – Crime and Punishment

Think Deeper

Theodicy: An argument which tries to **justify** or explain why an **omnipotent**, **benevolent** God would allow suffering

- Interpretation of Biblical texts such as Job is not always straightforward. Is the story of Job trying to give an explanation for suffering? Or should this ancient text be interpreted differently?
- Three extra aims of punishment: **reparation**, **protection** and **vindication**
- Article about Norwegian prisons- thinking deeply about the question of whether treating criminals with respect, compassion and responsibility could achieve the aims of punishment more effectively.
- Deep thinking about the ethical question of whether it is ever right to break the law. Examples of **Christians** (eg Dietrich Bonheoffer- The Confessing Church) who have felt it it is right to do so in their context.

Revision support

Revision Cards- Theme E- **Crime** and Punishment with questions GP1.pptx

Type and aims of punishment - Crime and punishment - GCSE Religious Studies Revision - WJEC - BBC Bitesize

Video: religious perspectives and punishment.

Previous Knowledge and unit overview

Everyone one of us has a world-view: a way of seeing the world. This will influence what we think about ethical questions of good, evil, and how society should work. This unit will give you chance to express opinions about some interesting and important issues but also to think about why you hold those views.

We will look at religious and non-religious views about **Crime** and Punishment, and develop our understanding of the views of others.

As you discuss, debate, gather factual evidence and form arguments, you will be developing important academic skills. If you go on to study GCSE RE, this forms one of your units of work for the exam, but even if you don't, these skills will still be really useful.

The Problem of Evil and Job





RE – UNIT 2 – Crime and Punishment

Aims of punishment



Reasons for crime



Religious responses to forgiveness



Parable of the Sheep and Goats



SCIENCE – UNIT 3 – Collision Theory

Core Knowledge

The rate of a chemical reaction can be found by measuring the quantity of a reactant used or the quantity of product formed over time
Factors which affect the rates of chemical reactions include:
- the concentrations of reactants in solution
- the **pressure** of reacting gases
- the **surface area** of solid reactants
- the **temperature**
- the presence of **catalysts**

Collision theory explains how various factors affect rates of reactions.
Chemical reactions can occur only when reacting particles collide with each other and with sufficient energy.
The minimum amount of energy that particles must have to react is called the **activation energy**.
Increasing the **concentration** of reactants in solution, the pressure of reacting gases, and the surface area of solid reactants increases the **frequency** of **collisions** and so increases the **rate of reaction**.
Increasing the temperature increases the frequency of collisions and makes the collisions more energetic, and so increases the rate of reaction.
Catalysts increase the rate of reaction by providing a different pathway for the reaction that has a lower activation energy.
Catalysts change the rate of chemical reactions but are not used up during the reaction.

Think Deeper

Mean rate of reaction = quantity of reactant used ÷ time taken.

Mean rate of reaction = quantity of product formed ÷ time taken.

The quantity of reactant or product can be measured by the mass in grams or by a volume in cm3.
The units of rate of reaction may be given as g/s or cm3/s.

Keywords

Activation energy - The minimum amount of energy that particles must have to react.
Catalyst - A substance that increases the rate of a chemical reaction by lowering the activation energy without being used up.
Collision theory - The theory that explains how various factors affect rates of reaction.
Concentration - The mass of solute per given volume of solution, measured in grams per dm3 (g/dm3).
Pressure - The force per unit cross-sectional area for a force acting at right angles to a surface.
Rate of reaction - A measure of how quickly a reactant is used up or a product is formed in a chemical reaction.
Surface area - The total area of the surface of an object.
Temperature - The **average** kinetic energy of the particles in a substance, measured in degrees Celsius (°C).
Volume - The amount of space that a substance or object occupies.

Previous Knowledge

Chemical reactions form new products.
Signs of a chemical reaction include the formation of a gas or a precipitate.
Chemical reactions can occur at vastly different rates.
Whilst the reactivity of chemicals is a significant factor in how fast chemical reactions proceed, there are many **variables** that can be manipulated in order to speed them up or slow them down.

SCIENCE – UNIT 3 – Collision Theory

Calculating Rates of Reactions

Reactions happen at **varying rates**. For example, a firework exploding is a fast reaction whereas a piece of iron rusting would take place over a longer period of time.

The **rate of a chemical reaction** tells us how quickly a **product is formed** or how quickly a **reactant is used up**.

For a chemical reaction to occur, the reactant particles must collide with enough energy. Those collisions that produce a chemical reaction are called successful collisions.

$$\text{mean rate of reaction} = \frac{\text{quantity of reactant used}}{\text{time taken}}$$

$$\text{mean rate of reaction} = \frac{\text{quantity of product formed}}{\text{time taken}}$$

Measuring the Mass of a Reaction Mixture

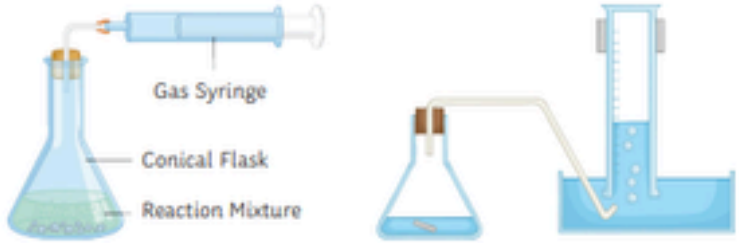
The changing mass of a reaction mixture can be measured during a reaction. This method is particularly useful when gases, such as carbon dioxide, are given off. **Gas escapes during the reaction and the mass of the reaction mixture decreases.** The mass can be measured at regular time intervals.



