



Bishop Ullathorne Catholic School Knowledge Organiser

Year 9
Autumn Term
2023-2024

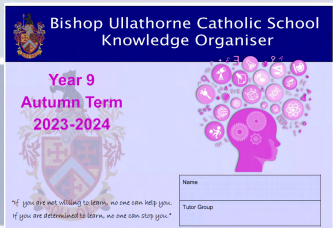
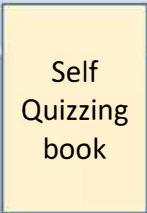


*"If you are not willing to learn, no one can help you.
If you are determined to learn, no one can stop you."*

Name

Tutor Group

Your Knowledge Organiser and Self Quizzing Book

Knowledge Organisers	Self Quizzing Book	The 'Look Cover Write Check' method
		
Knowledge Organisers contain critical, fundamental knowledge that you MUST know in order to be successful in Year 9 and subsequent years. They will help you recap, revisit and revise what you have learnt in order to move the knowledge within from your short-term memory to your long term memory. You must keep all of your Knowledge Organisers and Self Quizzing books at home because the fundamental knowledge required in Year 9 will also be required in Year 10 to 11.	This is the book that you should write in to complete your Knowledge Organiser Home Learning. You do not need to bring this to school. Follow the simple rules on the right about how to use your Knowledge Organiser. You can also watch the video on our Home Learning webpage for more ideas on how to use the Knowledge Organiser. You will be tested as a starter activity in your lesson on the day that the Home Learning is due. This will be completed in your normal exercise book and you will mark it in class.	Step 1 Check Class Charts for what section your teacher has set you to learn for your Home Learning. Step 2 Write the title of the section in your Self Quizzing Book . Step 3 Write out the section that you have been asked to learn. Step 4 Cover up the section in your Self Quizzing book. Read it, Cover it, Say it in your head, check it...REPEAT until confident. Step 5 Cover up the section and write from memory in your Self Quizzing book. Step 6 Check your answers and correct where required. Repeat steps 4 to 6 until you are confident.

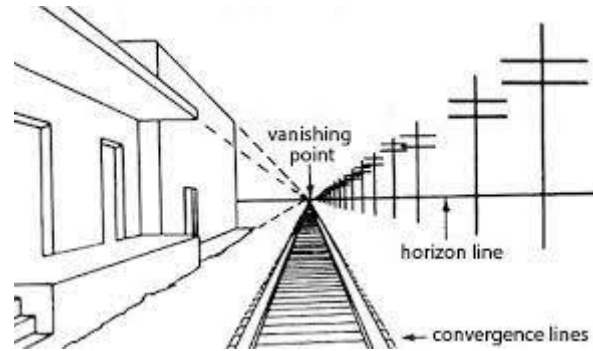
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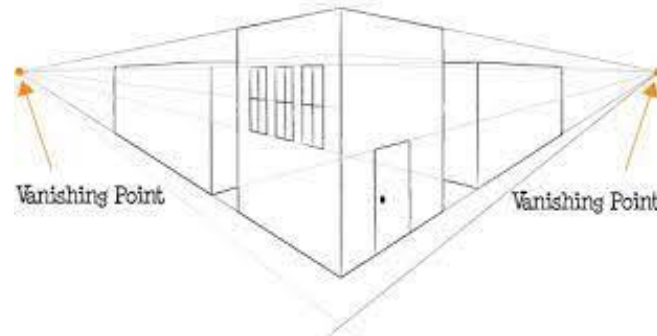
Knowledge Organiser – Year 9- Perspective- Fantasy cityscape using 2 point perspective

Formal Elements	The parts used to make a piece of artwork.
Perspective	A system for representing objects in three-dimensional space on the two-dimensional surface of a picture.
One- point or linear perspective	A drawing has one-point perspective when it contains only one vanishing point on the horizon line.
2- point perspective	two vanishing points from your point of view.
Landscape/cityscape	. the depiction of natural scenery and the depiction of architectural views
convergence	In linear perspective, all lines that are parallel converge together as they run along to a point at a person's eye level
Horizon line	In a drawing or painting, the horizon line is the point where the earth meets the sky. It is always at eye-level—no more and no less
Parallel lines	parallel lines can be defined as two lines in the same plane that are at equal distance from each other and never meet.
convex	A shape or object is said to be convex when it is curved outward.

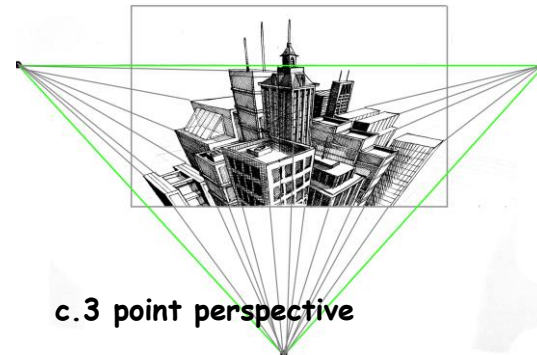
a. 1 point perspective



Pietro Perugino's use of **linear perspective** in this fresco at the Sistine Chapel (1481-82) helped bring the Renaissance to Rome.



b. 2 point perspective



c. 3 point perspective



Convex image by M.C.Escher



Syd Mead-futuristic cityscapes



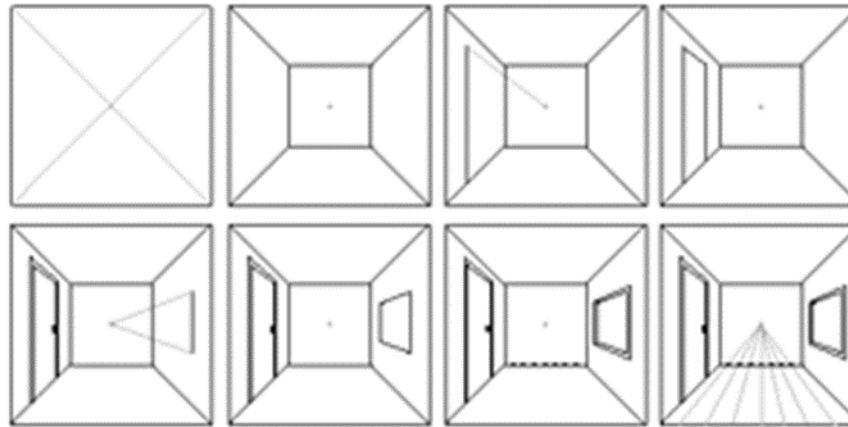
Steven Wiltshire

Home learning tasks:

1. Artist research
2. Plan for final outcome
3. 3 point perspective of street corner

Surrealism	a 20th-century avant-garde movement in art and literature which sought to release the creative potential of the unconscious mind, for example by the irrational juxtaposition of images.
Scale	When an artist or designer chooses to make particular objects oversized or miniature, it is often to emphasize their importance or encourage a new perspective.
proportion	When an artist or designer chooses to make particular objects oversized or miniature, it is often to emphasize their importance or encourage a new perspective.
Juxtaposition	The act of positioning close together (or side by side) and comparing them.
conscious	Knowing and perceiving. When your fully aware when doing stuff
unconscious	. Not conscious. Un-aware of surroundings. Holds your thought and feelings.
Transformation	The act of changing in form or shape or appearance. Turning something familiar to unusual or strang
iconography.	An iconography is a particular range or system of types of image used by an artist or artists to convey particular meanings.

a. 1 point perspective room



b. Surrealism

Characteristics of surrealism:

- Elements of surprise
- Unexpected juxtapositions
- Distortions of reality
- Dreamlike subject matter
- Interest in the subconscious
- Magical and instinctive



Salvador Dali
Spanish painter B: 11 May 1904,
D:23 January 1989.
'The Persistence of Memory' was completed in August 1931, and is one of the most famous Surrealist paintings

Automatism art

Rene Magritte



Salvador Dali



Joan Miro -



Home learning tasks:

1. Bedroom in one point perspective.
2. Observational drawing of three everyday objects
3. Artists study
4. Plan for final piece



Year 9 Computer Science – Computational Thinking



Data Types

Data Type	Meaning
Integer	whole number e.g. 1,2,3,4
Real	Decimal number e.g. 1.2, 3.7
Character	A single character e.g. %, (, &
String	Ordered sequence of characters
Boolean	Produces a TRUE or FALSE output – AND, OR, NOT

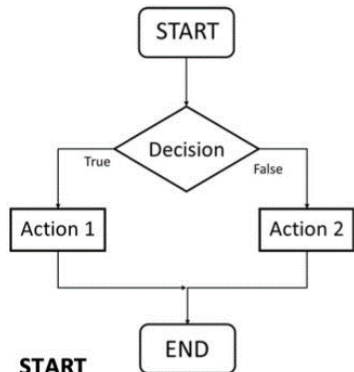
Boolean Operators

Operator	Meaning
>	Greater than
<	Less than
==	Equal to
!=	Not equal to
AND	Both conditions are true
OR	At least one condition is true

Key Words

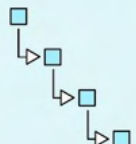
Key Word	Meaning
Computational Thinking	The ability to solve problems logically
Variable	A memory location where values are stored – locally or globally
Sequence	A set of instruction or actions in order
Selection	A decision which has one input and two possible answers
Iteration	Repeating actions a number of times (FOR) or until a condition is met (WHILE)
Syntax Errors	Mistakes in the way the code is written
Logic Errors	The logic is correct but the output is wrong
Runtime Errors	When a program is asked to do something it cannot – it crashes
Debugging	Identification and amendment of errors

Selection (IF)

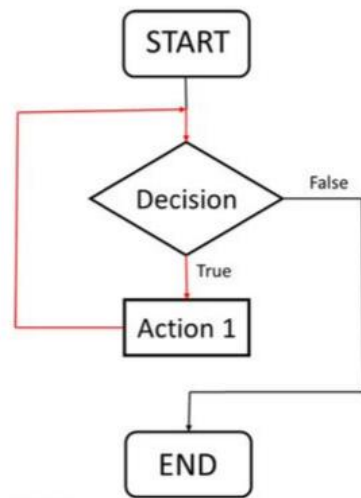


START
IF Decision = TRUE
Go to Action 1
ELSE
Go to Action 2
END IF
END

SEQUENCES

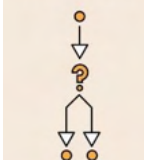


WHILE Loop

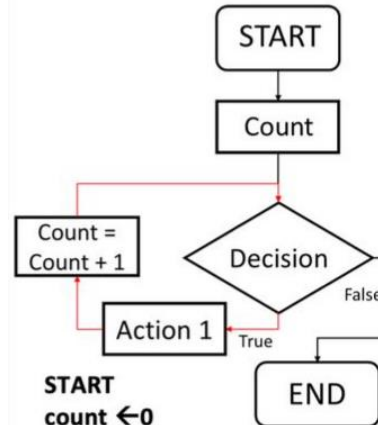


START
WHILE Decision = TRUE
Go to Action 1
END WHILE
END

SELECTIONS



FOR Loop



START
count ← 0
REPEAT
Go to Action 1
count ← count + 1
UNTIL Decision is TRUE
END

LOOPS

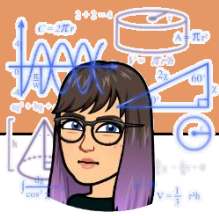


Computational Thinking

Decomposition	Pattern Recognition	Abstraction	Algorithm Design
Breaking down a problem into smaller, more manageable parts	Looking for similarities within problems	Focus on the important information only, ignoring irrelevant details	The creation of a step by step solution to the problem

Mathematical Operators

Addition	Subtraction	Multiplication	Division
+	-	*	/



Year 9 Computer Science – Programming



Basic Python Functions

Function	Use	Example Code
Input	The input function is used to prompt the user to enter some data using the keyboard. input can take a string argument which is used as a prompt to the user to tell them what data the computer is expecting.	<pre>name = input("What is your name?") age = int(input("What is your age?"))</pre>
Output	The print function is used to write output to the screen. print takes one or more arguments (strings or variables between the brackets) and writes the data to the screen.	<pre>print("Hello World!") print("Hello", name, "nice to meet you")</pre>
Variable Assignment	Variable assignments are instructions for the computer. This means that the data stored in a variable can change throughout the runtime of the program.	<pre>name = "Bob" total = 20 + 50 + 35</pre>
Random Numbers	When you want to generate a random number in your program you can make use of the random library.	<pre>import random myRandomNumber = random(1, 6)</pre>

Keywords

Keyword	Definition
Algorithm	Step by step instructions to solve a given problem
Pattern Recognition	Looking for similarities or characteristics that can help solve the problem
Decomposition	Breaking the problem down into smaller problems to solve
Abstraction	Removing aspects that are not required to solve the problem
Selection	A choice built into the program to determine the next section of code to execute based on the output to a set condition
Sequence	The order the program code must be in to work correctly
Repetition	A loop of a set section of the program code
Variable	A single temporary storage location within the program code that can be changed or edited
Function	A set of instructions that are given a name and only when this name is called in the main program, is it executed

Sequence

A program which is executed line by line

```
1# -*- coding: utf-8 -*-
2"""
3Created on Thu Dec 28 22:53:20 2017
4
5@author: Philippe BOULANGER
6"""
7from math import cos, sin, pi
8
9
10def create(nb):
11    step = pi / nb
12    var = ( ( i, step * i ) for i in range( nb+1 ) )
13    values = [ ( i, x, cos(x), sin(x) ) for i, x in var ]
14    with open( "concat_test.csv", "w" ) as file:
15        for t in values:
16            text = ""
17            for i, v in enumerate(t):
18                if i != 0:
19                    text += ','
20            text += str( v )
21            file.write( text + "\n" )
22
23nb = 1000000
24create( nb )
```

Selection

A program which makes a choice or decision

```
1# -*- coding: utf-8 -*-
2"""
3Created on Thu Dec 28 22:53:20 2017
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5@author: Philippe BOULANGER
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20            text += str( v )
21            file.write( text + "\n" )
22
23nb = 1000000
24create( nb )
```

Iteration

A program which repeats a number of times or until a condition is met

```
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20            text += str( v )
21            file.write( text + "\n" )
22
23nb = 1000000
24create( nb )
```

Functions

A function is a piece of code that is created with a name and you can call this function anywhere else by using its name.

```
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2"""
3Created on Thu Dec 28 22:53:20 2017
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5@author: Philippe BOULANGER
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22
23nb = 1000000
24create( nb )
```



Lesson overview	1
Year 9 CPSHE	
The Ullathorne Way and Character Passport	
Local and central government	
Political parties	
Voting and elections	
Parliament and the monarchy	

Keywords	Definitions	2
Political party	A political party is an organisation that coordinates candidates to compete in a country's elections. It is common for the members of a political party to have similar ideas about politics, and parties may promote specific ideological or policy goals.	
Voting system	An electoral system or voting system is a set of rules that determine how elections and referendums are conducted and how their results are determined.	
Democracy	A system of government by the whole population or all the eligible members of a state, typically through elected representatives.	
Monarchy	A form of government with a monarch at the head (in the UK currently the King)	

Rishi Sunak

• The Conservative Party can trace its roots back to the 18th century. As Britain's main centre-right party, it has traditionally stood for free trade, private enterprise, individual liberty, low taxation and strong defence. Rishi Sunak is its newly appointed leader (October 2022).

Sir Ed Davey

• The Liberal Democrats were formed in 1988 by the merger of one of Britain's oldest political institutions, the Liberal Party, which stood for free trade and individual liberty, and the Social Democratic Party, a centrist offshoot of the Labour Party. Sir Ed Davey has been leader since 2019.

Sir Kier Starmer

• Founded by the trade union movement in 1900 to give workers a voice in Parliament, the Labour Party is Britain's main left wing party. It has moved towards the centre ground in recent decades but wealth redistribution and social justice remain key aims. Sir Kier Starmer has been the leader since 2020.



Central government

In the UK, the Prime Minister leads the government with the support of the Cabinet and ministers. The Prime Minister also oversees the operation of the Civil Service and government agencies, appoints members of the government and is the principal government figure in the House of Commons.

The Cabinet is made up of the senior members of government. Every week during Parliament, members of the Cabinet (Secretaries of State from all departments and some other ministers) meet to discuss the

Local government is responsible for a range of vital services for people and businesses in defined areas. Among them are well known functions such as social care, schools, housing and planning and waste collection, but also lesser known ones such as licensing, business support, registrar services and pest control. Local councils, which is the most common type of local authority, are made up of councillors who are elected by the public in local elections. Councillors work with local people and partners, such as local businesses and other organisations, to agree and deliver on local priorities. The decisions are implemented by permanent council staff, council officers, who deliver services on a daily basis.

These are the MPs for Coventry.

Colleen Fletcher
Labour
Coventry North East

Taiwo Owatemi
Labour
Coventry North West

Zarah Sultana
Labour
Coventry South

Year 9 CPSHE Autumn Term 2

Healthy Lifestyles

Lesson overview

Healthy mind

Healthy relationships

Eating disorders

Dealing with loss

Wellbeing review

Keywords

Definitions

Grief

Intense sorrow, especially caused by someone's death.

Anorexia

Lack or loss of appetite for food (as a medical condition).

Bulimia

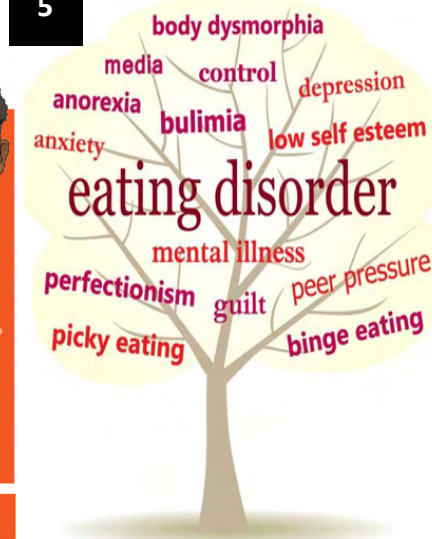
An emotional disorder characterised by a distorted body image and an obsessive desire to lose weight, in which bouts of extreme overeating are followed by fasting or self-induced vomiting or purging.