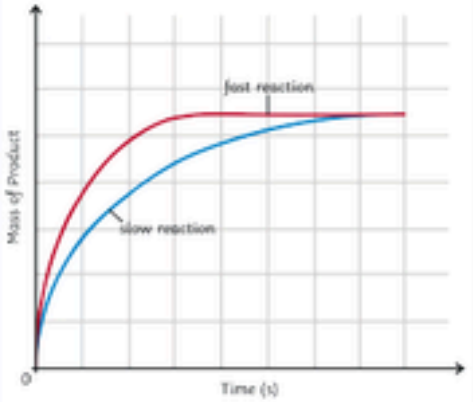
units = g/s or g/min

Measuring the Volume of a Reaction Mixture

The changing volume of a reaction mixture can be measured during a reaction. This method is particularly useful when gases, such as carbon dioxide, are given off. The gas can be collected and its volume measured at regular time intervals. Different types of measuring equipment can be used to collect the gas such as a gas syringe, measuring cylinder or upside-down burette.



units = cm^3/s or cm^3/min



Graphs are a useful way to **analyse** the results from a rate of reaction investigation. The graph above shows two lines, one red and one blue.

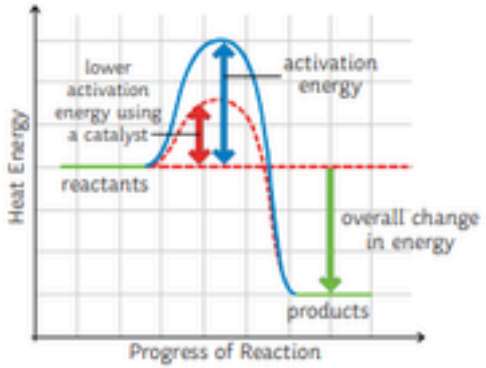
The red line represents a fast reaction and the blue line a slow reaction. We know the fast reaction occurs at a much faster rate as the line is steep. The fast reaction finishes before the slow reaction as the line plateaus sooner.

Factors Affecting the Rate of a Chemical Reaction

- concentration and pressure
- catalyst
- surface area
- temperature

The rate of a chemical reaction will be increased if there are more frequent successful collisions between reactant particles.

Catalyst



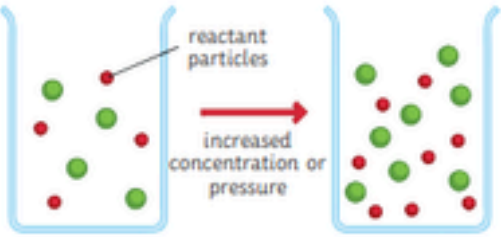
A catalyst is a **substance** that speeds up a chemical reaction without getting used up itself. Catalysts are able to offer an **alternative pathway** at a **lower activation energy**.

Biological catalysts are called **enzymes**.

When a catalyst is used in a chemical reaction (not all reactions have a catalyst that is suitable to use), the **frequency of collisions** is **unchanged**. More **particles** are able to react. The particles have **energy greater** than that of the **activation energy**. Consequently, there is in an **increase** in the **rate successful of collisions**.

Concentration and Pressure

If the **number of reactant particles** in a given space is **doubled**, there will be **more frequent successful collisions** between reactant particles, therefore, **increasing** the **rate of reaction**.



Collision Theory: factors affecting reaction rate

SCIENCE – UNIT 4 – Atomic Structure and the Periodic Table

Core Knowledge

- Identify the subatomic particles in an **atom** and state their relative charges and masses.
- Describe the **structure** of an atom as a **nucleus** surrounded by electrons in energy levels.
- Calculate the numbers of protons, neutrons and electrons using atomic and mass numbers.
- Represent the electronic structures of the first twenty elements.
- Explain how elements are arranged in the **periodic table** by **atomic number**.
- Relate an element's position in the periodic table to its **electron** arrangement and properties.
- Compare the properties of metals and non-metals using their atomic structure.
- Describe how to separate mixtures of substances using **filtration**, **evaporation**, **crystallisation**, **distillation**, and **chromatography** .

Think Deeper

- **Evaluate** how new experimental evidence led scientists to revise models of the **atom**.
- Analyse the evidence from Rutherford's alpha scattering experiment and its conclusions.
- Calculate relative atomic mass using **isotope** abundance data.
- **Justify** why Mendeleev left gaps and reordered elements when developing the **periodic table**.
- Predict outcomes of halogen displacement reactions using trends in reactivity.

Keywords

Atom: Smallest part of an element that can exist.
Nucleus: Dense central part of an atom containing protons and neutrons.
Proton: Positively charged particle found in the nucleus.
Neutron: Uncharged particle found in the nucleus.
Electron: Negatively charged particle found in energy levels around the nucleus.
Atomic number: Number of protons in an atom.
Mass number: Total number of protons and neutrons in an atom.
Isotope: Atoms of the same element with different numbers of neutrons.
Periodic table: Arrangement of elements by atomic number showing repeating properties.
Ion: Charged particle formed when an atom gains or loses electrons.