4

Stages of Loss and Grief: Death



5



6

Healthy

Unhealthy

Abusive

A healthy relationship means both you and your partner are:

- Communicating
- Respectful
- Trusting
- Honest
- Equal
- Enjoying personal time away from each other
- Making mutual choices
- Economic/financial partners

You may be in an unhealthy relationship if your partner is:

- Not communicating
- Disrespectful
- Not trusting
- Dishonest
- Trying to take control
- Only spending time together
- Pressured into activities
- Unequal economically

Abuse is occurring in a relationship when one partner is:

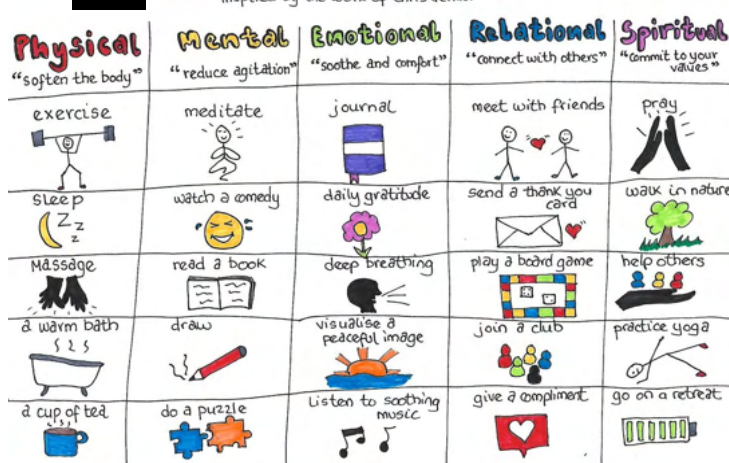
- Communicating in a hurtful or threatening way
- Mistreating
- Accusing the other of cheating when it's untrue
- Denying their actions are abusive
- Controlling
- Isolating their partner from others

3

SELF-COMPASSION IN DAILY LIFE

inspired by the work of Chris Germer

Sketchnote by @Happys



7



YOUNGmINDS
fighting for young people's mental health



8

9

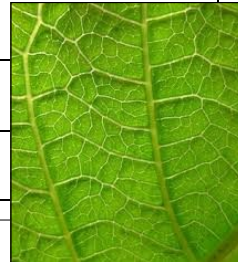


In school remember you can always talk to your form tutor, the chaplain, your PSM and Head of Year.

Year 9 - Art Textiles - Natural Forms

1. Keywords

Aesthetics	The overall look of something, to study its appeal and beauty
Annotation	Notes or explanations added to a piece of work to explain your thinking
Texture	The quality of something that can be decided by touch
Techniques	A practical skill learnt in Art Textiles such as printing, embroidery
Poly printing	A printing techniques where marks are left in Styrofoam and then ink rolled
Natural Form	an objects in nature in its original form. Examples:- Leaves, flowers, pine cones, sea weed, shells, bones, insects, stones, fossils, crystals, feathers,
Image Page	A page covered in images which reflects a theme
Theme	The main focus or subject of the work
Reflective	To think about and analyse your thoughts and ideas



5. Artist—Anya Gallaccio

A British textile artists that creates installation art based on organic and natural matter.



6. Artist—Cas Holmes

A multi media textile artist that works with found materials and stitch



2. Assessment Objective 1—Researching for a project

What you should include in your sketchbook

A Theme Mind Map – Mind map all the things you can think of relating to your topic! Include images if you want to.

Image Page – Collect images linked to your theme into an image page – annotate keywords about the images / theme.

Artist / Designer Analysis – Look at an existing artist or designer and complete an analysis of their work

3. Assessment Objective 3—Annotation of work

What should you include in your sketchbook. You need to annotate your work through out and be reflective.

Describe—What? What is it that you have made?

Explain—How? How did you do it? What techniques did you use? How does it fit the brief?

Reflect—Why? Why did you use those techniques? Why did it work/not work? What might you do differently next time? How will you use this in the future of your pro-

4. Assessment Objective 2 and 4—Techniques

The techniques you will focus on this project are:

Mono Printing

Poly Printing

Ink work



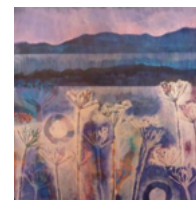
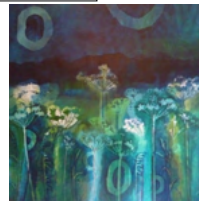
8. Artist—Yellena James

An illustrator that works with under the sea theme and specialises in silk and gutta work



7. Artist—Caroline Dangerfield

A freelance artist that explores landscapes and nature in her local area.



Bacteria are found everywhere and need the right temperature, time, nutrients, pH level and oxygen to multiply.

Microorganisms (bacteria) are used to make a range of food products such as cheese, yoghurt and bread.

Bacterial contamination is the process of harmful bacterial in our food, which can lead to food poisoning and illness.

As a food handler you must do everything possible to prevent contamination and to control conditions that allow bacteria to multiply: cleaning, cooking, chilling, cross contamination.

The main symptoms of food poisoning are nausea, diarrhoea, vomiting, loss of appetite, mild fever.

Bacterial responsible for cause food poisoning are salmonella, E.Coli, listeria and others.

Biological contamination - bacteria which might lead to food poisoning. Symptoms of food poisoning can include diarrhoea, vomiting, headaches and fever.

Physical contamination - foreign materials can cause injury. These could come from metal or plastic from factory machinery, or natural hazards like bones in fish.

Chemical contamination - pesticides or cleaning fluids contaminate food. These could cause severe illness.

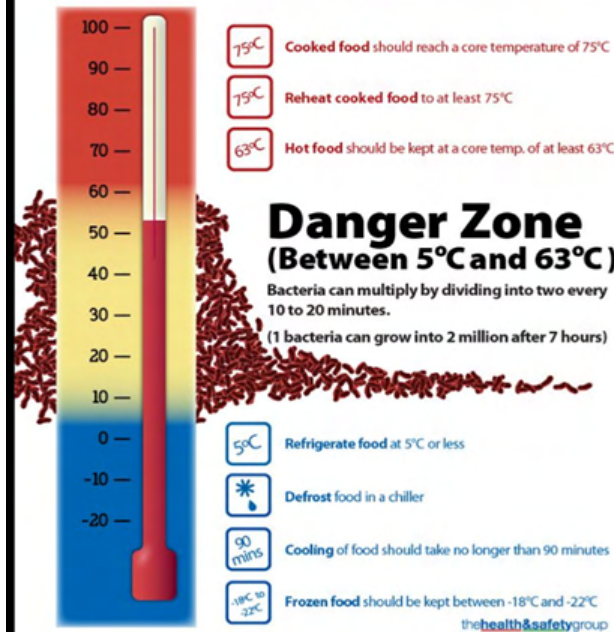
Food poisoning (pathogenic bacteria)

Samonella, E.Coli, Listeria, Bacillus Cereus, Staphylococcus Aureus, Clostridium perfringens, Campylobacter

Microorganisms need five conditions to grow and multiply:



Keep food out of the Danger Zone



Environmental Health Officer (EHO)

The EHO is responsible for carrying out measure to protect public health and to provide support to minimise health and safety hazards.

EHO Responsibilities

Check food producers handle food hygienically. They check food is being stored at the correct temperature.

They review processes in the workplace e.g. use of correct equipment such as coloured chopping boards. They inspect food stores such as the fridge and freezers.

They identify hazards.

They ask questions to check compliance with the law.

Macronutrients

Protein is needed for growth, maintenance and repair.

Proteins are built up of units of amino acids.

Fats can be classified as either saturated or unsaturated.

Saturated fats are considered to be more harmful to health because they raise levels of cholesterol.

Carbohydrates provide the body with energy.

Most of our energy should come from complex starchy foods.

Vitamins and **minerals** are micronutrients, required in small amounts to do essential jobs in the body.

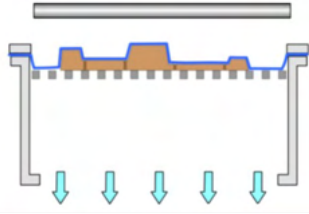
Water makes up 2/3 of the body so it is vital to drink regularly.

Nutritional needs change throughout life, but everyone needs to consider.

Nutrient	Function and food source
Vitamin A	Keeps the eyes and skin healthy. Found in milk, liver, carrots, red peppers.
Vitamin B Group	Releases energy from food. Bread, fish, broccoli, milk, peas, rice.
Vitamin C	Keeps connective tissue healthy. Helps the body absorb iron. Oranges, blackcurrants, red and green peppers.
Vitamin D	Helps the body absorb calcium for strong bones and teeth. Butter, eggs, milk, oily fish.
Calcium	Builds strong bones and teeth. Yoghurt, cheese, milk, tofu.
Iron	Keeps red blood cells healthy. Dark green vegetables, beans fish, egg yolk.
Sodium (salt)	Keeps the correct water balance in the body. Cheese, ready meals, salted nuts, bacon.

Vacuum forming

1



1. place former on the platen and lower it with the lever
2. secure HIPS in place with toggle clamps to create air tight seal
3. heat HIPS until softened
4. raise the platen and turn vacuum on to pull the HIPS around the formers
5. lower the platen and leave to cool before unclamping the HIPS

Formers must have a draft angle so they can be removed from the HIPS. **Webbing** can occur if formers are too close together, too high or the HIPS wasn't heated properly.

Former



The item to be vacuum formed

Platen



Inside the vacuum former to put formers on. It is raised and lowered by the lever.

Thermoforming Polymers

- Can be reheated and reshaped
- Can be recycled

Examples:

Acrylic, PVC, HIPS, HDPE, Styrofoam



CNC Plotter cutter

Stickers can be designed on a CAD system to include colours / images and then cut out **accurately** and **repeatedly** by CAM. Different coloured vinyl can be used. One-offs can be easily cut which allows for **personalised** stickers and designs can easily be **edited**.

Thermosetting Polymers

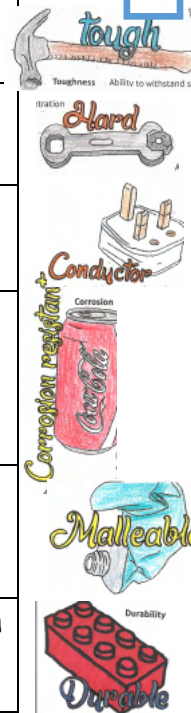
- CAN'T be reheated or reshaped
- CAN'T be recycled

Examples:

Urea formaldehyde, polyester resin

Properties of Materials

Hard	Able to withstand being dented
Tough	Able to withstand breaking on impact
Conductor	Able to conduct electricity and heat
Corrosion resistant	Able to resist corrosion (will not react with oxygen and water)
Malleable	Able to be permanently deformed in all directions without breaking
Durable	Able to withstand deterioration over time



E.g. cast iron

Ferrous Metals

E.g. stainless steel

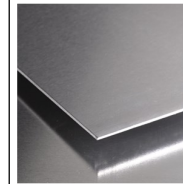


Metals which contain iron and will rust and will attract a magnet

E.g. copper

Non-ferrous Metals

E.g. aluminium



Metals which contain DO NOT iron and will NOT rust and will NOT attract a magnet

E.g. ferrous alloy: stainless steel

Alloys

E.g. non-ferrous alloy: brass, bronze



Metals that are a mixture of two or more other metals or elements

3

E.g. oak, beech

Hard-woods

E.g. ash, mahogany



Timbers from deciduous trees that lose their leaves in winter. They produce expensive, close grained woods.

Soft-woods

E.g. cedar, pine



Timbers from coniferous trees that have needles and cones. They produce cheaper woods with lots of knots.

Manufactured Boards

E.g. plywood, MDF



Boards that we make from scraps of other timbers e.g MDF, chipboard,

4

5

1. Dramatic Conventions / Techniques	
Devising	Creating a performance (usually from a stimulus).
Performance	Present your scenes to an audience.
Flashback	A scene used in film/television/theatre to reference events that have taken place previously at an earlier time in the story.
Hotseating (in role)	Interviewing the character.
Hotseating (out of role)	Interviewing the actor.
Open questions	Questions that require more than a 'yes' or 'no' answer.
Tableau / Freeze Frame	A 'living picture' showing a moment in time – as though the pause button has been pressed.
Narration	Give the audience information, particularly of what they don't see.
Direct Address	A character talks to the audience and any other characters on stage do not appear to hear.
Multi-role	Play more than one character.
Voice-over	Narrating off stage.
Cross-Cutting	Alternating between two different scenes both on stage simultaneously.

Year 9

DRAMA

Autumn

2. Key Words

Technical elements	Signs and symbols in drama - use of Props, Costume, Lights, Sound, Music, Scenery, Set, Hair, Make-up, Backdrop...
---------------------------	--

3. Areas of the Stage

Remember: The stage is always from the **actor's** point of view, as they are the ones standing on the stage. Demonstrate good **spatial awareness** by using all areas of the stage, where appropriate.

4. Command Words	
Identify	Establish or indicate who or what someone or something is.
Describe	Set out characteristics of something
Analyse	Look at the information provided and break it down to identify and interpret the main points being raised.
Explore	Travel through an unfamiliar subject or situation in order to learn about it.
Collaborate	Work with others to reach a conclusion.
Hypothesis	a supposition or proposed explanation made on the basis of limited evidence as a starting point for further investigation.
Justify	be a good reason for.
Explain	Set out purposes or reasons
Communicate	convey or share an emotion or feeling in a verbal or non-verbal way.
Evaluate	Make a judgment from the evidence available
Creating	The process of developing a drama's content and roles through practical exploration, experimentation and problem solving.

Year 9 Autumn

DRAMA

Page 2 of 2



5. Key Words

Performance skills	Signs and Symbols in Drama - an actor will use their Vocal Skills and Physical Skills to communicate to an audience
Characterisation	Using a range of performance skills to create a character that is different to yourself.

6. Vocal Skills (Skills that involve using your voice)

1. Projection	Ensuring your voice is loud and clear for the audience to hear.
2. Volume	How loudly or quietly you say something. (Shouting, whispering)
3. Tone	The way you say something in order to communicate your emotions. (E.g. Angry, worried, joyous tone of voice)
4. Pace	The speed of what you say. (How quickly, how slowly)
5. Pause	The silence between words and/or sentences. Moments of pause can create tension , show that you are thinking or create emphasis .
6. Accent	Use of an accent tells the audience where your character is from .
7. Pitch	How high or low your voice is.
8. Emphasis	Changing the way a word or part of a sentence is said, in order to emphasise it. (Make it stand out.) Try emphasising the words in capital letters and see how it changes the meaning: "How could YOU do that?" "How could you do THAT ?"

7. Physical Skills (Skills that involve using your body)

1. Movement	Does an actor move towards or away from another character?
2. Posture	The position an actor holds their body when sitting or standing. For example, an upright posture or slouched.
3. Gait	The way an actor walks .
4. Facial Expressions	A form of non-verbal communication that expresses the way you are feeling, using the face. E.g. Raised eyebrows or pursed lips .
5. Gestures	A movement of part of the body , especially a hand or the head, to express an idea or meaning. E.g. Waving, pointing, thumbs up .
6. Pace	How quickly or slowly an actor moves.
7. Levels	Sitting, Standing, Lying – what does it show?
8. Touch	Physical contact or lack of it with other characters.

Bishop Ullathorne Catholic School. Year 9- Shades of Humanity and Non-Fiction writing.



1

Knowing your audience and purpose:

When writing non-fiction texts it is essential that you take a moment to establish who you are writing for and why. Once you have a good awareness of your audience and purpose you should plan your writing carefully to ensure it is perfectly suited.

2

Persuasive devices and Language Features:

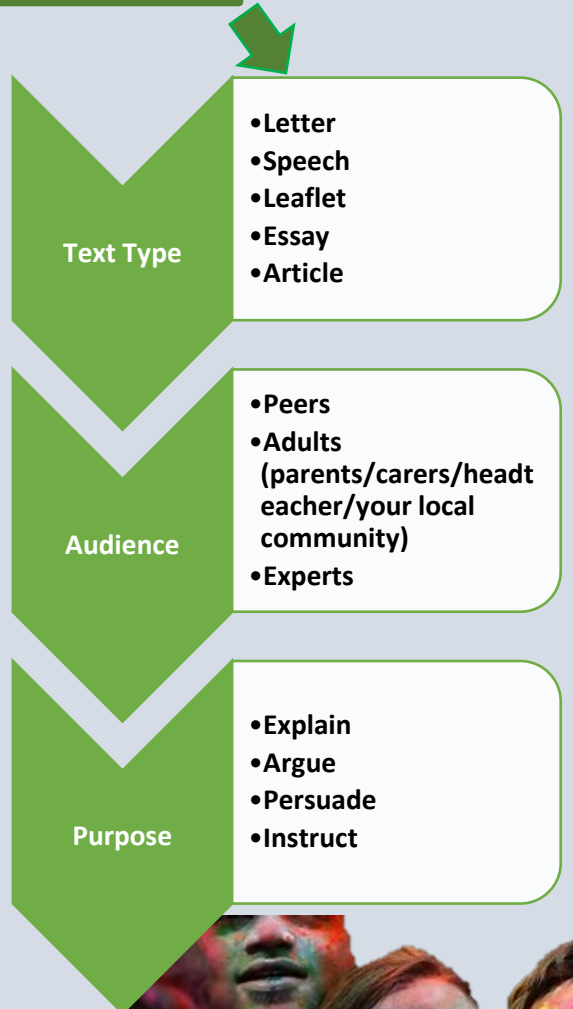
R	•Rhetorical Question
E	•Emotive Language
A	•Anecdote
D	•Dialogue (Direct/Reported Speech)
M	•Metaphor, Simile
Y	•‘You’- Second Person Pronoun
R	•Repetition
U	•‘Us’- Collective Pronouns
L	•List of 3
E	•Exaggeration/Hyperbole
S	•Statistics and Facts
N	•Noun Phrases/Sentence Structures
O	•Onomatopoeia
W	•Words/ Adventurous vocabulary

3

Use Connectives:

Use a range of connective to signpost where you are going next:

- However
- On the other hand
- Furthermore
- Finally
- Consequently
- Moreover
- Nevertheless
- In addition
- As a result
- On the contrary
- By contrast
- Likewise
- Most importantly



FORMAL LETTER

- The use of addresses
- A date
- A formal mode of address e.g. Dear Sir/Madam or a named recipient
- An appropriate mode of signing off

**NEWSPAPER ARTICLE**

- A clear, apt and original title
- A Strapline
- Subheading
- An introductory (overview) paragraph
- Effectively sequenced paragraphs, using connectives

**LEAFLET**

- A clear, apt and original title
- Organisational devices. For example, inventive sub headings or text boxes
- Bullet points
- A range of sections covering different ideas
- Effectively and fluently sequenced paragraphs

**SPEECH**

- A clear address to the audience
- Effectively and fluently links sections to indicate sequence
- Rhetorical indicators to address your audience throughout your speech.
- A clear sign that your speech is complete, e.g. Thank you for listening.

**AN ESSAY**

- A clear introduction to signposts the direction your essay will take by outlining your thesis.
- A range of fluent and coherent ideas (use a range of connectives.)
- A conclusion which supports your argument in a convincing way.



By thinking carefully about how you phrase your ideas, you can ensure that your writing remains varied and interesting.



Bishop Ullathorne Catholic School. Year 9- Of Mice and Men – John Steinbeck

Plot Overview

1

George Milton and **Lennie Small**, two itinerant workers who travel from one ranch job to another.

George is a sharp, wiry man with dreams of saving enough money to buy land for a farm and become the master of his own destiny. **Lennie** is a hulking but simple-minded man who has short-term memory problems and a fascination with stroking soft objects.

The boss of the ranch comes to greet the men and agrees to allow them to stay on, though he's disappointed that they're late for their shift and sceptical of two men who travel together.

Candy fills **George** and **Lennie** in on the dynamics of the ranch, warning them that the boss often takes his anger out on the black stable hand, **Crooks**, while the boss's son **Curley**, a short and pathetic man, is always desperate for a fight in which he can prove his strength.