Previous Knowledge

- Recognise that all materials are made from particles.
- Describe the differences between elements, compounds and mixtures.
- Use chemical symbols to identify common elements.
- Recall that substances can have physical and chemical properties.
- Understand that particles can be arranged and move differently in solids, liquids and gases.

SCIENCE – UNIT 4 – Atomic Structure and the Periodic Table

Unit Overview

The periodic table provides chemists with a structured organisation of the known chemical elements from which they can make sense of their physical and chemical properties.

The historical development of the periodic table and models of atomic structure provide good examples of how scientific ideas and explanations develop over time as new evidence emerges.

The arrangement of elements in the modern periodic table can be explained in terms of atomic structure which provides evidence for the model of a nuclear atom with electrons in energy levels.

Revision Support

Atomic **structure** and the **periodic table** - GCSE

Combined Science - BBC Bitesize
https://www.bbc.co.uk/bitesize/topics/zcckk2p

SCIENCE – UNIT 4 – Atomic Structure and the Periodic Table

Atomic structure and the periodic table: reference

Atoms

Contained in the nucleus are the **protons** and **neutrons**. Moving around the nucleus are the **electron** shells. They are negatively charged.

Particle	Relative Mass	Charge
proton	1	+1
neutron	1	0
electron	Very small	-1



Overall, atoms have no charge; they have the same number of protons as electrons. An ion is a charged particle - it does not have an equal number of protons to electrons.

Atomic Number and Mass Number



Elements

Elements are made of atoms with the same atomic number. Atoms can be represented as symbols.

N = nitrogen **F** = fluorine **Zn** = zinc **Ca** = calcium

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

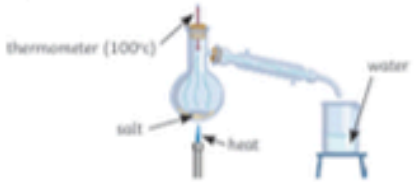
Isotope	Protons	Electrons	Neutrons
$^{1}_{1}H$	1	1	1 - 1 = 0
$^{2}_{1}H$	1	1	2 - 1 = 1
$^{3}_{1}H$	1	1	3 - 1 = 2

Compounds – a compound is when two or more elements are chemically joined. Examples of compounds are carbon dioxide and magnesium oxide. Some examples of formulas are CO_2, NaCl, HCl, H_2O, Na_2SO_4. They are held together by chemical bonds and are difficult to separate.

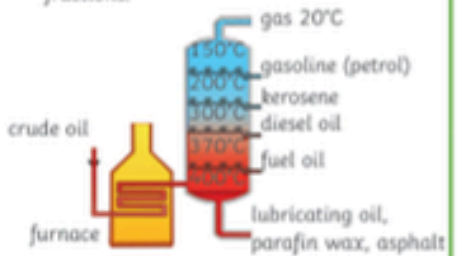
Distillation

To separate out mixtures of liquids.

1. **Simple distillation** – separating a liquid from a solution.



2. **Fractional distillation** – separating out a mixture of liquids. Fractional distillation can be used to separate out crude oil into fractions.



Metals and Non-metals

They are found at the **left** part of the periodic table. Non-metals are at the **right** of the table.

Metals

Are strong, malleable, good conductors of electricity and heat. They bond metallically.

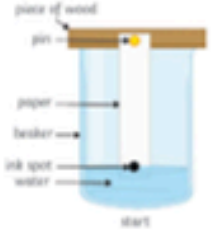
Non-Metals

Are dull, brittle, and not always solids at room temperature.

Mixtures, Chromatography and Separation

Mixtures – in a mixture there are no chemical bonds, so the elements are easy to separate. Examples of mixtures are air and salt water.

Chromatography – to separate out mixtures.



Filtration – to separate solids from liquids.



Evaporation – to separate a soluble salt from a solution; a quick way of separating out the salt.



Crystallisation - to separate a soluble salt from a solution; a slower method of separating out salt.



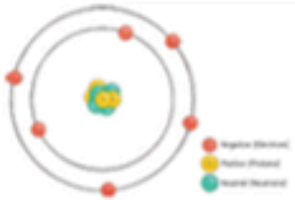
Separating out salt from rock salt:

1. Grind the mixture of rock salt.
2. Add water and stir.
3. Filter the mixture, leaving the sand in the filter paper
4. Evaporate the water from the salt, leaving the crystals.

Activate W
Go to Setting

Electronic Structure

Electrons are found in shells. A maximum of two in the most inner shell, then eight in the 2nd and 3rd shell. The inner shell is filled first, then the 2nd then the 3rd shell.