2

Authorial Intent- Why did Steinbeck Write 'Of Mice and Men'?

In its most simplest for authorial intent is what the author meant when they wrote their novel. Writers will often deliver moral messages, or share their perspective on a given topic. Once we have an understanding of context, the writer's background and the plot, we are better prepared to make a valid judgement on the author's intentions and purposes in writing the book in the way they do.

Although Steinbeck was born into a fairly wealthy family, he chose to write about the lives of poor farm labourers after he spent some time working with them. He often deals with the disempowered and poor who work hard in the hopes of attaining a better quality of life. Most of the main characters in *'Of Mice and Men'* represent some of the minority, marginalised groups at that time (Curley's wife = only female on the farm, Crooks = Negro and disabled, Candy = Old and Lennie = slow-witted, harmless giant.)

When considering Crooks we see how, through him, Steinbeck represents the plight of the disempowered black individuals who were caught in the economic poverty and extreme racism of the 1930's. Steinbeck deliberately establishes Crooks as a fully rounded, intelligent, three-dimensional character, not merely a token victim of racism. Steinbeck's sensitivity in writing Crooks' characters allows us to see a snapshot of times gone by. Steinbeck acknowledges that racism was very much an engrained part of society and he intends to shock us by showing us the brutal reality. And yet, through his sensitive narration, it is evident that he never condones the way Crooks is treated by other characters. Through dialogue, Crooks proudly tells how he is 'a southern negro', also through dialogue we hear other characters use the derogatory term 'nigger' in reference to or about Crooks; However, it is important to note that through deliberate choice and conscious crafting, Steinbeck **always** refers to Crooks as a 'negro stable buck'; always choosing the most respectful noun when talking about Crooks.

3

Cyclical Structure.

"A water snake slipped along the pool, it's hear up like a little periscope."

"A water snake came to the legs of a motionless heron that stood in the shallows. A silent head and beak lanced down and plucked it out by the head, and the beak swallowed the little snake while its tail waved frantically."

Cyclical – novel begins and ends at the same place. Highlighting the end of their American dream.

George and **Slim** play cards in the bunk house while some of the other laborers play a game of horseshoes outside. **Lennie** is in the barn, playing with the new puppy **Slim** has given him.

Candy brings his dog inside, and **Carlson** comments on the dog's disgusting odour. He suggests Candy put the dog, who is blind, lame, and mangy, out of its misery. Carlson offers to shoot the dog with his pistol, and **Slim** promises Candy a new puppy from the litter

Lennie asks **George** to tell him about their farm, and **George** gets lost in his own reverie as he talks aloud about their little plot of land. Candy interjects to tell them that he can help make their dream a reality if they'll let him join them on the farm—he'll pitch in the money he has saved up from the accident that cost him his hand.

Crooks claims that he doesn't want Lennie's company—just as he isn't allowed to go around with the white ranch hands, he doesn't want any of them coming into his space. But when he sees how innocent and well-meaning Lennie is, he agrees to let the man in. As Crooks tells **Lennie** about his painful past marked by racism, discrimination, and loneliness.

Curley's wife comes into the barn and approaches Lennie. When she sees that the puppy is dead, she tries to soothe **Lennie** by assuring him he'll be able to get another one. She laments her unending loneliness, and states that she should have had a different life—she says she should have been a movie star

Lennie sits by the pool off the Salinas, worried about getting in trouble with **George** and tortured by visions of his **Aunt Clara**, who turns into a giant rabbit and harasses Lennie for his stupidity and cruelty. George comes crashing through the brush and embraces Lennie. Lennie apologizes for what he's done, but George insists that it doesn't matter and says he isn't mad at Lennie at all

His Art of Writing...



4

Themes

Disappointed
DreamsLoneliness and
Isolation

Friendship

Death and
InevitabilityThe Plight of
minority
groups

Injustice



5

Animal Imagery



'He walked heavily, dragging his feet a little, the way a bear **drags his paws.**' Lennie **dabbled his paw** in the water.' ... '[Curley's] first lost in Lennie's **paw.**' 'He **pawed up** the hay until it partly covered her.'



'His huge companion dropped his blankets and flung himself down and drank from the surface of the green pool; drank with long gulps, **snorting into the water like a horse.**'



'**Strong as a bull.**'



"Slowly, **like a terrier** who doesn't want to bring a ball to its master, Lennie approached, drew back, approached again."



"Lennie covered his face with **huge paws and bleated** with terror."

6

Significant context



The Great Depression began with the stock market crash of 1929. On October 29 1929, millions of dollars were wiped out of the stock market in the **Wall Street Crash**.

No Welfare State
Times were desperately hard for some sections of society. With no welfare state to support them, many ended up living in shanty towns called 'Hoovervilles'.

The Dust Bowl was the name given to the drought-stricken Southern Plains region of the United States, which suffered severe dust storms during a dry period in the 1930s. People and livestock were killed..

Significant
context

Gender –
During the 1930's women were seen as the property of their husbands and they had to take care of them and do their bidding.

California Civil Code 1905 – laws that outlined the rights and obligations for all people in California. Laws that enforced racial segregation in the Southern United States.

The American Dream – the ideal by which equality of opportunity is available to any American, allowing the highest aspirations and goals to be achieved.



YEAR 9 GEOGRAPHY - DEVELOPMENT

1. KEY VOCABULARY

Life Expectancy	The average age to which a person lives
Infant mortality rate	Counts the number of babies, per 1000 live births, who die under the age of one.
Poverty	Indices count the percentage of people living below the poverty level, or on very small incomes (e.g. under £1 per day).
Access to basic services	The availability of services necessary for a healthy life, such as clean water and sanitation
Access to healthcare	Takes into account statistics such as how many doctors there are for every patient
Development	Is a process of change that affects people's lives. It may involve an improvement in the quality of life as perceived by the people undergoing change.
Literacy rate	The percentage of adults who can read and write.
GDP per Capita	(Gross Domestic Product per Capita). This is a measure of the total output of a country that takes gross domestic product (GDP) and divides it by the number of people in the country.
Birth Rate	The number of live births per thousand of population per year

2. HDI

Human Development Index (HDI)- a way to measure wellbeing within a country. This is mainly a social measurement because it takes into consideration education, which is adult literacy rate and years of schooling, health care which is judged by life expectancy and finally the economic factor of GDP.

3. FACTORS INFLUENCING DEVELOPMENT

Environmental - Natural hazards, extreme weathers can damage regions and areas, this costs money to rebuild.

- Extreme climates, droughts or flooding of land, can harm crops so people don't have food.
- Landlocked countries find it harder to trade, they cannot travel by sea to other countries.

Economic - Corrupt governments can influence where money is spent, often on war and government members.

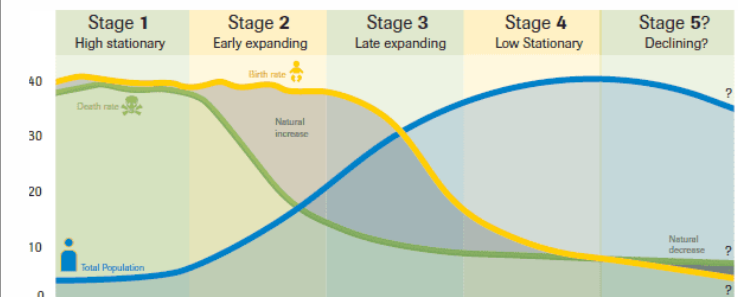
- If countries are in debt they owe any profit they make and can not use it for development.
- Trade- HICs buy cheap goods and LICs buy expensive goods and sell cheap goods.

Historical - Borders of some colonial countries were set without attention to tribal and cultural differences, causing tensions and instability.

- Colonial powers took advantage of native people and the natural resources, leaving countries less able to develop.
- When European powers were forced out, they left little industry, low levels of education and social unrest.

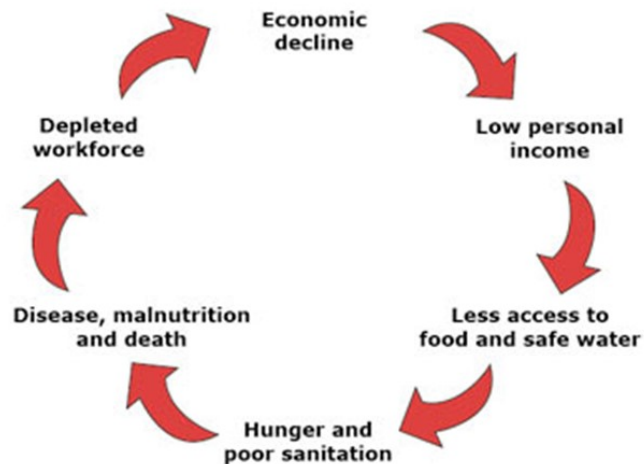
Stages of the DTM **Stage 1**: High birth rate, high death rate. Low population and low population growth due to dirty water, lack of healthcare, famine, and disease. **Stage 2**: Birth rate stays high, however death rate drops due to more money being spent on healthcare and clean water. Population increases. **Stage 3**: Birth rate starts to drop as people start having less children. Birth control education improves and most children survive to adulthood meaning that as most children survive to adulthood. Birth rate drops – population increase slows down. **Stage 4**: The country is now wealthy. Family planning is widespread. Low birth rate and death rate. Small population growth. **Stage 5**: People have very few children. The death rate is higher than the birth rate. The population starts to drop

4. DEMOGRAPHIC TRANSITION MODEL



YEAR 9 GEOGRAPHY - DEVELOPMENT

5. DEBT AND POVERTY



A) Armed conflict forces people to leave their homes, land and jobs. Healthcare and schools are also disrupted.	Conflict
B) Poor countries borrow money to fund development projects like roads, irrigation programmes and agriculture. Poor harvests, natural disasters or low export prices mean debts build up.	Debt
C) There is no supply of the right food and people's health suffers as a result. This means people are too weak to earn money and cannot afford to send their children to school.	Food
D) Children have fewer opportunities to go to school as their parents cannot afford to send them and they have to work instead.	Education
E) Women have less access to education than men. They also earn lower wages.	Gender
F) People are unable to afford healthcare and if they can it is not of the right kind. In Africa many people die of AIDS as a result of this.	Health
G) Climate change means that countries struggle to grow crops to export. In some countries flooding means that people lose their farmland and livelihood.	Environment
H) Trade rules favour richer countries. Countries dependent on the export of products such as tea, coffee, food crops and raw materials are at the mercy of international markets as prices change a lot.	Trade

6. AID

- Short term aid – helps solve immediate problems. It brings help quickly to people affected by disasters such as floods.
- Long term aid – this is aid which helps improve basic living standards and enable people to make better use of their own resources for the long term.

Types of aid - Skilled people, Equipment, Food supplies, Money (Financial Aid), Emergency assistance and Charity Projects.

7. FAIR TRADE

Trade between companies in developed countries and producers in developing countries in which fair prices are paid to the producers.

How can this be useful to help countries to develop?

- Fair trade allows producers to be paid a fair price for their goods rather than being exploited. This is useful as it means they will earn more money for their products which then means they will be able to afford a better lifestyle. If this happens across a country, over time it may have a better chance of developing and making people's lives better.

8. TRADE TRAP

Balance of Trade – The difference between a country's imports and exports

Exports – Goods sold to other countries

Imports – Goods that are bought by a country

Manufactured goods – High value products such as machinery and cars.

Primary goods – Low value products such as food and minerals

Trade – exchange of goods and materials

A Trade trap is where countries that rely on the sale of primary products (raw materials and foodstuffs) find that they are nearly always often worse off than the countries that rely on manufactured goods for their income. HIC's know LIC's are vulnerable therefore pay the lowest they can possibly go for the raw materials and then sell on their manufactured goods to wealthier countries for a high amount of money. This often leaves the primary producer struggling for money and being exploited by HIC's.

YEAR 9 GEOGRAPHY – SUSTAINABLE LIVING

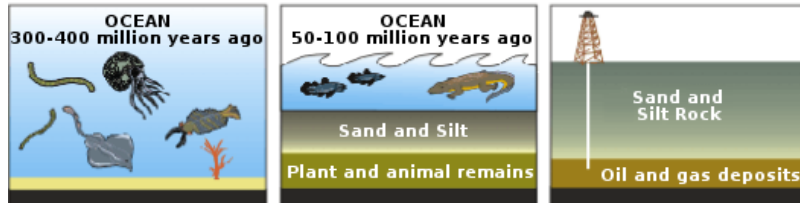
1 KEY VOCABULARY		2 THE NATIONAL GRID	
	Sustainability	A way of living that ensures we gain what we need now without destroying the environment for future generations.	
	Energy	A form of power	
	Consumption	The amount of energy that we use in our day to day lives.	
	National Grid	A system of electric cabling that supplies electricity all round the UK.	
	Thermal Power Station	A form of making electricity through burning a fuel to heat water to steam to drive a turbine to turn a generator.	
	Fossil Fuels	A Carbon based fuel formed from the dead remains of plants and animals millions of years ago	
	Renewable energy	Energy that can be re-used, at lasts indefinitely.	
	Nuclear energy	A chemical reaction to provide heat for a thermal power station with no burning of fossil fuels.	
	Carbon Footprint	A measure of all the greenhouse gases that we produce in our day to day lives.	
	Eco-house	A house that is designed to have a low impact on the environment, especially with Carbon emissions.	
3 ELECTRICITY USE		4 MAKING ELECTRICITY	
		A System built in 1930's to enable electricity to be transported via a series of cables and pylons to every house in the UK. It means that regional generators can supply electricity to anywhere in the UK. Suppliers have to create the electricity when it is needed as electricity cannot be stored on the grid.	
		- Electricity use is higher in Winter - Peak Use is during the evening. - Use is lower at night. - Off Peak use at night increases as some people take advantage of cheaper 'off peak' electricity. - The National grid must predict use of electricity. - Graphs like this help them to predict the use. - The weather will make a difference to use. - Major events like football matches will affect use.	
		Typical winter weekday demands on the National Grid	
		- Fuel is burned. - Water is heated to steam in a boiler. - The steam is under pressure. - The Stream drives a turbine. - The turbine spins a generator - This generator makes electricity. - Waste and Carbon Dioxide are outputs from the system. - The cooled water is reused or released into rivers.	
5 PROBLEMS WITH THERMAL POWER STATIONS		Noisy, Fossil fuels release Carbon Dioxide (a greenhouse gas), warm water released can cause Eutrophication, they encourage humans to dig for more fossil fuels, waste ash covers the ground and stops ecosystem growth. Transporting fossil fuels can lead to environmental disasters like oil spills.	

YEAR 9 GEOGRAPHY– SUSTAINABLE LIVING

6

HOW FOSSIL FUELS ARE MADE.

Petroleum and natural gas formation

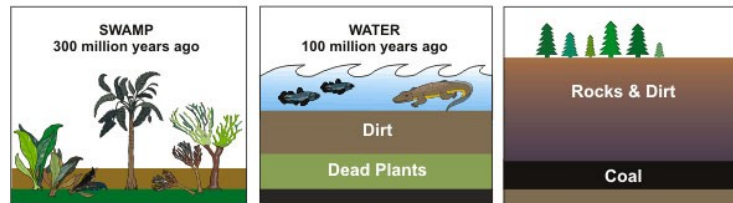


Tiny sea plants and animals died and were buried on the ocean floor. Over time they were covered by layers of silt and sand.

Over millions of years, the remains were buried deeper and deeper. The enormous heat and pressure turned them into oil and gas.

Today we drill down through layers of sand, silt and rock to reach the rock formations that contain oil and gas deposits.

HOW COAL WAS FORMED



Before the dinosaurs, many giant plants died in swamps.

Over millions of years, the plants were buried under water and dirt.

Heat and pressure turned the dead plants into coal.

7

RENEWABLE ENERGY

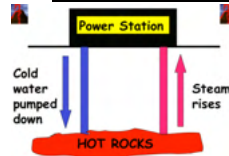
Solar



Hydroelectric Power



Geothermal



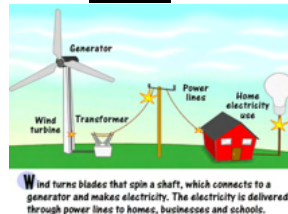
Tidal



Biomass



Wind



8

NUCLEAR ENERGY

Nuclear energy originates from the splitting of uranium atoms in a process called fission. At the power plant, the fission process is used to generate heat for producing steam, which is used by a turbine to generate electricity.



Advantages

Little pollution

Technology is available does not need to be developed

Costs about the same as coal so electricity is not expensive

Safe ??? Chances of an accident are low.

Disadvantages

Reactor meltdown – can cause environmental damage and loss of life

Radiation – cancer, sickness and mutation

Uranium is a scarce resource – may only last for 30-60 yrs depending on demand

A lot of money has to be spent on safety

9

REDUCING CARBON FOOTPRINT

	Install wall insulation	
	Electricity powered by renewable energy	
	Use public transport	
	Buy locally produced vegetables	
	Provide cycle lanes	
	Support farmers to grow organic produce	
	Higher taxes on goods and activities that produce higher levels of carbon emissions	
	Work with the European Union, G8 and UN to find ways to reach an agreement on action to reduce climate change	
	Pledge to cut carbon emissions	
	Invest in public transport	
	Electricity powered by renewable energy	
	Build energy efficient homes	
	Wash clothes at a lower temperature	
	Ban light bulbs that are not energy efficient	

YEAR 9 AUTUMN TERM 1: EVENTS OF THE 20TH CENTURY / VOTES FOR WOMEN

SECTION 1 – KEYWORDS

Significant	Something that is important or worthy of attention
Suffrage	The right to vote in political elections
Suffragists (NUWSS)	Group formed by Millicent Fawcett that campaigned for women to get the vote using peaceful methods
Suffragettes (WSPU)	A member of the women's organisation who campaigned for 'Votes for Women' using militant methods
Emily Davison	Famous Suffragette who killed herself by running out in front of the King's horse at the Derby in June 1913
Mud March	A 3000 strong Suffragist procession in London in February 1907
Militant	Use of confrontational or violent methods in support of a political or social cause
Cat and Mouse Act	Introduced by the government in 1913 in response to hunger strikes. Women were released when ill then rearrested
Munitions	Military weapons, ammunition and equipment. Women were involved in producing this during WW1
Representation of the People Act	Law passed in 1918 giving women over the age of 30 the vote

SECTION 2 – SIGNIFICANT EVENTS OF THE 20TH CENTURY

Make sure that you know when these events happened and something about each one

- **1912** - Captain Scott became the first Briton to reach the South Pole
- **1914** - World War 1 begins
- **1918** - Women get the vote in Britain
- **1928** - Alexander Fleming helped discover the first antibiotic (penicillin)
- **1936** - Black athlete Jesse Owens won a record four gold medals at the Berlin Olympics
- **1939** - World War 2 begins
- **1945** - Adolf Hitler, leader of Nazi Germany, killed himself in a bunker in Berlin
- **1947** - India became independent from Britain
- **1969** - Human beings landed on the moon for the first time

SECTION 3 - Explaining why an event is significant

A significant event is an event that is considered to be important. It is likely to be an event that affected a lot of people deeply at the time and also had a longer term impact. It may well have resulted in change or caused other important events.