SPANISH – UNIT 2 – Holidays and Travel

Core Knowledge

- Use '**me gusta**(n)/ me gustaría + **infinitive**'
- Know key phrases for describing a photo (see link to vocab list)
- Use comparatives to describe travel plans
- Use 'se puede(n) + infinitive'
- Use the superlative – 'el/la/los/las + noun + más/menos + adjective'
- Use 'if' clauses with the **present tense**
- Use 'acabar de + infinitive' and 'suelo + infinitive'
- Use the preterite tense to say what you did on a holiday in the past
- Use the **imperfect tense** to describe things in the past

Think Deeper

- Use past,present and future tenses together
- Use the **plural** form of: Preterite tense of -ar/-er/-ir verbs
- Use the plural form of: **Imperfect tense** of -ar/-er/-ir verbs
- Use clues, cognates, context and common sense to work out meanings of unfamiliar language

Keywords

Where would you like to go on holiday? - ¿Adónde te gustaría ir de vacaciones?
Which is the most fun festival? - ¿Cuál es la fiesta más divertida?
How was your last holiday? - ¿Qué tal tus últimas vacaciones?
What did you do? - ¿Qué hiciste?
Where did you stay? - ¿Dónde te quedaste?
What was the best thing about your holiday? - ¿Qué fue lo mejor de tus vacaciones?

Previous Knowledge

In this unit you will deepen your knowledge of the present, preterite and near future tenses when talking about travel, holidays and cultural experiences.

You will develop your ability to describe past trips, discuss travel preferences and future plans, and express more detailed opinions about destinations, transport and holiday activities.

SPANISH – UNIT 2 – Holidays and Travel

Structures of frequency and recent actions

Diría que…	Hace	sol	frío	
Desde mi punto de vista…		viento	buen tiempo	
Creo que…		calor	mal tiempo	
Pienso que…				
En mi opinión…				
Me parece que…	Llueve		Nieva	

Continente	Zona	Viajeros	Estación
a África	e costa	i solo/a	m primavera
b Asia	f campo	j pareja	n verano
c Europa	g ciudad	k grupo de amigos	o otoño
d Latinoamérica	h montaña	l familia	p invierno

Actividades

q hacer deportes · r hacer turismo · s ir de compras · t disfrutar de la … · u tomar el sol · v probar platos típicos

Remember that **ll** has a similar sound to 'y' in English.
Listen and repeat the words.
llevan las Fo**ll**as orgu**ll**oso



avión tren
barco autobús
pie coche

ir/viajar **en** [avión]
coger **el** [avión]
Note: ir **a** pie



To say that you have just done something, use the present tense of ***acabar de*** + infinitive.

Acabo de *volver de España.*
I have just returned from Spain.

Acabamos de *visitar Sevilla.*
We have just visited Seville.

Use a variety of structures to give opinions about activities in the past:

(No) Me/Nos gustó. Me/Nos encantó.	Fue … genial. increíble.
Lo pasé … bien/mal/fatal.	¡Qué … desastre! suerte!

El primer día …	Al día siguiente …	El último día …	Lo peor fue cuando …		
comí algo malo y vomité.	me puse enfermo/a.				
dejé / perdí / rompí	mi bolsa	mi cámara	mi maleta	mis llaves	
	mi reloj	mi pasaporte	mi tarjeta de crédito		
en	el aeropuerto.	la playa.	el autobús.	la estación.	
¿Qué tiempo hizo?	Hizo	buen tiempo / mal tiempo. color/frío/sol/viento.			
	Llovió/Nevó.				

SPANISH – UNIT 2 – Holidays and Travel

Holiday destinations and activities

Escuchar 1

Match each question to the correct section of this holiday planning website. Then listen and write down the five correct letters (a–v) for each person. (1–4)

1 ¿**Adónde** te gustaría ir de vacaciones?
2 ¿**Cuándo** te gustaría ir?
3 ¿**Qué tipo** de destino te gustaría visitar?
4 ¿**Con quién** te gustaría viajar?
5 ¿**Qué** te gustaría hacer?



SPANISH – UNIT 2 – Holidays and Travel

Travel preferences and reasons

Leer 4

Read the opinions about how people prefer to travel. Fill in the gaps with the correct word from the word box below. Then translate the phrases in bold into English.

¿Cómo te gustaría viajar?

Me gustaría viajar en **1** porque **es más seguro que** el barco y hay muchas tiendas en el aeropuerto donde se puede ir de compras antes del vuelo. ***Carlos***

Quisiera viajar por la ciudad a **2** porque me gusta hacer ejercicio y **es mejor que** coger el autobús o el metro. También **es más sostenible que** viajar en coche, y además siempre hay mucho tráfico. ***Luis***

Me gustaría ir en **3** porque vivo cerca de la estación. **Es más cómodo que** el autobús para distancias largas, aunque **no es tan rápido como** el avión. También se pueden hacer otras cosas durante el viaje. Sin embargo, actualmente hay muchas huelgas y muchos retrasos. ***Bea***

No me gusta viajar en autobús porque la otra gente me molesta – prefiero viajar sola. Me gustaría ir en **4** porque siempre tengo mucho equipaje, y por eso **es más práctico que** el transporte público. ***Irene***

Me gustaría ir en **5**, ya que me encanta el mar y tengo



avión tren
barco autobús
pie coche

*ir/viajar **en** [avión]*
*coger **el** [avión]*

Note: ir **a** pie

SPANISH – UNIT 2 – Holidays and Travel

Opinions and the preterite tense

Módulo 2

1 **In pairs, take turns to give your opinion of different festivals.**

- *En tu opinión, ¿cuál es la fiesta más divertida/interesante/histórica (etc.)?*
- *Para mí, la fiesta más ... es la Feria de Abril porque llevan/comen ... (etc.)*
- *¿Cuándo es la Feria de Abril?*
- *Es ... Y en tu opinión, ¿cuál es la fiesta más ...?*

Remember that **ll** has a similar sound to 'y' in English.
Listen and repeat the words.
***ll**evan las Fa**ll**as orgu**ll**oso*

2 **Translate this text into Spanish.**

Superlatives - take care with word order.

el Carnaval

Look back at page 34.