EXAMPLE

Fleming's discovery of penicillin is an extremely significant event in the history of medicine. Before his discovery many people died of simple, untreatable infections. Penicillin known at the time as 'the wonder drug' saved the lives of thousands of men in WW2 who were treated with the drug. It is the first antibiotic to be created and used effectively. In the longer term it paved the way for the development of many other antibiotic drugs which have saved millions of lives and continue to be used today.

Tips for answering a 'significance' question

- Write a PEEL paragraph to explain why the event, factor or person was significant **at the time**
- Write a second paragraph to explain why the event, factor or person was significant **in the long term**
- Always aim to use cause and effect connectives to explain impact e.g. 'as a result . . .', 'consequently . . .', 'this led to . . .'

SECTION 4 – THE CAMPAIGN FOR VOTES

Use the information and revision exercises on **BBC Bitesize** and your **key events timeline** to find out about and summarise the following

<https://www.bbc.co.uk/bitesize/guides/zy2ycdm/revision/1>

- Campaign methods used
- Reactions to the campaigns.
- Women and WW1
- Consequences of women getting the vote

SECTION 5 – Answering a 'UTILITY' question

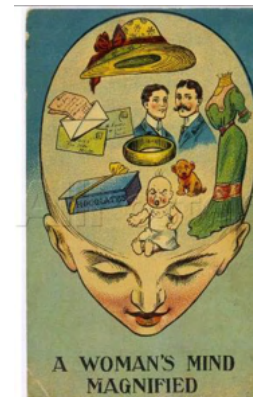
Paragraph 1 Describe one key thing in the source

Use your knowledge to say how this is useful.

Paragraph 2 Describe another key thing in the source.

Use your knowledge to say how this is also useful.

Paragraph 3 – Explain how reliable the source is – who made it and why? Did they have any reasons to exaggerate or not tell the whole story? Is it trustworthy and does that make it more or less useful overall?



Source A. A poster from 1910

TRY THIS How useful is this source as evidence about opposition to votes for women? (8marks)

The source is useful because it shows suggesting that from my knowledge I know

SECTION 6 - TIMELINE: the main events 1016-1914

Date	Main Events
1906	The Liberal Party come to power. Ministers are divided on votes for women
Oct 1906	NUWSS campaign using petitions and meetings. WSPU protest by entering the House of Commons leading to their arrest and imprisonment.
Feb 1907	The NUWSS organise procession in London. Over 3000 women march in what is famously known as the 'Mud March' because of the bad weather.
June 1908	Both the suffragists and suffragettes organise massive processions in London. The PM does nothing in response to these and so the suffragettes start smashing windows in Downing Street and chaining themselves to railings. Both groups are growing in membership.
Late 1908	Split / fallout between suffragists and suffragettes. The NUWSS are worried that the militant tactics used by the WSPU are making the government hostile to votes for women and less likely to grant women the vote.
1909	More WSPU members sent to prison. They demand to be treated as political prisoners and go on hunger strike. The government does not want dead women on its hands and starts force-feeding them
1910	WSPU calls off their violent protests when the PM agrees to work with them to produce a Conciliation Bill giving women the vote. Despite a positive start the government stalls leading to further protests by the WSPU. This turns into 'Black Friday', a fight with the police resulting in many women being physically assaulted by officers.
1911	The WSPU call a truce in the hope that the Conciliation Bill will be passed. The government then announces that it is dropping the Bill and instead produces a Bill giving more votes to men. The WSPU is furious and restarts its campaign of violence.
1912	WSPU begin massive campaign of window smashing leading to many arrests. There are mass hunger strikes in prison resulting in force-feeding
1913	Violence increases, e.g., buildings are bombed, letter boxes destroyed, turf at race courses burned. The Government introduces the 'Cat and Mouse Act' – releasing women on hunger strike when they became ill and then re-arresting them once recovered
June 1913	Emily Davison kills herself by running in front of the King's horse at the Derby. Meanwhile the suffragists carry out the Women's Pilgrimage to win over public support for votes for women.
1914	WSPU violence reaches a height. Public opinion is now firmly against them. Women are banned from art galleries and museums.
July 1914	The First World War begins and both the suffragettes and the suffragists stop their activities in order to help the war effort
1918	The First World War ended. The Government pass The Representation of the People Act granting the vote to women over the age of 30 who met a property qualification.
1928	The Equal Franchise Act was passed allowing men and women to vote on equal terms. All men and women were given the vote at 21 years of age.

SECTION 7 – THINKING ABOUT THE SIGNIFICANCE OF THE CAMPAIGN

Identify and explain the following

- Evidence that people **at the time** thought votes for women was important
- Evidence that the issue affected **a lot of people**
- Evidence that the issue **affected people deeply**
- Evidence that it affected people **for a long time**
- Evidence that the campaigns **brought about change**
- Evidence that it **affects beliefs and attitudes today**



Suffragettes chaining themselves to railings near the Houses of Parliament



Emily Davison throwing herself in front of the King's horse at the Derby 1913



Doctors force feeding a suffragette who is on hunger strike in prison



A photograph of women working in a munitions factory

YEAR 9: THE CAUSES OF THE FIRST WORLD WAR

SECTION 1 –KEYWORDS

Alliance	An agreement between countries to support each other
Allies	Countries on the same side
Anglo-German naval race	Competition between Britain and France over who had the biggest and best navy
Archduke Franz Ferdinand	The heir to the throne of Austria-Hungary who was killed on 28 th June 1914
Assassination	The planned murder of an important person
Austro-Hungarian Empire	Large country in central Europe made up of many different nationalities
Balkans	An unstable area in south-eastern Europe that was the cause of tension
Black Hand	Name of the gang of assassins who killed Franz Ferdinand. A Serb nationalist organisation
Bosnia	A country that became part of Austro-Hungarian empire in 1908. Many Bosnians did not want to be part of the empire
Dreadnought	A new and improved type of warship
Empire	A group of nations or people ruled over by an emperor, or other powerful government
Ethnic Group	People who share same culture, race or nationality
Front	An area where fighting takes place
Gavrillo Princip	Man responsible for the assassination of Franz Ferdinand
Independence	Term referring to countries ruling themselves and not being part of an empire
Kaiser Wilhelm II	Ruler of Germany
Militaristic	Having an aggressive foreign policy involving build up of weapons and armed forces
Mobilise	Preparing and organising troops for war
Morocco	North African country that was the cause of a pre-war crisis between the alliances
Nationalist	A person who strongly identifies with their nation and desires independence
Sarajevo	Capital city of Bosnia where assassination took place
Serbia	An independent country. Many Serbians wanted Bosnia to unite with their country
Schlieffen Plan	German war plan which involves the invasion of France through neutral Belgium
Slav	An ethnic group of eastern and central Europe
Triple Alliance	Agreement between Germany, Austria-Hungary and Italy
Triple Entente	Agreement between Britain, France and Russia

SECTION 2 - THE LONG TERM CAUSES OF TENSION IN EUROPE

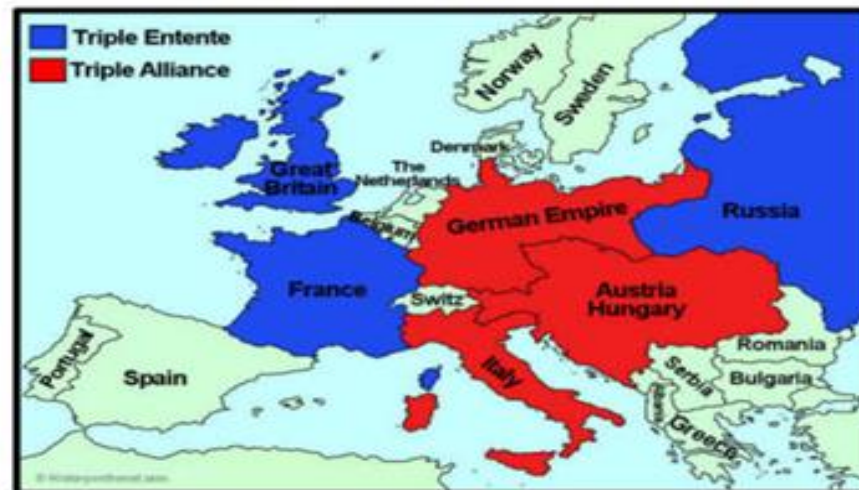
MILITARISM Countries in Europe were involved in an arms race and were building up their armed forces in a bid to become bigger and stronger than the other. Huge amounts of money was being spent on this. An example of this is the Anglo-German naval race between Britain and Germany and the fact that every major European power, except Britain introduced conscription forcing men to join the army.

ALLIANCES By 1900 two armed alliances existed with Russia, Britain and France coming together in the Triple Entente and Germany, Austria Hungary and Italy in the Triple Alliance. Each alliance promised to support and protect their member countries in case of an attack. This meant that a conflict between two rival nations could result in all of the major European countries becoming involved in war.

IMPERIALISM In the early 20th century the major countries of Europe were very imperialistic and sought to expand their influence and empires. Germany tried to gain more colonies which frightened France, Britain and Russia. The crisis over Morocco is a good example of this. In the area of the Balkans Russia was keen to extend her influence competing with Austria for power.

NATIONALISM Countries and groups of people in Europe were proud of their identities and in the Balkan's, growing hatred of Austro-Hungarian control was the cause of increasing problems. It was this situation that resulted in Serbian nationalist, Gavrilo Princip, killing the heir to the Austro-Hungarian in on 28th June 1914.

World War One Alliances 1914



USEFUL LINKS

Approach to War Clip

<https://www.youtube.com/watch?app=desktop&v=H8bdLamOuDc&list=PL54cFFXWPkoGRfQSZXi11wzhYpqK0MOJaf>

BBC Bitesize facts and test

<https://www.bbc.co.uk/bitesize/guides/z4n4jxs/revision/1>

SECTION 3 – TIMELINE

1870	French beaten by German forces in the Franco-Prussian war. Germany took to areas of land from France called Alsace and Lorraine
1888	Kaiser Wilhelm II becomes ruler of Germany. He is determined for Germany to build an empire and increase the size of the German navy
1904	Britain and France sign the 'Entente Cordiale'
1905-6	First Moroccan Crisis – Germany challenges French ambitions over Morocco increasing tensions
1906	Britain announced the creation of a new, improved type of warship called the Dreadnought. The Anglo-German naval race is underway
1907	Britain, France and Russia become allies in the Triple Entente
1908-9	The Balkan Crisis – Bosnia becomes part of the Austro-Hungarian empire. Nearby Serbia is angered by this and calls on Russia for support
1911	Second Moroccan Crisis – Morocco falls under French control
1912-1913	The Balkan Wars – Many Serbs living in Bosnia were determined to break free of Austro-Hungarian rule and join Serbia
28 June 1914	Assassination of Archduke Franz Ferdinand by members of the Black hand
28 July 1914	Austria-Hungary blames Serbia for killing the Archduke. It attacks Belgrade (capital of Serbia)
29 July 1914	Russia, who has promised to protect Serbia, gets its army ready to attack Austria-Hungary
1 August 1914	Germany, in support of Austria- Hungary, declares war on Russia. The French (ally of Russia) prepares its army for war
2 August	Germany begins the first part of the Schlieffen Plan and sends troops towards the Belgian border. Belgium refuses to allow Germany passage through to France
3 August	Germany declares war on France and invades neutral Belgium. This brings Britain into the conflict as it signed at Treaty in 1839 promising to protect Belgium if it was invaded.
4 August	German troops continue their invasion of Belgium. At 11pm Britain declares war on Germany
5 August	France declares war on Germany
6 August	Austria- Hungary declares war on Russia
THE FIRST WORLD WAR IS UNDERWAY	

SECTION 4: ANGLO – GERMAN RIVALRY

- Kaiser Wilhelm had a policy of Weltpolitik – an aggressive policy to gain more overseas colonies and increase the size of the navy. This was a direct challenge to Britain's imperial and naval supremacy.
- Anglo-German naval race – In 1906 Britain launched HMS Dreadnought (first new class of warship) Germany responded by building her own. Both countries spent millions building up size and power of their navy
- All countries in Europe were building up the size of their armies. It was argued that this was for defence, in case of an attack from opposing alliance. Viewed another way, there is the sense that countries were preparing for war and that because of this conflict was inevitable.

SECTION 5: FRENCH – GERMAN RIVALRY

- In 1870 France had been at war with Germany and had lost Alsace and Lorraine. These two area were important economic areas rich in coal, steel and glass production. **The French people wanted revenge against Germany for this loss.**
- France and Germany shared a border and this made the French feel vulnerable about a future German attack therefore increasing the size of the French army and navy
- France and Germany came into conflict over their ambitions in Morocco in both 1905 and 1911. In 1905 the Kaiser gave a speech in support of Moroccan independence which was seen as a direct challenge to French ambitions. Although war was avoided the Moroccan crisis added to tension and rivalry between the two alliances.

SECTION 6 – THE ASSASSINATION: THE SPARK THAT STARTED THE WAR

Causes: Slav nationalism – Bosnia resented being taken over by Austria-Hungary and wanted independence from an empire that treated the Slavic people as inferior. There was a desire within Bosnia and Serbia to unite to the two countries into Greater Serbia.

Events: 28th June 1914 in Sarajevo, Bosnia, Archduke Franz Ferdinand (heir to the Austro-Hungarian throne) was assassinated by Gavrillo Princip a member of the Black Hand a Serb nationalist group.

Consequences: Austria-Hungary blamed the Serbian government for the attack and believed Serbia must be dealt with. On 23rd July A-H issues Serbia with a 10 Point Ultimatum. As one point could not be agreed Austria-Hungary declared war on Serbia on 28th July bombing Belgrade.

Section 7: The Schlieffen Plan

- This was a German Plan to avoid war on two fronts in the east and west
- Plan was to attack France first and to defeat within 6 weeks
- To achieve this the plan involved attacking France by going through neutral Belgium
- It was believed that Russia would take a long time to mobilise troops giving Germany plenty of time to attack France and move troops to the Russian border in the east
- This plan is the reason why Britain enters the war and declares war on Germany.



1. Keywords

Probability

The chance of something happening, given as a fraction, decimal or percentage.

Random

Chosen purely by chance, with no predictability.

Certain

Will definitely happen, this has a probability of 1.

Impossible

Will definitely not happen, this has a probability of 0.

Likely

Will probably happen, but might not.

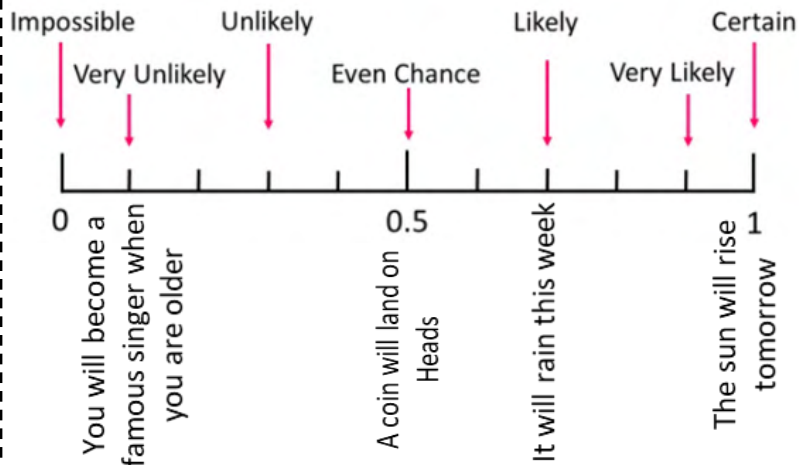
Unlikely

Probably will not happen, but just might.

Evens

Just as likely to happen as not to happen, this has a probability of 0.5.

2. The probability scale



Maths, Y9 - Probability

4. Listing Outcomes

I have 2 coins, if I flip them I could get two heads, two tails or one of each:

HH, TT, HT, TH

The probability of getting tow heads is 1 out of 4, or 0.25

A spinner displays two animals at random from this selection:



What is the probability of getting a matching pair?

How many ways can the spinner stop?

Use a two way table. Pairs of letters show the ways in which the reels can stop.

		left		
		frog	cat	dog
right	frog	FF	CF	DF
	cat	FC	CC	DC
	dog	FD	CD	DD

Using F for frog etc. you can see the pairings that are possible.

These are all of the **possible outcomes**.

5. Probability of combined events

I roll two dice and add the scores together, here are all the possible outcomes:

There are three ways to get a 4: pink 1 blue 3, blue 1 pink 3, pink 2 blue 2. There are 36 different outcomes.

$$P(4) = \frac{3}{36}$$

The probability of scoring a 12 is $\frac{1}{36}$

The most likely score is a 7.

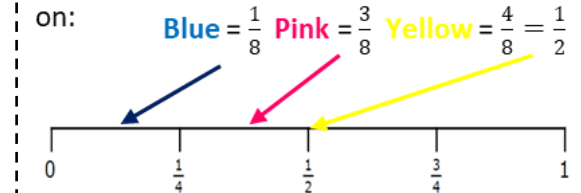
	pink dice					
	1	2	3	4	5	6
blue dice	1	2	3	4	5	6
	2	3	4	5	6	7
	3	4	5	6	7	8
	4	5	6	7	8	9
	5	6	7	8	9	10
	6	7	8	9	10	11

3. Probability of single events

There is an equal chance that the spinner will stop at each section.



Probabilities of stopping on:



6. Relative frequency

This is how we work out how **likely** events are to happen.

How likely is it for a dice to land on a 6?

I threw a dice 100 times and rolled 17 sixes.

The relative frequency of rolling a 6 on this dice was 17 out of 100, or 0.17, which is close to what I would expect.

7. Expected frequency

The table shows the probability of picking a red, green or blue pen from a pencil case.

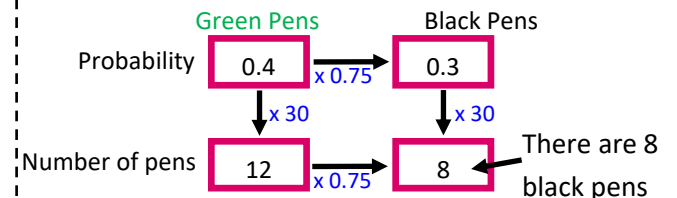
Colour	Red	Green	Blue	Black
Probability	0.1	0.4	0.2	

Find the probability of picking a black pen.

Probabilities add to 1 $0.1 + 0.4 + 0.2 = 0.7$

$$1 - 0.7 = 0.3$$

If there are 12 green pens, how many black pens are there?



1. Solving equations with unknowns on one side

This is where you work backwards to find the unknown number

$$\begin{array}{rcl} 2x + 8 & = & 18 \\ (-8) & & (-8) \\ \hline 2x & = & 10 \\ (\div 2) & & (\div 2) \\ \hline x & = & 5 \end{array}$$

$$\begin{array}{rcl} 3(x + 4) & = & 33 \\ (\div 3) & & (\div 3) \\ \hline x + 4 & = & 11 \\ (-4) & & (-4) \\ \hline x & = & 7 \end{array}$$

$$\begin{array}{rcl} \frac{x - 8}{2} & = & 6 \\ (\times 2) & & (\times 2) \\ \hline x - 8 & = & 12 \\ (+8) & & (+8) \\ \hline x & = & 20 \end{array}$$

2. Solving equations with unknowns on both sides

Start by eliminating the unknowns from one side of the equation

$$\begin{array}{rcl} 6x + 7 & = & 4x + 19 \\ (-4x) & & (-4x) \\ \hline 2x + 7 & = & 19 \\ (-7) & & (-7) \\ \hline 2x & = & 12 \\ (\div 2) & & (\div 2) \\ \hline x & = & 6 \end{array}$$

$$\begin{array}{rcl} 3x + 3 & = & 7x - 5 \\ (-3x) & & (-3x) \\ \hline 3 & = & 4x - 5 \\ (+5) & & (+5) \\ \hline 8 & = & 4x \\ (\div 4) & & (\div 4) \\ \hline 2 & = & x \end{array}$$

$$\begin{array}{rcl} 5x + 3 & = & -6x + 19 \\ (+6x) & & (+6x) \\ \hline 11x + 3 & = & 19 \\ (-3) & & (-3) \\ \hline 11x & = & 16 \\ (\div 11) & & (\div 11) \\ \hline x & = & 1.45 \text{ (to 2 dp)} \end{array}$$

6. Factorising quadratics

This is the opposite to expanding double brackets.

You can draw out the grid and work backwards to find out what the two brackets were.

Factorise $x^2 + 7x + 12$

×	x	
x	x^2	
		12

I need two numbers that **MULTIPLY** to give 12 and **ADD** to give 7.

- + 1 and + 12 ✗
- + 2 and + 6 ✗
- + 3 and + 4 ✓

×	x	4
x	x^2	$4x$
3	$3x$	12

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

7. Simultaneous equations

$$\begin{array}{rcl} 2a + 3b & = & 130 \quad \textcircled{1} \\ 3a + 2b & = & 170 \quad \textcircled{2} \\ \textcircled{1} \times 3 & & 6a + 9b = 390 \quad \textcircled{3} \\ \textcircled{2} \times 2 & & 6a + 4b = 340 \quad \textcircled{4} \\ \hline \text{find the difference: } \textcircled{3} - \textcircled{4} & & 5b = 50 \\ & & b = 10 \\ \hline \text{substitute } b \text{ into } \textcircled{1}: & & 2a + 30 = 130 \\ & & 2a = 100 \\ & & a = 50 \end{array}$$

$$\begin{array}{rcl} 2x - 3y & = & 0 \quad \textcircled{1} \\ 3x + y & = & -11 \quad \textcircled{2} \\ \textcircled{2} \times 3 & & 9x + 3y = -33 \quad \textcircled{3} \\ \textcircled{3} + \textcircled{1} & & 11x = -33 \\ & & x = -3 \\ \hline 3 \times -3 + y & = & -11 \\ -9 + y & = & -11 \\ y & = & -11 + 9 \\ & & y = -2 \end{array}$$

3. Inequalities

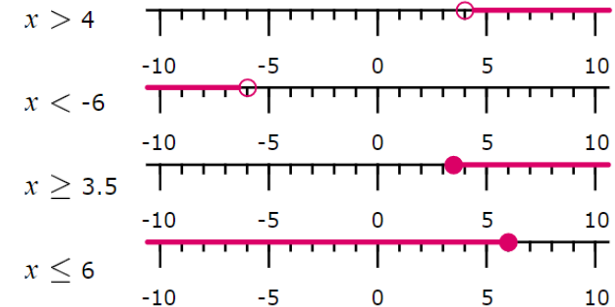
The word **inequality** means not equal.

We will be thinking about values that are **greater than** or **less than** a given value.

On the number line, draw an arrow above all the values that x could be.

If x is greater than 4 we draw a number line from 4 onwards.

The circle at 4 is hollow because it cannot equal 4



> greater than
 < less than
 ≥ greater than or equal to
 ≤ less than or equal to

Maths, Y9 - Equations & inequalities

4. Solving linear inequalities

Solve these just like equations

$$\begin{array}{rcl} 2x - 4 & < & 18 \\ (+4) & & (+4) \\ \hline 2x & < & 22 \\ (\div 2) & & (\div 2) \\ \hline x & < & 11 \end{array}$$

$$\begin{array}{rcl} 10 - x & < & 6 \\ (+x) & & (+x) \\ \hline 10 & < & 6 + x \\ (-6) & & (-6) \\ \hline 4 & < & x \\ & & x > 4 \end{array}$$

5. Expanding double brackets

$$(x + 2)(x + 3)$$

×	x	2
x	x^2	$2x$
3	$3x$	6

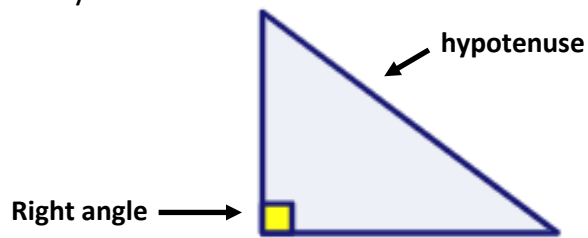
$$\begin{aligned} &= x^2 + 2x + 3x + 6 \\ &= x^2 + 5x + 6 \end{aligned}$$

$$(2x - 5)(x + 3)$$

×	x	3
2x	$2x^2$	$6x$
-5	$-5x$	-15

$$\begin{aligned} &= 2x^2 + 6x - 5x - 15 \\ &= x^2 + x - 15 \end{aligned}$$

1. Keywords



An 90° angle is called a **right angle**.

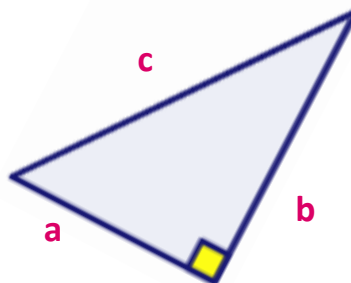
A triangle with a right angle is called a **right angled triangle**.

The longest side is always opposite the right angle.

It is known as the **hypotenuse**.

3. Labelling the sides

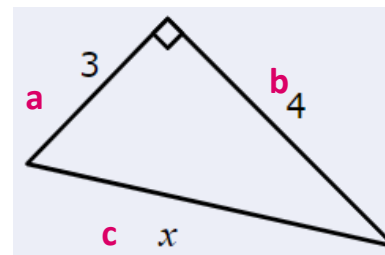
The hypotenuse is usually labelled as **c**, and the shorter sides as **a** and **b**.



4. The formula

$$a^2 + b^2 = c^2$$

5. Finding a missing side (hypotenuse)



$$a^2 + b^2 = c^2$$

$$3^2 + 4^2 = c^2$$

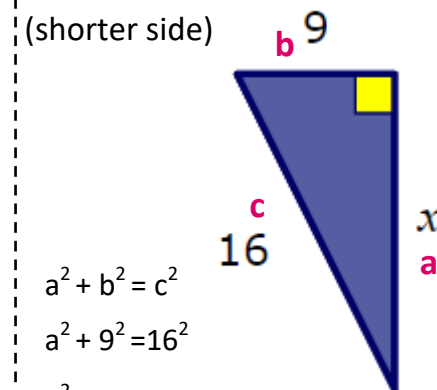
$$9 + 16 = c^2$$

$$c^2 = 25$$

$$c = \sqrt{25}$$

$$c = 5$$

6. Finding a missing side (shorter side)



$$a^2 + b^2 = c^2$$

$$a^2 + 9^2 = 16^2$$

$$a^2 + 81 = 256$$

$$a^2 = 256 - 81$$

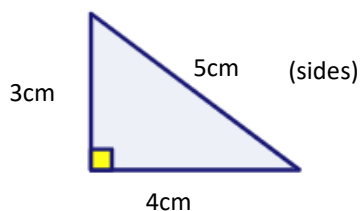
$$a^2 = 175$$

$$a = \sqrt{175}$$

$$a = 13.2 \text{ (1d.p.)}$$

Maths, Y9 - Pythagoras

2. Pythagoras' theorem explained



"For any given right angled triangle. The area of the two smaller squares add up to the area of the largest square."

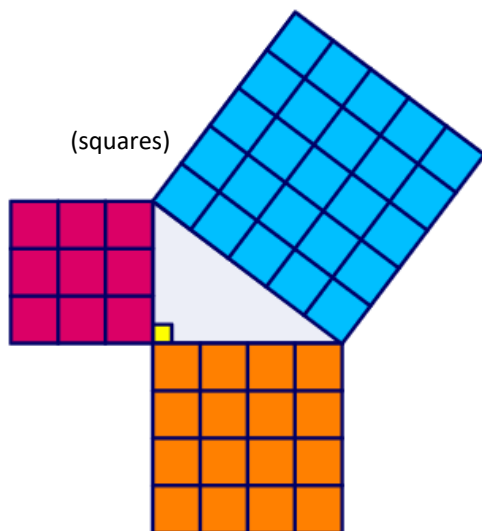
In this case we can see that;

- 1) The square made from the 3cm side has an area of 9cm^2 (9 boxes)
- 2) The square made from the 4cm side has an area of 16cm^2 (16 boxes)
- 3) The square made from the 5cm hypotenuse has an area of 25cm^2 (25 boxes)

Therefore

$$3^2 + 4^2 = 5^2 \text{ (sides)}$$

$$9 + 16 = 25 \text{ (squares)}$$



7. Pythagorean Triples

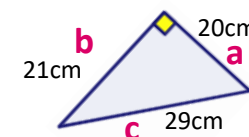
A set of three whole numbers where $a^2 + b^2 = c^2$

Examples;

a	b	c
3	4	5
6	8	10
5	12	13
7	24	15
8	15	17

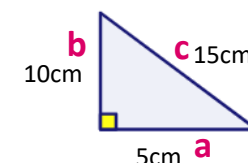
8. Proving a triangle is right angled.

Is $a^2 + b^2$ is equal to c^2 ?



$$20^2 + 21^2 \text{ is equal to } 29^2$$

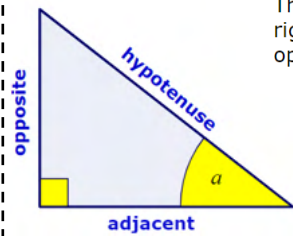
The triangle is right angled.



$$5^2 + 10^2 \text{ is NOT equal to } 15^2$$

The triangle is NOT right angled.

1. Labelling the sides



The **hypotenuse** is the **longest side** of a right-angled triangle. It is always the one opposite the right angle.

The **opposite** is the side that is **opposite the angle** that we are interested in. On the diagram this is a .

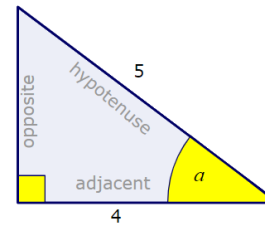
The **adjacent** is the side that is **next to** this angle.

4. Find a missing angle using cosine

In this triangle we know the **adjacent** and **hypotenuse**.

$$\begin{aligned}\cos a^\circ &= \frac{\text{adjacent}}{\text{hypotenuse}} \\ &= \frac{4}{5} \\ &= 0.8\end{aligned}$$

$$a = \cos^{-1}(0.8) = \mathbf{36.87} \text{ (2 d.p.)}$$

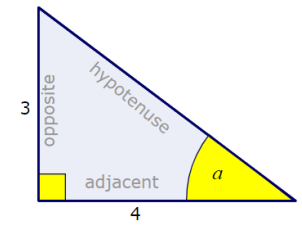


5. Find a missing angle using tangent

In this triangle we know the **opposite** and **adjacent**.

$$\begin{aligned}\tan a^\circ &= \frac{\text{opposite}}{\text{adjacent}} \\ &= \frac{3}{4} \\ &= 0.75\end{aligned}$$

$$a = \tan^{-1}(0.75) = \mathbf{36.87} \text{ (2 d.p.)}$$



Year 9 - Trigonometry

2. Trigonometry explained

The sides and angles of right angled triangles are related to one another according to specific ratios.

These ratios are known as trigonometric ratios;

1) **Sine** (sin). Where

$$\sin a^\circ = \frac{\text{opposite}}{\text{hypotenuse}}$$

2) **Cosine** (cos). Where

$$\cos a^\circ = \frac{\text{adjacent}}{\text{hypotenuse}}$$

3) **Tangent** (tan). Where

$$\tan a^\circ = \frac{\text{opposite}}{\text{adjacent}}$$

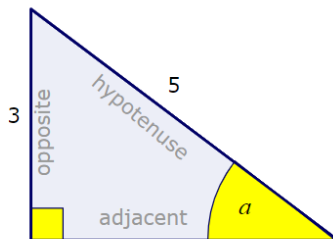
We will be using these ratios to determine the size of **missing sides or angles**.

3. Find a missing angle using sine

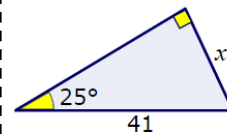
In this triangle we know the **opposite** and **hypotenuse**.

$$\begin{aligned}\sin a^\circ &= \frac{\text{opposite}}{\text{hypotenuse}} \\ &= \frac{3}{5} \\ &= 0.6\end{aligned}$$

$$\begin{aligned}a &= \sin^{-1}(0.6) \\ a &= \mathbf{36.87} \text{ (2 d.p.)}\end{aligned}$$



6. Finding missing sides using sine



We know the **opposite** and **hypotenuse**.

x is opposite and 41 is the hypotenuse.

We use the **sine** function.

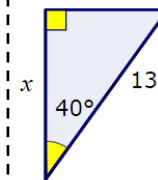
$$\begin{aligned}\text{write out the formula: } \sin a &= \frac{\text{opp}}{\text{hyp}} \\ \text{substitute the values: } \sin 25^\circ &= \frac{x}{41} \\ \text{rearrange: } 41 \sin 25^\circ &= x \\ \text{calculate } 41 \sin 25^\circ \text{ to 2 d.p.:} \\ x &= \mathbf{17.33}\end{aligned}$$

Sometimes we have to do a little more rearranging.

Find the length x .

$$\begin{aligned}\sin 62^\circ &= \frac{\text{opp}}{\text{hyp}} \\ \sin 62^\circ &= \frac{7}{x} \\ x \sin 62^\circ &= 7 \\ x &= \frac{7}{\sin 62^\circ} \\ x &= \mathbf{7.9}\end{aligned}$$

7. Finding missing sides using cosine



We know the **adjacent** and **hypotenuse**.

x is adjacent and 13 is the hypotenuse.

We use the **cosine** function.

$$\begin{aligned}\text{write out the formula: } \cos a &= \frac{\text{adj}}{\text{hyp}} \\ \text{substitute the values: } \cos 40^\circ &= \frac{x}{13} \\ \text{rearrange: } 13 \cos 40^\circ &= x \\ \text{calculate answer to 2 d.p.:} \\ x &= \mathbf{9.96}\end{aligned}$$

Sometimes we have to do a little more rearranging.

Find the length x .

$$\begin{aligned}\cos 62^\circ &= \frac{\text{adj}}{\text{hyp}} \\ \cos 62^\circ &= \frac{3.7}{x} \\ x \cos 62^\circ &= 3.7 \\ x &= \frac{3.7}{\cos 62^\circ} \\ x &= \mathbf{7.9}\end{aligned}$$

8. Finding missing sides using tangent

We know the **opposite** and **adjacent**

x is opposite and 24 is the adjacent.

We use the **tangent** function.

$$\begin{aligned}\text{write out the formula: } \tan a &= \frac{\text{opp}}{\text{adj}} \\ \text{substitute the values: } \tan 13^\circ &= \frac{x}{24} \\ \text{rearrange: } 24 \tan 13^\circ &= x \\ \text{calculate } 24 \tan 13^\circ \text{ to 2 d.p.:} \\ x &= \mathbf{5.54}\end{aligned}$$

Sometimes we have to do a little more rearranging.

Find the length x .

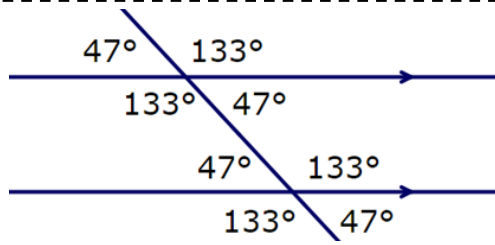
$$\begin{aligned}\tan 62^\circ &= \frac{\text{opp}}{\text{adj}} \\ \tan 62^\circ &= \frac{7}{x} \\ x \tan 62^\circ &= 7 \\ x &= \frac{7}{\tan 62^\circ} \\ x &= \mathbf{3.7}\end{aligned}$$

1. Key words

Parallel lines run in exactly the same direction and never meet. Parallel lines are shown by arrows.

When a straight line crosses two or more parallel lines, **corresponding**, **alternate** and **co-interior** angles are formed.

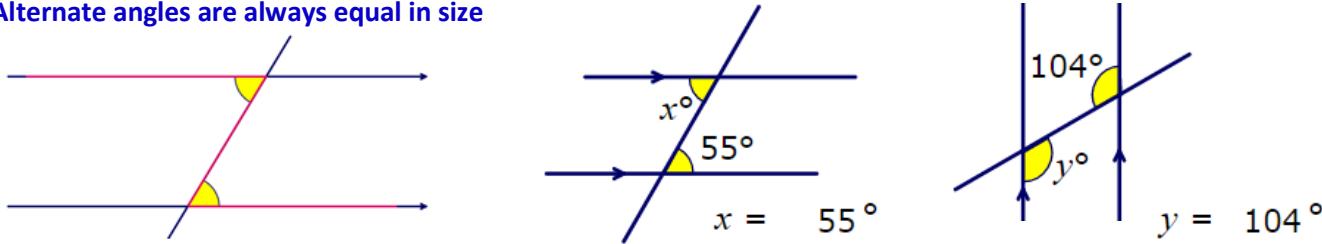
There are only 2 angle measures among all 8 angles created by parallel lines and a crossing straight line



2. Alternate angles

Alternate angles are formed on opposite (alternate) sides of a line which crosses two or more parallel lines.

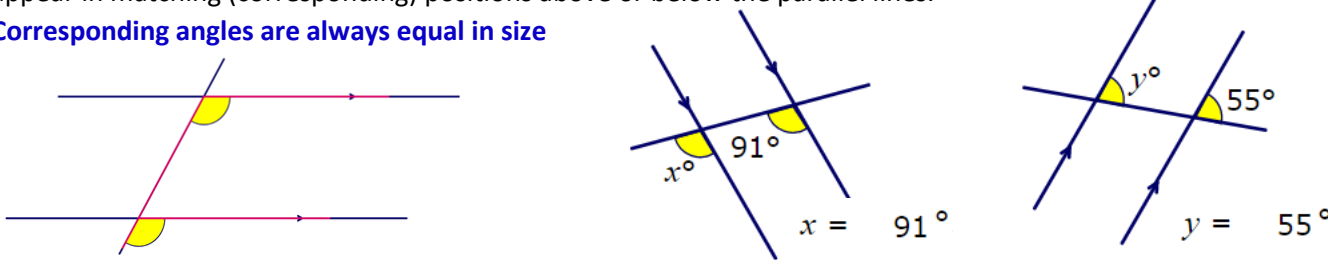
Alternate angles are always equal in size



3. Corresponding angles

Corresponding angles are formed on the same side of a line, which crosses two or more parallel lines. They all appear in matching (corresponding) positions above or below the parallel lines.