Hay que + infinitive

One of the most popular festivals is Carnival, which they celebrate in February or March in lots of Spanish-speaking countries. If you visit Latin America, you must go to Barranquilla in Colombia, where you can see the best parades. Also, you can try the tastiest dishes.

STEAM – Automata

Core Knowledge

- Name **motion** types and explain linkages
- Use **isometric drawing**
- Explain how cams convert motion
- **Manufacture** a wooden frame accurately and safely
- Build and test a **crankmechanism**
- Develop ideas through prototyping
- Shape and refine a wooden component
- **Evaluate** a product and process

Previous Knowledge

Workshop **safety**; saws, bench hooks, steel rulers and carpenters squares; half-lap joints; material families and properties: wood, metals and plastics.

Why this project?

Develop practical design, making and evaluation skills. Design, make and test products while applying technical knowledge and problem-solving skills.

Keywords

Motion; **Rotary**; **Linear**; **Oscillating**; **Reciprocating**

Linkage; **Pivot**; **Lever**; **Cam**; **Follower**

Crank; **Axle**; **Mechanism**; **Prototype**; Design

Manufacture; Measure; Marking; Cut; Drill

Sanding; Shape; Refine; Assemble; Test

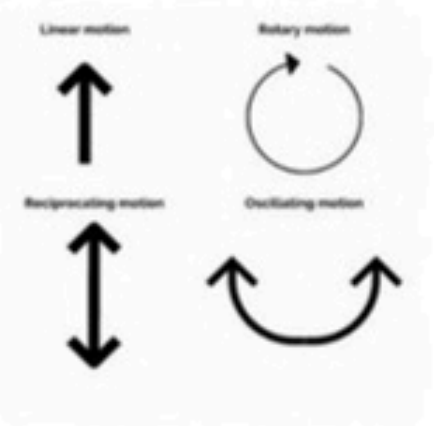
Evaluate; **Accuracy**; **Safety**; **Function**; **Improvement**

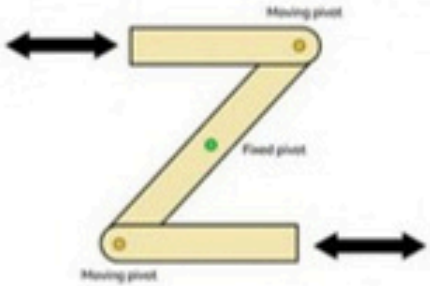
Think Deeper

- Build a reverse **motionlinkage** and move the fixed **pivot**. Explain how this changes the **range** and type of motion.
- Find a real **mechanism** with a similar linkage or pivot. Describe or sketch it and identify its motion.
- Why reduce **friction**? Name two methods for your automata.
- Describe a testing problem, its cause and how you could fix it.
- Create another model, make one **improvement** and explain the change.