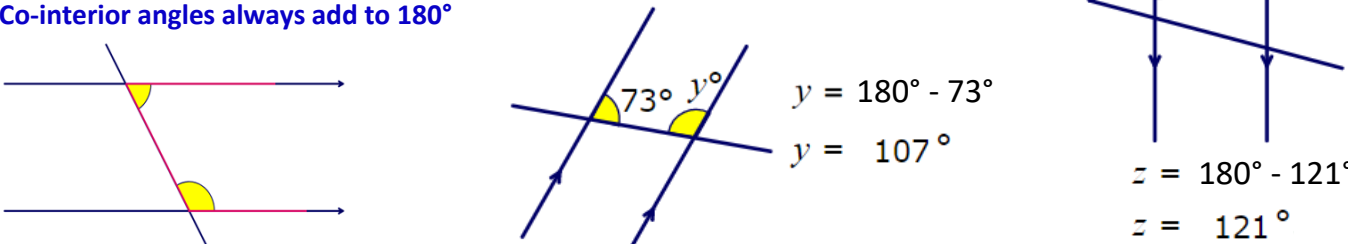
Corresponding angles are always equal in size



4. Co-interior angles

Co-interior angles are formed on the same side of a line, which crosses two or more parallel lines. They appear inside two parallel line, facing each other.

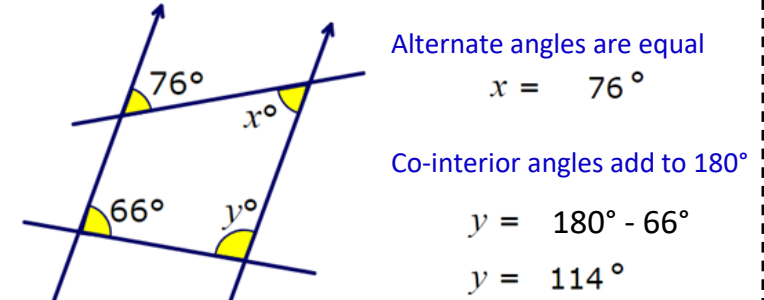
Co-interior angles always add to 180°



Maths, Y9 - Angle reasoning

5. Mixed examples

You must always give reasons for your answers



Angles on a straight line add to 180°

$$180^\circ - 113^\circ = 67^\circ$$

Alternate angles are equal

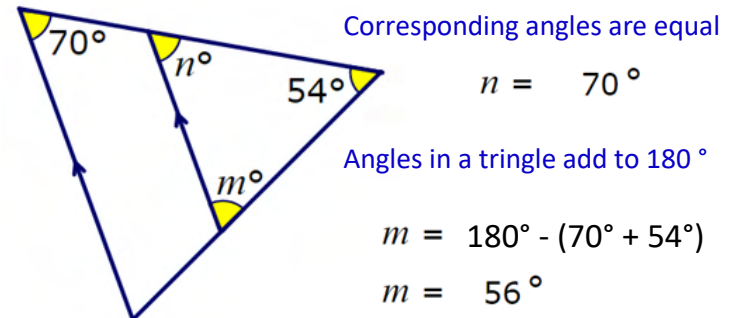
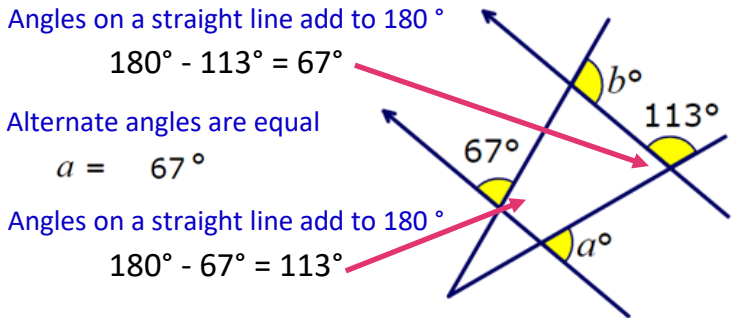
$$a = 67^\circ$$

Angles on a straight line add to 180°

$$180^\circ - 67^\circ = 113^\circ$$

Corresponding angles are equal

$$b = 113^\circ$$



Maths Y9 - Bounds

1. Significant figures

We say that £6 725 000 rounded to **1 significant figure** is £7 000 000.

£7,000,000 (1 s.f.)

£6,700,000 (2 s.f.)

£6,730,000 (3 s.f.)

Significant figures can be abbreviated to s.f. or sig.fig.



More complex, show all significant zeros

Round 4.7982 to 3 significant figures

4.7982



3rd significant figure

The 8 rounds the 9 up, so

4.80 (3 s.f.)

Significant figures v decimal places

Round 26.345 to 1 decimal place

26.3 (1 d.p.)

Round 26.345 to 3 significant figures

26.3 (3 s.f.)

Leading zeros don't count as being significant

Round 0.00024357 to 4 significant figures

2 is the first significant figure

0.0002436 (4 s.f.)

2. Estimation

Estimate the cost per person if I buy 49 cake, each costing £3.09 for 102 people.

Round each number to one significant figure

The approximate calculation is: $\frac{50 \times 3}{100} = \frac{150}{100}$

this gives an approximate answer of: **£1.50**

Estimate the answer to this calculation

$$623.93 \times (2.2 + 2.1)$$

$$\approx 600 \times (2 + 2)$$

$$= 600 \times (4)$$

$$= \mathbf{2400}$$

If numbers are rounded down, it is an underestimation



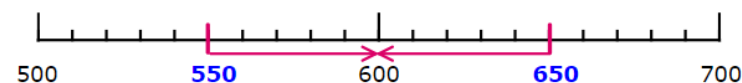
3. Upper and lower bounds

The distance from London to Edinburgh is 600km, rounded to the nearest 100km.

Find the upper and lower bounds.

The smallest it can be is 550km, so the **lower bound** is **550km**.

The largest it can be is 649.999999...km, this number can get infinitely close to 650km, so we say the **upper bound** is **650km**.

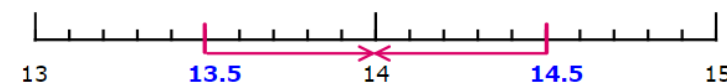


A pencil is 14cm, rounded to the nearest cm.

Find the upper and lower bounds.

The smallest it can be is 13.5cm, so the **lower bound** is **13.5cm**.

The largest it can be is 14.499999...cm this number can get infinitely close to 14.5cm, so we say the **upper bound** is **14.5cm**.



4. Error intervals - Truncation

Truncation occurs when all less significant numbers are just ignored, always rounding down e.g. age 13.

We often truncate answers to division questions.

There are 56 eggs. If an egg box holds 6 eggs, how many egg boxes can they fill?

$$56 \div 6 = 9.333...$$

This means that 56 eggs fill 9 boxes and one third of another, so there will be **9 full boxes**.

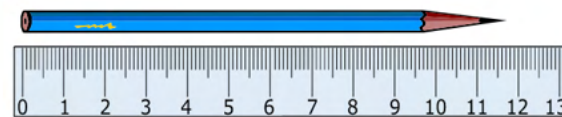


What is the interval of the number of eggs that will fill 9 boxes?

$9 \times 6 = 54$ eggs fill exactly 9 boxes
and $10 \times 6 = 60$ eggs fill exactly 10 boxes.

$$\mathbf{54 \leq \text{number of eggs} < 60}$$

5. Error Intervals - Rounding



The pencil is 12cm long to the nearest cm.

The smallest it can be is 11.5 cm

The largest is 12.499999.....cm tricky?

We can write the **interval** that rounds to 12 as an inequality.

$$11.5 \text{ cm} \leq \text{length} < 12.5 \text{ cm}$$

1. Compound units

A. Speed, distance, time

Speed is the **distance** travelled per unit of **time**

A cyclist travels 400 kilometres in 8 hours.

What is his average speed?

$$\text{speed} = \frac{\text{distance}}{\text{time}} = \frac{400 \text{ km}}{8 \text{ h}}$$



$$= 400/8 \text{ km/h}$$

$$= \mathbf{50 \text{ km/h}}$$

$$\text{speed} = \frac{\text{distance}}{\text{time}}$$

Rearrange
to get the
others

$$\text{distance} = \text{speed} \times \text{time}$$

$$\text{time} = \frac{\text{distance}}{\text{speed}}$$

B. Density, mass, volume

Density is the amount of **mass** per unit of **volume**

A bath sponge is roughly a cuboid, 10cm by 8cm by 3cm Its mass is 180grams.

What is its density?

$$\text{Its volume is } 10 \times 8 \times 3 = \mathbf{240 \text{ cm}^3}.$$

$$\text{Its density} = \frac{\text{mass}}{\text{volume}} = \frac{180 \text{ g}}{240 \text{ cm}^3}$$

$$= 180/240 \text{ g/cm}^3$$

$$= \mathbf{0.75 \text{ g/cm}^3}$$

$$\text{density} = \frac{\text{mass}}{\text{volume}}$$

Rearrange
to get the
others

$$\text{mass} = \text{density} \times \text{volume}$$

$$\text{volume} = \frac{\text{mass}}{\text{density}}$$

C. Pressure, force, area

Pressure is the amount of **force** per unit of **surface area**

A man weighs 800 newtons and his footprints cover an area of 0.05m²

How much pressure does he put on the floor?

$$\text{pressure} = \frac{\text{force}}{\text{surface area}} = \frac{800 \text{ N}}{0.05 \text{ m}^2}$$

$$= 800/0.05 \text{ N/m}^2$$

$$= \mathbf{16000 \text{ N/m}^2}$$



$$\text{pressure} = \frac{\text{force}}{\text{surface area}}$$

Rearrange to get the others

$$\text{force} = \text{pressure} \times \text{surface area}$$

$$\text{surface area} = \frac{\text{force}}{\text{pressure}}$$

2. Standard form

A. Large numbers

Standard form is another way of writing very large numbers

The first number must always be greater than or equal to 1 and less than 10.

For large number the power will be positive.

$$1,360,000 = 1.36 \times 1,000,000$$

$$\text{we know that: } 1,000,000 = 10^6$$

$$\text{therefore: } 1,360,000 = 1.36 \times 10^6$$

1,360,000 is the **ordinary number**

1.36×10^6 is the **standard form**

B. Small numbers

Standard form is also a way of writing very small numbers

The first number still must be greater than or equal to 1 and less than 10.

For small numbers the power will be negative.

$$0.00535 = 5.35 \times 0.001$$

$$\text{we know that: } 0.001 = 10^{-3}$$

$$\text{therefore: } 0.00535 = 5.35 \times 10^{-3}$$

Hint: Count how many places left the digits move so that the decimal point sits just after the first non-zero figure.

Maths Y9 - Compound Units & Standard Form

3. Calculating with standard form (non-calculator)

A. Multiplying and dividing

$$\text{Calculate } 7.5 \times 10^3 \times 3 \times 10^3$$

Give your answer in standard form.

$$\text{rewrite with the coefficients at the start: } = 7.5 \times 3 \times 10^3 \times 10^3$$

$$\text{multiply the coefficients: } = 22.5 \times 10^3 \times 10^3$$

$$\text{add the indices to multiply the powers of 10: } = 22.5 \times 10^6$$

$$\text{rewrite in standard form: } = 2.25 \times 10^7$$

$$\text{Calculate } \frac{2.5 \times 10^2}{5 \times 10^6}$$

Give your answer in standard form.

$$\text{split the division, to divide the coefficients and powers separately: } = \frac{2.5}{5} \times \frac{10^2}{10^6}$$

$$\text{divide the coefficients: } = 0.5 \times \frac{10^2}{10^6}$$

$$\text{subtract the indices to divide the powers of 10: } = 0.5 \times 10^{-4}$$

$$\text{rewrite in standard form: } = 5 \times 10^{-5}$$

B. Adding and subtracting

$$\text{Calculate } 7.5 \times 10^3 + 5.25 \times 10^5$$

Give your answer in standard form.

$$\text{rewrite the with the same power of 10: } = 7.5 \times 10^3 + 525 \times 10^3$$

$$= (7.5 + 525) \times 10^3$$

$$\text{add the coefficients: } = 532.5 \times 10^3$$

$$\text{rewrite in standard form: } = 5.325 \times 10^5$$

$$\text{Calculate } 1.25 \times 10^5 - 8.2 \times 10^4$$

Give your answer in standard form.

$$\text{rewrite with the same power of 10: } = 1.25 \times 10^5 - 0.82 \times 10^5$$

$$= (1.25 - 0.82) \times 10^5$$

$$\text{subtract the coefficients: } = 0.43 \times 10^5$$

$$\text{rewrite in standard form: } = 4.3 \times 10^4$$

Year 9 French Autumn Half Term 1 Etre ado, c'est quoi ?

Nous sommes cinq (There are five of us) Dans ma famille il y a trois personnes (In my family there are three people)	il y a (there is)	mon père (my dad) mon beau-père (my stepdad) mon grand-père (my granddad) mon frère (my brother) mon demi-frère (my stepbrother/ half brother) mon oncle (my uncle) mon cousin (my cousin) mon neveu (my nephew)	ma mère (my mum) ma belle-mère (my stepmum) ma grand-mère (my grandma) ma sœur (my sister) ma demi-sœur (my stepsister/ half sister) ma tante (my aunt) ma cousine (my cousin) ma nièce (my niece)	mes parents (my parents) mes grands-parents (my grandparents) mes frères (my brothers) mes sœurs (my sisters)
--	-------------------------------------	--	--	---

Je n'ai pas de (I don't have a / any)	neveu (nephew)	tante (aunt)	cousins (cousins)
--	-----------------------	---------------------	--------------------------

Je suis enfant unique (I am an only child)	Je n'ai pas de frères et de sœurs (I don't have any brothers and sisters)
---	--

J'ai un frère (I have a brother) J'ai un grand frère (I have a big brother) J'ai un frère aîné (I have an older brother) J'ai un frère cadet (I have a younger brother) J'ai un petit frère (I have a little brother) J'ai un frère jumeau (I have a twin brother)	J'ai une sœur (I have a sister) J'ai une grande sœur (I have a big sister) J'ai une sœur aînée (I have an older sister) J'ai une petite sœur (I have a little sister) J'ai une sœur cadette (I have a younger sister) J'ai une sœur jumelle (I have a twin sister)	qui s'appelle ... (who is called).	J'ai deux frères (I have two brothers) J'ai deux frères aînés (I have two older brothers) J'ai des frères jumeaux (I have twin brothers) J'ai trois sœurs (I have three sisters) J'ai des sœurs jumelles (I have twin sisters) J'ai trois sœurs cadettes (I have three younger sisters)	qui s'appellent ... (who are called ...)
--	--	--	---	--

J'ai (I have) noirs/ blonds/roux/ châains (black/blond/ginger/ brown) Il a (he has) les cheveux courts/ mi-longs/ longs (short/medium length / long) Elle a (she has) frisés/ bouclés/ raides/ (curly/ wavy/ straight)

Mon frère a (My brother is- literally 'has') Ma sœur a (My sister is- literally 'has') Mes frères ont (My brothers are - literally 'have') Mes sœurs ont (My sisters are- literally 'have')	six mois (6 months) un an (1 year) deux ans (2 years) trois ans (3 years) onze ans (11 years)	douze ans (12 years) treize ans (13 years) quatorze ans (14 years) quinze ans (15 years)	seize ans (16 years) dix-sept ans (17 years) dix-huit ans (18 years) dix-neuf ans (19 years)	vingt ans (20 years) vingt et un ans (21 years) vingt-deux ans (22 years)
---	---	--	--	---

Mon anniversaire c'est le premier septembre. (My birthday is on 1st September) . Mon anniversaire c'est le dix-huit octobre. (My birthday is on 18th October.)



Grammaire p. 169 WB p.6

The verb avoir (to have)

j'ai (I have)	nous avons (we have)
tu as (you have singular)	vous avez (you guys have)
il/elle a (he/she has)	ils ont (they have masc.)
on a (we have, one has)	elles ont (they have fem.)

Grammaire p. 168-169 WB p.8

Present tense of être (to be) 13.

je suis (I am)	nous sommes (we are)
tu es (you are singular)	vous êtes (you guys are)
il/elle est (he/she is)	ils sont (they are masc.)
on est (we are, one is)	elles sont (they are fem.)



<https://quizlet.com/gb/602518486/allez-2-unit-41-flash-cards/>

Year 9 French Autumn Half Term 1 Etre ado – c'est quoi ?

J'adore (I love) J'aime (I like) J'aime beaucoup (I like a lot/ I really like) Je m'entends bien avec (I get on well with) Je n'aime pas (I don't like) Je n'aime pas trop (I don't really like) Je ne m'entends pas bien avec (I don't get on well with)		ma mère (my mum) ma soeur (my sister)	car elle est (because she is) mais elle est (but she is)	casse-pieds (irritating) compréhensive (understanding) égoïste (selfish) énervante (annoying) forte (strong)	généreuse (generous) gentille (kind) mignonne (cute) odieuse (horrible) ouverte (open minded) radine (stingy)	rigolote (funny) serviable (helpful) stricte (strict) têtue (stubborn) travailleuse (hardworking)
		mon frère (my brother) mon père (my dad)	car il est (because he is) mais il est (but he is)	casse-pieds (irritating) compréhensif (understanding) égoïste (selfish) énervant (annoying) fort (strong)	généreux (generous) gentil (kind) mignon (cute) odieux (horrible) ouvert (open minded) radin (stingy)	rigolo (funny) serviable (helpful) stricte (strict) têtu (stubborn) travailleur (hardworking)
On s'entend bien (We get on well) On ne s'entend pas bien (We don't get on well)						
et par contre (however)	il (he) elle (she)	m'aide (helps me) me comprend (understands me) me donne de l'argent de poche (gives me pocket money) me fait confiance (trusts me)	me laisse sortir (lets me go out) m'écoute listens to me) me fait rire (makes me laugh) me respecte (respects me) me soutient (supports me) ne se fâche jamais (never gets angry)	me critique tout le temps (criticises me all the time) m'énerv e (gets on my nerves)	me juge (judges me) ne me comprend pas (doesn't understand me) se fâche facilement (gets angry easily)	


Grammaire

p.166, p.168
 WB p.11–12, p.24

Pronouns: *me, te, se*

On pages 58–59, *me* and *te* are used as object pronouns:

me	<i>me, to me</i>	te	<i>you, to you</i>
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Se is a reflexive pronoun:

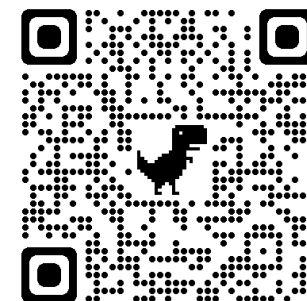
se	<i>(to) himself/herself/ourselves/each other/themselves</i>
-----------	---

Ils me traitent comme un bébé. – They treat **me** like a baby.

Ton père te fait confiance. – Your dad trusts **you**.

On se parle. – We talk **to each other**.

Negative: *On ne se parle pas.* – We **don't** talk **to each other**.



<https://quizlet.com/gb/530530843/allez-2-unit-41-flash-cards/>

A l'avenir (in the future)
Plus tard (later)
Quand je serai plus âgé
(when I am older)

<https://quizlet.com/gb/326984977/etre-ado-cest-quoi-flash-cards/>

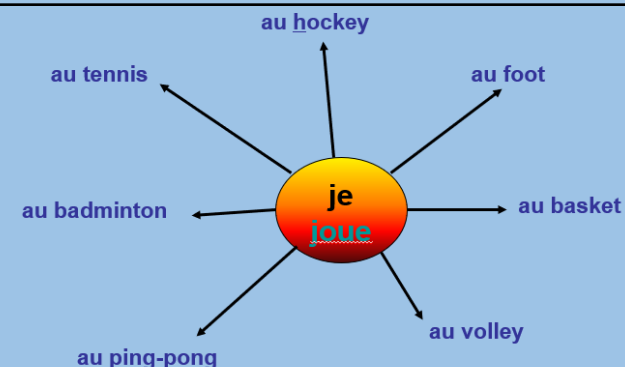


je voudrais (I'd like)
j'aimerais (I'd love)

me marier car (to get married because)
c'est important pour moi (it's important for me)
je voudrais porter une robe blanche (I'd like to wear a white dress)
je suis pratiquante (I'm religious)
j'aimerais avoir des enfants.

pas me marier car (not to get married because)
ce n'est pas important pour moi (it's not important for me)
ce n'est qu'un morceau de papier (it's only a bit of paper)

Que fais-tu le week-end ? (what do you do at the week-end)
tous les week-ends / le week-end (at the week-end)
quand j'ai le temps (when I've got time)



A mon avis,
Selon moi,
D'après moi,
Si on demande mon avis
(in my opinion)

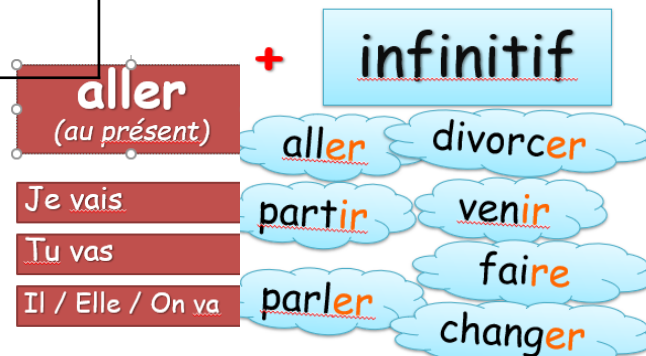
mon partenaire idéal serait
ma partenaire idéale serait
(my ideal partner)

très (very)
assez (quite)
parfois / quelquefois
(sometimes)
souvent (often)
tout le temps (all the time)
vraiment (really)
de temps en temps (from time to time)

déterminé/e (determined)
sportif/ve (sporty)
honnête (honest)
marrant/e (fun)
beau/belle (pretty)
intelligent /e (smart)
généreux/se (generous)
compréhensif/ve (understanding)
fort /e (strong)



GRAMMAIRE
the near future



I'm going to go
I'm going to divorce
I'm going to leave
I'm going to come
I'm going to talk
I'm going to do
I'm going to change

j'écoute de la musique (I listen to music)
je vais en ville (I go to town)
je vais à la piscine (I go to the swimming pool)
je regarde Netflix (I watch Netflix)
je joue à des jeux vidéos (I play video games)

A l'avenir
Plus tard

THE PERFECT TENSE

Bonjour

Easy as 1-2-3

<https://quizlet.com/568867435/la-technologie-flash-cards/>

technology-flash-cards/



1

First comes the **subject**. This is the person doing the action. Remember:
Je - Tu - Il - Elle - On - Nous - Vous - Ils - Elles
But it could also be Marc, Celine, Mes parents, La glace, Le professeur
It is whoever is doing the verb!



What is the Perfect Tense?

In French you use the Perfect Tense (le passé composé) to say what you have done at a certain time in the past.

2

This is the part of **avoir** or **être**, known as the auxilliary:

J'ai
Tu as
Il/elle/on a
Nous **avons**
Vous **avez**
Ils / elles **ont**



Je suis
Tu es
Il/elle/on est
Nous **sommes**
Vous **êtes**
Ils/elles **sont**

How do you know which one to use?
If it's one of the MRS VAN DER TRAMP verbs (see right), then it's être, otherwise it's avoir.

MRS VAN DER TRAMP

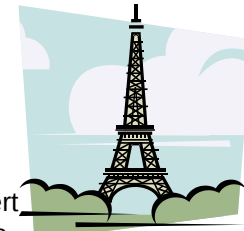
These verbs take **être**

Mourir (to die) - mort
Retourner (to return) - retourné
Sortir (to go out) - sorti
Venir (to come) - venu
Arriver (to arrive) - arrivé
Naître (to be born) - né
Descendre (to go down) - descendu
Entrer (to enter) - entré
Rentrer (to return) - rentré
Tomber (to fall) - tombé
Rester (to stay) - resté
Aller (to go) - allé
Monter (to go up) - monté
Partir (to leave) - parti



IRREGULAR PAST PARTICIPLES:

Apprendre (to learn) - appris
Avoir (to have) - eu
Boire (to drink) - bu
Comprendre (to understand) - compris
Courir (to run) - couru
Dire (to say) - dit
Écrire (to write) - écrit
Faire (to do) - fait
Lire (to read) - lu
Mettre (to put) - mis
Ouvrir (to open) - ouvert
Prendre (to take) - pris
Recevoir (to receive) - reçu
Voir (to see) - vu



THERE ARE MANY MORE THAN THIS!

3

This is the **PAST PARTICIPLE**.

For **most** verbs (regular verbs) you can follow the simple rules to change the infinitive to the past participle:

For -ER verbs, take off the ER and add an É

For -IR verbs, take off the IR and add an I

For -RE verbs, take off the RE and add a U

Regarder → Regardé

Finir → Fini

Répondre → Répondu



HOWEVER lots of verbs are **irregular** and we need to learn the past participles of these.

(17 of the Top 20 most used french verbs are irregular!!)

DON'T FORGET TO MAKE THE PP 'AGREE' IF IT IS AN ÊTRE VERB! (see right)

DON'T FORGET to make the Past Participle **agree** with the subject (who is doing the action) if it goes with être.

For feminine, add an extra **E**

For masculin plural, add an **S**

For feminine plural, add **ES**

Eg. Elle est allée
Nous sommes allé(e)s
Ils sont allés



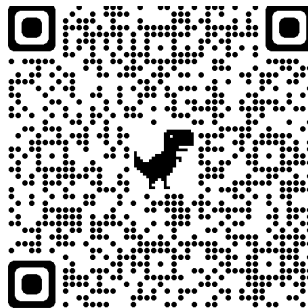
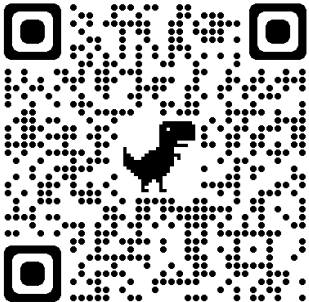
¿Te llevas bien con tu familia?	Do you get on with your family?
Me llevo bien con...	I get on well with...
Me lleva fatal con...	I get on awfully with...
Criticar	To criticise
Discutir	To argue
Enfadarse	To get angry
Gritar	To shout
Llegar a casa	To arrive home
Pelearse	To fight/argue
Respetar	To respect
Volver a casa	To return home
Estar de acuerdo	To be in agreement
Estar en contra	To be against

La abuela	Grandma
El abuelo	Grandad
La hermana	Sister
El hermano	Brother
La hija	Daughter
El hijo	Son
Madrastra	Stepmum
Padrastro	Stepdad
La tía	Aunt
El tío	Uncle

Es...	He/she is...
Estricto/a	Strict
Incompatible	Incompatible
Injusto/a	Unfair
Justo/a	Fair
Razonable	Reasonable
Alegre	Happy
Alto/a	Tall
Amable	Kind
Anciano/a	Old
Calvo/a	Bald
Cariñoso/a	Affectionate
Corto/a	Short
Delgado/a	Thin
Gracioso/a	Funny
Guapo/a	Good looking
Joven	Young
Largo/a	Long
Liso/a	Straight
Viejo/a	Old



Tiene...	He / she has...]
El pelo...	Hair...
Los ojos...	Eyes...
La barba	Beard
El bigote	Moustache
Pecas	Freckles
Castaño	Brown/Chestnut
Rizado/a	Curly
Pelirrojo	Red(haired)



<https://quizlet.com/415411656/claro-2-term-5-week-3-te-he-dicho-que-no-flash-cards/>

<https://quizlet.com/gb/273198924/11g-como-es-tu-familia-appearance-flash-cards/>



¿De quien estás enamorado?	Who are you in love with?
Estoy enamorado de...	I am in love with...
El marido	Husband
La mujer	Woman/Wife
La novia	Girlfriend/Fiancée
El novio	Boyfriend/Fiancée
La pareja	Pair/Partner
Los parientes	Relatives
El invitado	Guest
Ya no	No longer

1

El beso	Kiss
Echar de menos	To miss someone
Cada vez más	More and more
Cocinar	To cook
Comprar	To buy
Feliz	Happy
Maleducado	Rude
Parecer	To seem
Pelear(se)	To fight
El piso	Flat, apartment
Serio/a	Serious
Sonreírse	To smile
Las vacaciones	Holidays

2

Using possessive adjective:

Possessive adjectives are words that indicate who something or someone belongs to. In English these words are 'my', 'your', 'his', 'her', 'its', 'our' and 'their'. The equivalent words in Spanish have to agree with the word that follows, depending whether that word is singular or plural and, in some cases, whether it is masculine or feminine:

mi(s) – my

tu(s) – your

su(s) – his/her/its

nuestro/a/os/as – our

vuestro/a/os/as – your

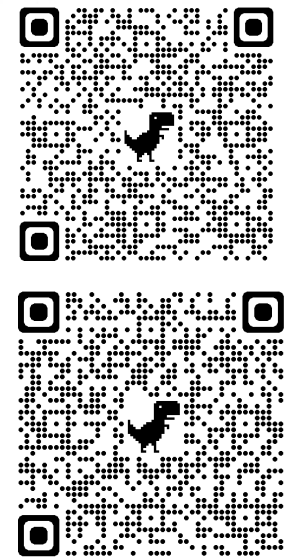
su(s) – their

Mi rutina	My routine
Desayuno	I have breakfast
Me despierto	I wake up
Me levanto	I get up
Me ducho	I shower
Voy al insti	I go to school
Me lavo los dientes	I brush my teeth
Me peino	I brush my hair
Me visto	I get dressed

3

A menudo	Often
A veces	Sometimes
antes	Before
después	After
durar	To last
inmediatamente	Immediately
luego	After
mientras	Whilst
nunca	Never
raras veces	Rarely
siempre	Always
deprisa	Fast, quickly
tener prisa	To be in a hurry

4



<https://quizlet.com/240836994/aqa-gcse-spanish-foundation-unit-1-me-my-family-and-friends-flash-cards/>

<https://quizlet.com/415411491/claro-2-term-5-week-1-lo-que-hago-por-las-mananas-flash-cards/>

Me gusta...	I like...
Odio...	I hate
descargar música	to download music
gastar batería	to waste/use battery
hacer la compra	to do shopping online
jugar a videojuegos	to play videogames
llamar por videollamada	to make a videocall
sacar fotos	to take photos
subir fotos	to upload photos
ver vídeos	to watch videos

1

Por la red...	On the internet....
cambio mi estado	I change my status
comento las fotos	I comment on photos
doy me gusta	I like
hago videos en directo	I make live videos
leo las noticias	I read the news
pongo efectos	I add effects
pongo filtros	I add filters
subo selfis	I upload selfies

2



iArriba, arriba!

To make your negative expressions more impressive, use **casi** ('almost'):

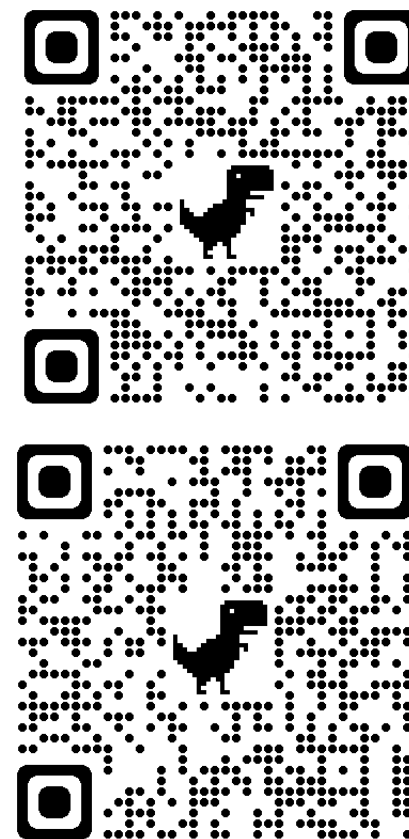
casi nadie almost no one
casi nada almost nothing
casi nunca almost never

la aplicación/la app	The app
las compras	Shopping
la connexion wifi	WiFi connection
la cuenta	Account
el navegador	Sat-nav
la radio digital	Digital radio
el supermecado virtual	Virtual supermarket
la tablet	Tablet

3

estoy de moda	I am in fashion
estoy bien informado/a	I am well informed
estoy obsesionado	I am obsessed

4



<https://quizlet.com/gb/439723406/claro-2-31-flash-cards/>
<https://quizlet.com/gb/439722235/claro-2-35-flash-cards/>

Dance Music

Exploring Rhythm, Chords and Metre in Music for Dance

The RHYTHMS of dance music always match the STEPS of the dance: the two are inter-related. Dance music is based on CHORD PATTERNS: mainly PRIMARY CHORDS (I, IV & V(7)) and has a clear MELODY with an ACCOMPANIMENT (HOMOPHONIC TEXTURE). Different dances and their music use different METRES/TIME SIGNATURES.



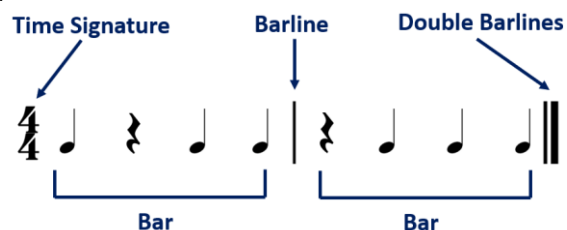
A. Pulse, Time and Metre in Dance Music

The **BEAT** or **PULSE** of dance music is always **REGULAR**. Here is a regular crotchet pulse of 12 beats:



A single **BEAT** is a basic unit of musical time. In dance music, beats are grouped together to make a repeating pattern – normally made up of either two, three or four.

The repeating pattern of beats gives us the **METRE** or the **TIME** of the music, shown by the **TIME SIGNATURE** at the start of a piece of music. Each repetition of the beat-pattern is called a **BAR** and bars are separated by vertical lines called **BARLINES**. A **DOUBLE BARLINE** always comes at the end of a piece of music or section of music.



The **TOP NUMBER** of a time signature tells you how many beats there are in each bar. The **BOTTOM NUMBER** tells you what types or note values these beats are (as divisions of a semibreve = 1):

- 1 = Semibreve
- 2 = Minim
- 4 = Crotchet
- 8 = Quaver
- 16 = Semiquaver

4/4 can also be shown by a "C" meaning COMMON TIME



B. Simple Time in Dance Music

SIMPLE DUPLÉ METRE: Two beats to a bar



Dance music such as **MARCHES**, the **TANGO** and **IRISH REEL** often use simple duplé metre.

SIMPLE TRIPLE METRE: Three beats to a bar



Dance music such as **WALTZES** and the **MINUET**, **COURANTE** and **SARABANDE** from the Baroque Dance Suite often use simple triple metre.

SIMPLE QUADRUPLE METRE: Four beats to a bar



Dance music such as the **TANGO**, the **IRISH REEL**, the **ALLEMANDE** from The Baroque Dance Suite, **AMERICAN LINE DANCE MUSIC** (Country and Western), **DISCO** and **CLUB DANCE** often use simple quadruple metre.

C. Simple and Compound Time

	Simple Time Signatures	Compound Time Signatures
Duple Metre	$\frac{2}{4}$ $\frac{3}{4}$ $\frac{2}{8}$	$\frac{6}{8}$ $\frac{4}{4}$ $\frac{6}{16}$
Triple Metre	$\frac{3}{4}$ $\frac{3}{8}$ $\frac{3}{16}$	$\frac{9}{8}$ $\frac{3}{4}$ $\frac{9}{16}$
Quadruple Metre	$\frac{4}{4}$ $\frac{4}{8}$ $\frac{4}{16}$	$\frac{12}{8}$ $\frac{12}{4}$ $\frac{12}{16}$

Dance music such as the **IRISH JIG** and the **GIGUE** from the Baroque Dance Suite often use compound duple metre (6/8) with a "ONE and a TWO and a" feel to the music.

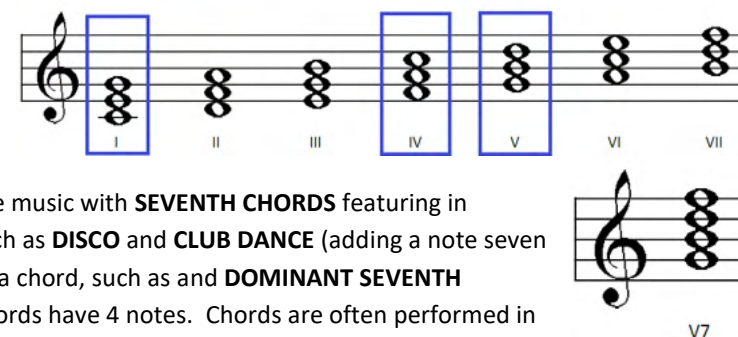
D. Chords in Dance Music

Dance music is based on **CHORD PATTERNS**.

PRIMARY CHORDS:

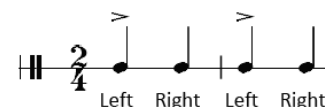
CHORD I, **CHORD IV** and **CHORD V** are most

commonly used in dance music with **SEVENTH CHORDS** featuring in popular dance music such as **DISCO** and **CLUB DANCE** (adding a note seven notes above the root of a chord, such as and **DOMINANT SEVENTH CHORD**). All seventh chords have 4 notes. Chords are often performed in different ways as an **ACCOMPANIMENT** in dance music.