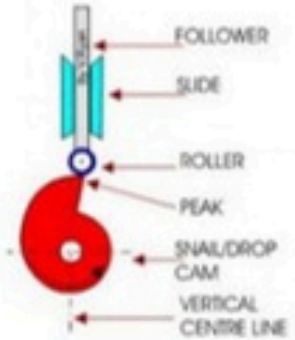
STEAM – Automata

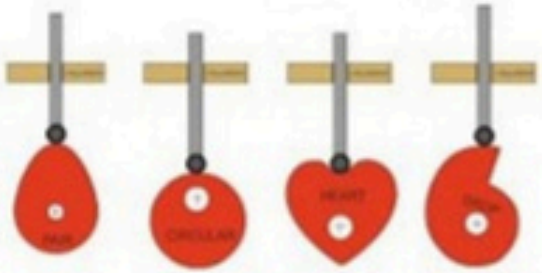
Motion and linkages





Cams convert motion





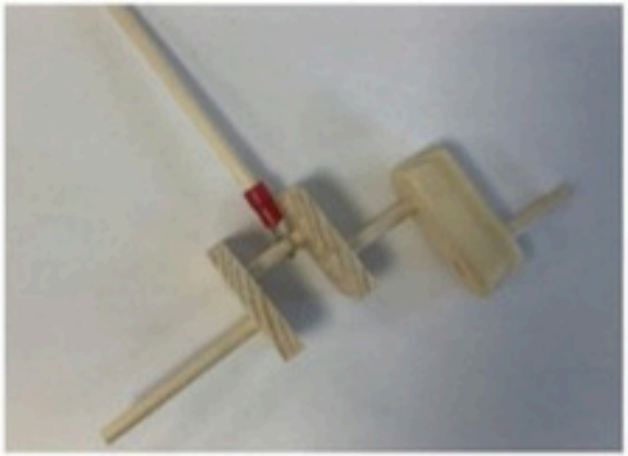
Manufacture a wooden frame



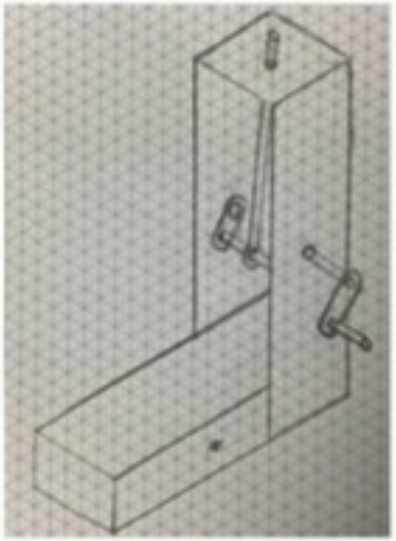




Build and test a crank

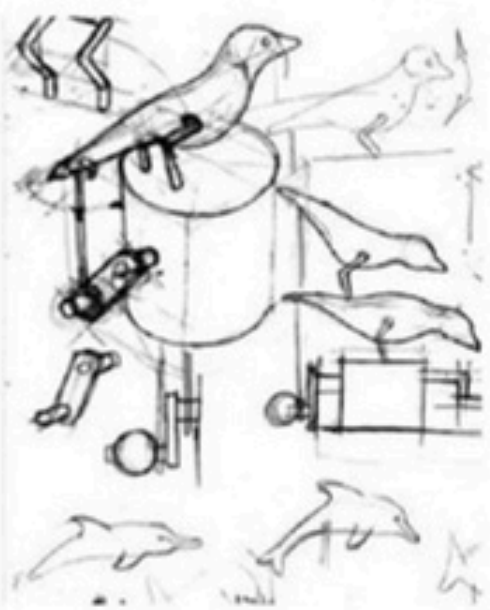


Isometric drawing



STEAM – Automata

Develop ideas through prototyping





Prototype, test and improve

Develop ideas by modelling. Test how the **mechanism** moves, identify problems and improve your design.

Shape and refine a wooden component



Evaluate the product and process: ACCESSFM



STEAM – Cybersecurity

Core Knowledge

By the end of this unit you will know ...

- Cybersecurity protects devices, networks and data from unauthorised access, damage or theft — and is one of the UK's fastest-growing career sectors.
- The Computer Misuse Act 1990 makes unauthorised access, access with intent, and unauthorised modification of computer systems illegal.
- Malware (viruses, trojans, spyware, ransomware) and social engineering (phishing, smishing, pharming) both exploit weaknesses — one technical, one human.
- Strong passwords are long and unique; 2FA adds a second layer using something you know, have, or are.
- Every device has a unique IP address similar to a mobile phone number.
- Web addresses get looked up in a system like a phone book called the DNS. The DNS identifies the IP for a given web address.
- Encryption scrambles data with a key, hashing checks integrity, and ciphers such as Caesar and Vigenère encode messages.

Think Deeper

- Malware that has not previously been discovered is called a zero-day attack. As soon as it happens specialists fight back by recording it's signature so they can spot it again.
- A public IP address reveals an approximate location, but never an exact one, only the police can track a precise location. Penetration Testers (aka ethical hacker, white hat) use the same techniques as malicious hackers, but with permission, to find and fix security flaws.

Keywords

Cybersecurity	Malware	Computer Misuse Act	Social Engineering
Phishing	Pharming	Smishing	Password
2FA	IP Address	DNS	DHCP
Encryption	Cipher	Hashing	Geolocation

Previous Knowledge

In Y7/Y8 you covered basic e-safety and used Office 365 for digital work — this unit builds on that with the laws, threats and defences behind cybersecurity.

Why this Project?

Cybersecurity protects the systems, money and safety of everyone — from hospitals to your own accounts online — and is one of the UK's fastest-growing career sectors.

STEAM – UNIT 1 – Cybersecurity

The Law & Malware

Mal = Bad
Software = computer program
Malware = bad program



The Computer Misuse Act makes these three actions illegal. **Malware** — viruses, trojans, spyware, ransomware — exploits the same systems.

Passwords & 2FA

Know the password | Have the device | Are the person you say

2FA combines something you know, have, and are — far stronger than a password alone.

2 Factor Authentication

Networking & IP



Every device has a unique IP address. DNS translates a web address into the IP address that lets devices find each other.

Staying Safe Online



Combining strong passwords, 2FA, safe Wi-Fi use and trusted payment systems keeps your accounts and devices secure.

Social Engineering



phishing • smishing • pharming

All three trick a person into clicking a link or sharing details — often using urgency or false trust.

Encryption & Ciphers

plain: HELLO

cipher: KHOOR

Caesar shift = 3

Encryption and ciphers scramble data so only someone with the correct key can read it. A Caesar cipher shifts each letter by a fixed number.

STEAM – UNIT 1 – Engineering

Core Knowledge

By the end of this unit you will know ...

- Different Engineering disciplines and how people who work in them are qualified and trained
- Forces acting on structures and the names of structural elements
- How to analyse basic trusses
- Orthographic drawing conventions and symbols
- Advanced Solidworks tools (Loft, Sweep, Revolve, constraints)
- Know what an aerofoil is and how it generates lift
- How we generate electricity from the wind, basic elements of a generator and how it works

Why this Project?

In this set of lessons you will be learning more about engineering as a career path. You will also be gaining knowledge and skill in the use of CAD, structures, renewable energy production and aerodynamics.

Previous Knowledge

- You have used different drawing conventions across year 7 and 8, and used different design tools at a basic level. In this unit you will be developing more advanced skills and knowledge which will allow you to solve more complex problems as an engineer.
- You know about STEAM career paths but this unit will specifically focus on Engineering roles and how you could become trained and qualified in that area.

Keywords

Term	Meaning
Tension	Pulling force that stretches a material
Compression	Pushing or squeezing force that shortens a material
Torsion	Twisting force acting on an object
Shear	Force that causes parts of a material to slide past each other
Truss	Triangular framework used to support loads efficiently
Strut	Structural member designed mainly to resist compression
Weight	Force acting on an object due to gravity (measured in N)
Mass	Amount of matter in an object (measured in kg)
Load	Any force acting on a structure or component
Aerofoil	Wing-shaped profile designed to generate lift in moving air
Or thographic	2D technical drawing showing different views of a 3D object
Generator	Device that converts mechanical energy into electrical energy

Think Deeper

- Applying knowledge in increasingly complex situations requiring inference and exploration
- Simulation of the impact of applied forces in Solidworks
- Efficiency and stress calculations

STEAM – UNIT 1 – Engineering

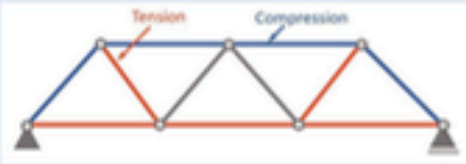
Engineering disciplines



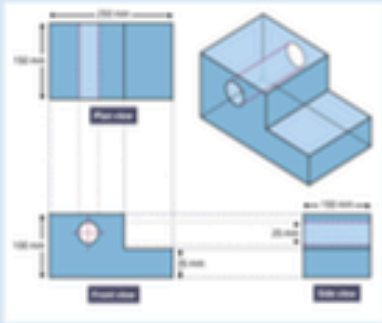
Forces in engineering



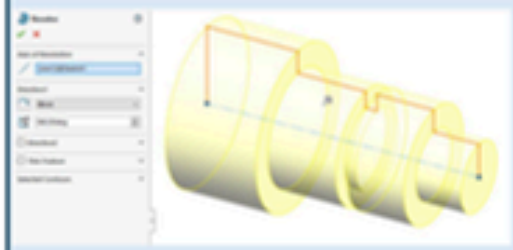
Analysing structures



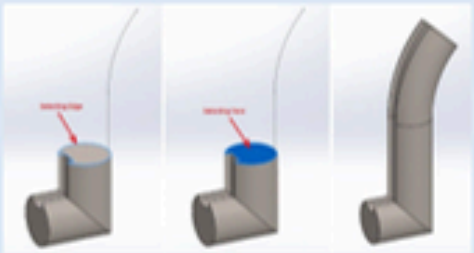
Orthographic drawing



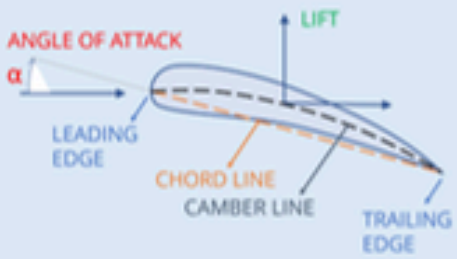
Revolve



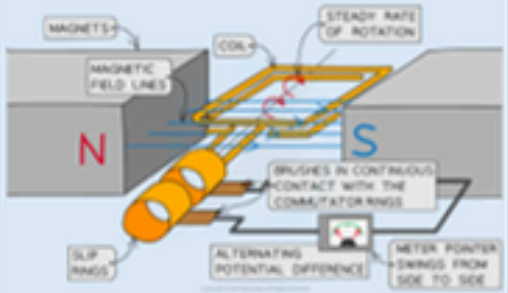
Sweeping



Aerofoils



Generating electricity



STEAM – Enterprise and Marketing

WHY THIS PROJECT? This Unit looks at many aspects of starting and running a business & how real-world business works. You will write a business plan, create a brand, market and cost your proposed business. You will then pitch your business idea to an investor

CORE KNOWLEDGE

By the end of this unit you will know

- How to write and develop a business proposal
- That a target Market is who your product or service is aimed at
- What a USP is and how to apply it to your target market
- What branding is and how to apply it to your business
- How to create an effective logo that is suitable for your business
- How to apply your logo and its variations across marketing material
- How to use Excel effectively to predicts costs & pricing for your business
- How to present an effective pitch for your proposed business to a potential investor

Previous Knowledge

- Use of PowerPoint
- Use of typography and colour
- Persuasive writing

KEYWORDS

Business proposal	Branding	Variation	Excel	Psycographic	Archetype
Target Market	Logo	Typography	Revenue	Forecast	Typical
USP	Application	Colour Theory	Pricing	Budget	Loyalty
Profit	Loss	Investor	Pitch	Income	
Values	Reputation	Product	Service	Overheads	
Formula	Variable	Fixed costs	Demographic	Trends	

Stretch

- I can evaluate the strengths and weaknesses of a business proposal and recommend improvements to increase its chances of success
- I can create detailed customer profiles (buyer personas) to improve marketing effectiveness.
- I can develop a USP that clearly differentiates a business from its competitors.
- I can explain how a brand's values, personality, and visual identity work together to create a strong market presence.
- I can justify design decisions by linking logo features to business values and target audience preferences.
- I can adapt logo versions for digital, print, social media, and merchandise whilst maintaining brand identity.
- I can use formulas, functions, and charts to analyse trends and support business decision-making.
- I can use persuasive communication techniques and supporting evidence to strengthen my argument

STEAM – Enterprise and Marketing

Writing A business Proposal

A **business proposal** is a document or presentation that explains a product, service, or idea and persuades a potential client, customer, investor, or partner to take action, such as buying, investing, or collaborating.



Identifying a Target Market for your product / service

A **target market** is the specific group of people or organisations most likely to buy a product, service, or support an idea.



Unique Selling Point

A **USP (Unique Selling Proposition)** is the feature that makes a product or business different from its competitors.



Branding & Logo Design

Branding is creating a recognizable identity that makes a business memorable and distinctive.

A **logo** is a visual symbol that represents a business, brand, or organisation.



Excel

Microsoft Excel helps organize data, track finances, and analyse business performance efficiently.



Presentation Pitch

To pitch a business idea, you need confidence, clear communication, product knowledge, and persuasion skills to explain and sell your idea effectively. You will need to know what information is relevant to **present**





STEAM – UNIT 1 – Python Programming

Core Knowledge

By the end of this unit you will know ...

- a variable is a named place in memory that stores a value which can change while a program runs, and must be given a value before it is used.
- a for loop repeats a block of indented code a set number of times, using its counter (e.g. i) to calculate a different position each repeat.
- a nested loop (a loop inside a loop) produces a grid, and the modulo operator (%) finds a remainder, used to test if a number is odd or even.
- a function is a named, reusable block of code that can accept parameters, so the same code can produce different results.
- a list stores several values in order, each with a numbered index from 0, and can grow using .append(); random.choice() picks one at random.
- there are three types of programming error — syntax, runtime and logic — and the error message shows the type and the line it occurred on.

Think Deeper

- Write your own function with two or more parameters and call it with different values.
- Combine a for loop, a list and random.choice() into a working quiz bot.
- Use the modulo operator to stagger a grid pattern, like the stars on a flag.
- Read an unfamiliar error message and identify the type and cause yourself.

Keywords

Variable	Loop	Function	Parameter
Nested loop	Modulo	Index	List
append()	random.choice ()	while loop	if/elif/else
Syntax error	Runtime error	Logic error	Debug

Previous Knowledge

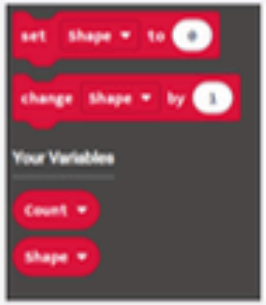
In Year 7 and 8 you used block-based programming (Scratch) and simple micro:bit control. This unit moves to Python — a text-based language where you type exact instructions yourself.

Why this Project?

You'll learn to write real Python code — using variables, loops and functions to solve drawing problems and build the American flag — before combining everything to build your own interactive chatbot.

STEAM – UNIT 1 – Python Programming

Variables



A variable is a labelled box that holds a value — and that value can change.

Loops

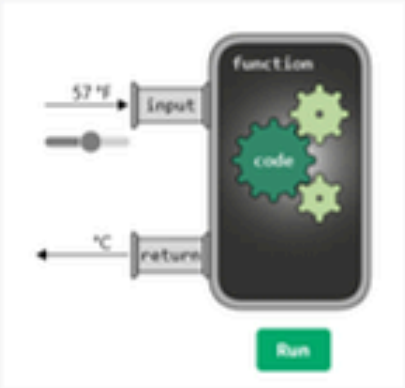
Repeating a function.

Definite (5 times)

Indefinite (while temperature is more than 30 degrees)

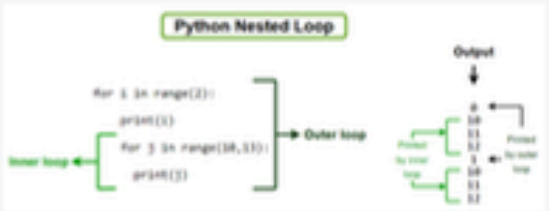


Functions



A function takes in parameters and produces the same output every time it's called.

Nested Loops & Modulo



A nested loop draws a grid; % (modulo) tests odd/even rows to stagger them.

Lists & Randomness





A list stores items by index (from 0); random.choice() picks one at random.

Debugging



Read the error type and line number first — that's where the fix usually is.

SAFEGUARDING

Penryn College
Belong | Aspire | Succeed

We are here to ensure everyone is as safe as they can be. If you have a worry about anyone's well-being or a concern about something you have seen or heard, please let us know.

We are located in the Key Stage Hubs.

Or you may report a concern by using the **@Talk App** on your iPad

REMEMBER OUR SAFEGUARDING LEADS ARE...



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DESIGNATED SAFEGUARDING LEAD



MRS EDGSON

DEPUTY DESIGNATED SAFEGUARDING LEAD



MRS MCGEE-HARRISON

EDUCATION WELFARE OFFICER



MRS COLLINS

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