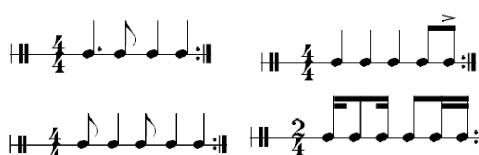


E. Characteristic Rhythms in Dance Music

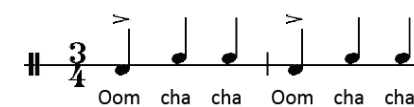
The **MARCH** has a strong **LEFT**, right, **LEFT**, right rhythm:



The **TANGO** has several rhythms:



The **WALTZ** has a strong **OOM**-cha-cha, **OOM**-cha-cha rhythm:



FOUR-ON-THE-FLOOR is a common rhythm in **DISCO** and more modern dance music:

Count	1	and a	2	and a	3	and a	4	and a
Bass Drum	●		●		●		●	
Snare Drum or Hand Claps			●				●	
Hi-Hat	●●		●●		●●		●●	
Cymbal								

F. Marches  Often with military connections or performed at ceremonies by large groups together. SIMPLE DUPLÉ METRE (2/4 time signature), although some marches can be in 4/4). Strong emphasis on the first beat of the bar (LEFT, right, LEFT, right). Clear MELODY and ACCOMPANIMENT (HOMOPHONIC TEXTURE). Uses mainly PRIMARY CHORDS (I, IV & V). Often performed by MARCHING BANDS featuring BRASS, DRUMS and PERCUSSION.	G. The Waltz  A PAIRED DANCE with couples close, arms around and facing each other. Popular in Vienna and became a fashionable BALLROOM DANCE. SIMPLE TRIPLE METRE (3/4 time signature). Emphasis on first beat of the bar. Clear OOM-cha-cha, OOM-cha-cha rhythm. Clear MELODY and ACCOMPANIMENT (HOMOPHONIC TEXTURE). REGULAR 4-BAR PHRASES. Slow HARMONIC RHYTHM using PRIMARY CHORDS (I, IV & V). Performed by ORCHESTRAS. STRINGS (occasionally WOODWIND) normally have the MELODY LINE.	H. Latin Dance: The Tango  Originated in Argentina and became a popular LATIN BALLROOM DANCE. A dramatic and sensual PAIRED DANCE with close contact, serious expressions, and quick, jerky movements. Characteristic crisp “TANGO RHYTHMS” (see E.) often DOTTED/SYNCOPATED RHYTHMS. SIMPLE DUPLÉ METRE (2/4) or SIMPLE QUADRUPLE METRE (4/4). Often MINOR TONALITY (sometimes MAJOR for contrast). Clear MELODY and ACCOMPANIMENT (HOMOPHONIC TEXTURE). Uses mainly PRIMARY CHORDS (I, IV & V). Instruments such as BANDONEON, VIOLIN, CELLO, DOUBLE BASS (often plucked – PIZZICATO), SPANISH/ACOUSTIC GUITAR, PIANO.	I. The Baroque Dance Suite  Popular between 1600-1750, a collection of shorter dances (MOVEMENTS) grouped together to form a SUITE. Dances included: • ALLEMANDE (German, 4/4, Stately) • COURANGE (French, 3/4, Lively, Dotted Rhythms and Disjunct melody) • SARABANDE (Spanish, 3/2, Slow and Stately, emphasis on 2nd beat of bar) • MINUET (3/4, Elegant, Stately) • GIGUE (6/8, Fast, Lively, Triplet Rhythms) All dances in BINARY FORM (AB) with each section repeated (AABB). Performed by a group of instruments such as HARPSICHORD, LUTE, VIOLIN, CELLO, OBOE, RECORDER, FLUTE.
J. American Line Dance  GROUP SYNCHRONISED DANCE. All dancers face same way standing in lines performing steps at the same time without touching. Accompanied by COUNTRY AND WESTERN MUSIC: CATCHY MELODY, CROTCHET BASS LINE, SIMPLE HARMONY (CHORDS I & V) in crotchets. SIMPLE QUADRUPLE METRE (4/4) POPULAR SONG FORM MAJOR TONALITY Instruments such as GUITARS (Electric and Acoustic), STEEL GUITAR, DRUMS, BANJO, FIDDLE, HARMONICA, ACCORDION.	K. Irish Jig and Reel  Traditional FOLK DANCES from Ireland with intricate footwork and arms by sides. REEL: COMPOUND TIME (6/8); JIG: SIMPLE TIME (2/4 or 4/4) both with “two in a bar” feel, continuous bouncy quaver or semiquaver rhythms, fast tempo and DECORATED melodies. BINARY FORM. MAJOR/MINOR or MODAL. Folk Instruments include: FIDDLE, FLUTE, TIN WHISTLE, ACCORDION, BODHRAN, UILEANN PIPES, HARP.	L. Disco  Appeared in 1970's as an individual, IMPROVISED DANCE in clubs from a mix of jazz, funk and soul. SIMPLE QUADRUPLE METRE (4/4) FAST TEMPO (around 120 BPM) FOUR-ON-THE-FLOOR RHYTHM (see E.) SYNCOPATED bass line parts. Simple CHORD PATTERNS using CHORDS I and V and SEVENTH CHORDS. POPULAR SONG FORM with a strong GROOVE (long repeated rhythm section) and fade out endings, and catchy HOOKS/RIFFS. GUITARS, VOCALS, DRUMS, STRING/BRASS SOUNDS, SYNTHESISERS, SAMPLES.	M. Club Dance  Influenced by MUSIC TECHNOLOGY: samplers, synthesisers, sequencers and drum machines. Various genres: House, Techno, Drum and Bass, Garage, Trance, Ambient. Dancing in individual and IMPROVISED on one spot. SIMPLE QUADRUPLE METRE (4/4). Use of ELECTRONIC SOUNDS. A STRONG BEAT emphasised by the DRUM and STRONG BASS LINES. SHORT PHRASES and REPETITIVE SECTIONS. FAST TEMPO (Ambient is slower/chilled) Complex, layered drum patterns. Inclusion of SAMPLES.



Key words:	
1. Vocation	A religious calling to a certain job or way of life.
2. Discernment	The ability to understand God's calling.
3. Covenant	A promise from God to do something.
4. Fidelity	Faithfulness to a person or belief shown by their commitment.
5. Laity	A member of the Church who is not ordained
6. Ordination	The ceremony where a male becomes a priest.
7. Apostolic	A type of Religious Order with the aim of working in the community
8. Contemplative	A type of Religious Order focussed on prayer

9. John Henry Newman Prayer
God has created me to do Him
some **definite service**.
He has committed some work to me,
which He has not
committed to another.

I am a link in a chain,
a bond of connection between people.
He has **not created me for nothing.**
I shall do good.
I shall do His work.
God our Father,
AMEN

Keyword #4

10. The Rich Man
Jesus is asked by the Rich Man how to
gain entry to Heaven, but is upset when
he is challenged to sell his belongings
and give the money to the poor.



11. Conversion of St Paul
St Paul is on his way to Damascus
to arrest Christians when he is
blinded and Jesus speak to him
about his persecution. St Paul is
healed by a Christian which leads
to his conversion and mission to
set up churches in the Mediterranean.



12. Peter Walters
Peter Walters is unable to return
home from a holiday which results in
his interaction which the street
children of Colombia. He is urged by
his conscience and the bishop to help
by setting up a charity.



14. Types of Vocation
Priestly vocations are in service of
others, kingly vocations are for
leadership and prophetic vocations
prepare those for the future and
speak the truth.

Keyword #8

13. Parable of the Talents...
The Parable (made up story with a true message) tells
us that three servants were entrusted with different
amounts of money according to their abilities,
and those who used it to make more money
for the master were praised.



15. Active Discernment
We are able to find out our vocation by actively
listening and hearing the voice of God, who will
direct us towards certain decisions.

16. Passive discernment
Is a process of reflection about life choices and
rejection of unchallenging or unrealistic ambitious.
It leads you to Know yourself Respect yourself and
Give yourself

17. CAFOD (Catholic Agency for Overseas Development) is a Catholic charity where lay people live out their vocation to serve those in need, following the example and teaching of Jesus.

18. Purposes of Marriage

A Catholic Marriage is Permanent (life long), Unitive, Raising Family (in faith), Procreative, One flesh, Sacramental and Exclusive.



21. Ordination

Ceremony to become a deacon, priest or Bishop (fullness of priesthood) where they receive objects that symbolise their role, for example the Gospel to preach.

19. Gift of self

The idea that the greatest love we can show is the same sacrificial love that God has for us and works for the benefit of others. Sometimes refers to the attitude of love in a relationship or sexual union.

20. objectification

“viewing someone as a object to be used”, often in a sexual context. It reduces or separates the dignity of a person from their physical appearance, focussing on *what* they are rather than *who* they are

22. Religious life

Some people are called to serve others and God through a “consecrated life” by joining a religious community dedicated to specific vows. This can include lay person, clergy and as a monk or nun.

23. Jeremiah 29:11

“For I know the plans I have for you,” declares the Lord, “plans to prosper you and not to harm you, plans to give you hope and a future”

25. TAKE IT FURTHER...



1. What examples of revelation (the ways God can show himself to us) are there in this topic?
2. Do the sacraments give a vocation or are they a confirmation of a vocation already given?
3. How far do you think our vocation is determined for us?
4. We are called to the same vocation in school to Soli Dei; “*for God alone*” - what could that mean for you personally?
5. Can there be such a thing as a collective or universal vocation?
6. Is vocation the same as inspiration?

24. 1 Corinthians 12:4-6

“There are different kinds of spiritual gifts, but the same Spirit gives them. There are different ways of serving, but the same Lord is served. There are different abilities to perform service, but the same God gives ability to all for their particular service.” - **St Paul**

26. Think About...

How do people respond to a call to a deeper relationship with God?

Is it more important to determine a job or a way of life?

Are all vocations equal?

How do our relationships show vocation?

How do our relationship decisions show the love of God?



You should be aiming for these skills on every assessment page	
Knowledge and understanding skills	S Show <u>Knowledge</u> and <u>understanding</u> of facts/ information/ points of view through detailed explanations and development
	I Influence on actions or belief
	L Lots of <u>Language</u> that is topic specialist and/ or religious in nature
	S Sources of wisdom/ authority
Evaluative skills	P Points of view and alternative reasons
	A <u>Analysis</u> (detailed explanation of features and key points of arguments)
	G Good <u>Judgements</u> made on what the answer to the question is
	E <u>Evaluation</u> of which points are more convincing



REDEPT

RE

9.2 CAFOD- Everybody is Connected Knowledge Organiser



1 NO POVERTY	2 ZERO HUNGER	3 GOOD HEALTH AND WELL-BEING	4 QUALITY EDUCATION	5 GENDER EQUALITY	6 CLEAN WATER AND SANITATION
7 AFFORDABLE AND CLEAN ENERGY	8 DECENT WORK AND ECONOMIC GROWTH	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	10 REDUCED INEQUALITIES	11 SUSTAINABLE CITIES AND COMMUNITIES	12 RESPONSIBLE CONSUMPTION AND PRODUCTION
13 CLIMATE ACTION	14 LIFE BELOW WATER	15 LIFE ON LAND	16 PEACE, JUSTICE AND STRONG INSTITUTIONS	17 PARTNERSHIPS FOR THE GOALS	SUSTAINABLE DEVELOPMENT GOALS

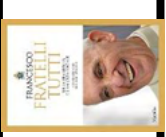
Keyword	Definition
18. CAFOD	Catholic Agency For Overseas Development, a charity that provides aid in poorer countries
19. Catholic Social teaching	Teaching from the Church about how to show love of our neighbour, especially the poor and those in need
20. HIC/ LIC	High Income Country/ Low Income Country. Countries are categorized as one or the other depending on the standard of life there.
21. Fasting	When people limit or stop the amount they eat and drink for a period of time to focus on those in need or their faith
22. Emergency	A man made or natural event that causes destruction and potentially loss of life.
23. Sustainable	Something that can be maintained over the long term
24. Fairtrade	Products that pay the farmers and producers a fair wage
25. Oscar Romero	The Archbishop of El Salvador in 1970's, he defended the poor and oppressed

26. CAFOD mission
Cafod was founded in 1962. They work with local organisations in more than 40 countries, seeking local solutions to end poverty and injustice by providing 'development' not just 'aid'.

27. Evangelii Gaudium
"we must never forget that the planet belongs to all mankind and is meant for all mankind; the mere fact that some people are born in places with fewer resources or less development does not justify the fact that they are living with less dignity."
Pope Francis

28. Parable of Sheep and Goats-
The Parable of the Sheep and Goats strongly encourages Christians to take action to help those in need. In this parable, Jesus makes it clear that a life worthy of the reward of Heaven must involve "feeding the hungry, visiting the sick..."

29. Fratelli Tutti
Fratelli Tutti is a document written by Pope Francis and means "all brothers and sisters". It focuses on modern social and economic problems, and proposes an ideal world in which all countries can be part of a "larger human family".



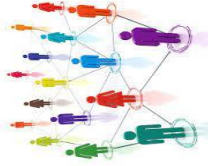
30. Climate Change

The Church teaches that we should have a special care for the poor, as they are most needy and vulnerable. Pope Francis says that caring for the environment also means caring for the poorest, as they will be most affected, & have done least to cause it.



32. Everybody is connected.

Global education enables people to understand the links between their own lives and those of people throughout the world. It increases understanding of the economic, cultural, political and environmental influences which shape our lives.



Catholic Social teaching Principles

33. Dignity- showing respect to others because you see their value

34. The common good- encouraging people to consider how we can help make everyone's lives easier, as we are all equal

35. Care for creation- stewardship and responsibility to treat the world with respect and it's resources with sustainability



36. Laudato Si.

... local problems...demand the active participation of all members of the community... There is a need to respect the rights of peoples and cultures, and to appreciate that the development of a social group...demands the constant and active involvement of local people. Pope Francis

31. Emergencies and Campaigns

Emergency aid is also called humanitarian aid or short term relief work to provide food, clean water and shelter, health care and education. It typically responds to an immediate crisis caused by war or environmental disaster, such as drought, floods or an earthquake.

37. Causes of poverty

Poverty rarely has a single cause. A range of factors including rising living costs, low pay, lack of work, war, greed, poor use of land, natural disasters

Types of poverty

38. Absolute poverty-

This definition describes poverty as not having the essentials for example; food, clothes and shelter.

39. Relative poverty-

This definition describes poverty as not having access to what society thinks citizens should have for example decent quality housing, certain household goods

40. Think about...

Why should we look after the most vulnerable?

Why do some have so much, and others are in such need?

Why should the church have to respond to global poverty?



41. Take it further

Pope Francis uses the term fraternity to describe our attitude to the global community; what does this mean and how does it link to the CST principle of "solidarity"?

How does climate change link to the CST principle of giving an "option to the poor"?

How are the UN and the Church similar?

You should be aiming for these **skills** on every assessment **page**

Knowledge and understanding skills	S	Show Knowledge and understanding of facts/ information/ points of view through detailed explanations and development
	K	
	I	<u>Influence</u> on actions or belief
	L	Lots of <u>Language</u> that is topic specialist and/ or religious in nature
	L	
Evaluative skills	S	<u>Sources</u> of wisdom/ authority
	P	Points of view and alternative reasons
	A	<u>Analysis</u> (detailed explanation of features and key points of arguments)
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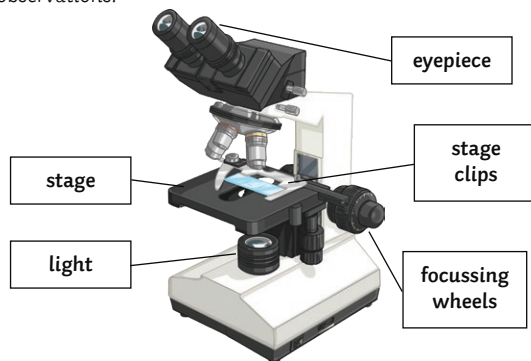
REDEPT

Cell Biology Knowledge Organiser – Foundation and Higher

Required Practical

Microscopy Required Practical

- Includes preparing a slide, using a light microscope, drawing any observations – use a pencil and label important observations.



Osmosis and Potato Practical

- Independent variable – concentration.
- Dependent variable – change in mass.
- Control variable – volume of solution, temperature, time, surface area of the potato.

The potato in the sugar solution will lose water and so will have less mass at the end; the potato in the pure water solution will gain water.



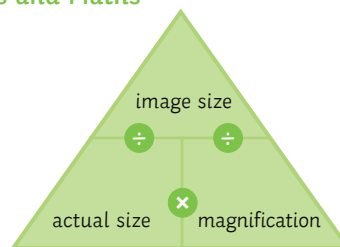
Specialised Cells

When a cell changes to become a specialised cell, it is called differentiation.

Specialised Cell	Function	Adaptation
sperm	To get the male DNA to the female DNA.	Streamlined head, long tail, lots of mitochondria to provide energy.
nerve	To send electrical impulses around the body.	Long to cover more distance. Has branched connections to connect in a network.
muscle	To contract quickly.	Long and contain lots of mitochondria for energy.
root hair	To absorb water from the soil.	A large surface area to absorb more water.
phloem	Transports substances around the plant.	Pores to allow cell sap to flow. Cells are long and joined end-to-end.
xylem	Transports water through the plant.	Hollow in the centre. Tubes are joined end-to-end.

Equations and Maths

Equation



Maths Skills

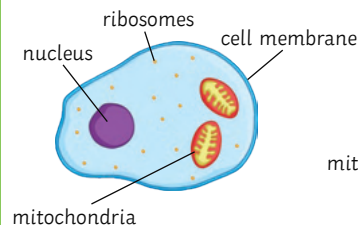
Conversions:
Micrometres to millimetres: divide by 1000.

Standard Form:
 $0.003 = 3 \times 10^{-3}$

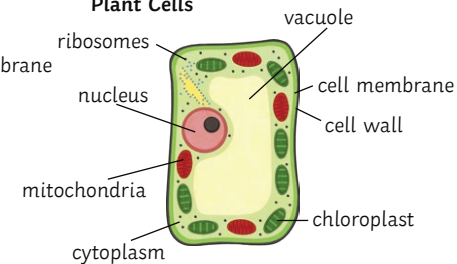
$5.6 \times 10^{-5} = 0.0056$

Prokaryotic and Eukaryotic Cells

Animal Cells



Plant Cells

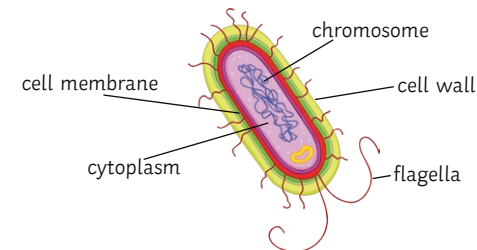


Plant and animal cells have similarities and differences:

	Animal	Plant
nucleus	✓	✓
cytoplasm	✓	✓
chloroplast	✗	✓
cell membrane	✓	✓
permanent vacuole	✗	✓
mitochondria	✓	✓
ribosomes	✓	✓
cell wall	✗	✓

Bacterial Cells

Bacterial cells do not have a true nucleus, they just have a single strand of DNA that floats in the cytoplasm. They contain a plasmid.



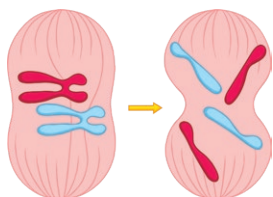
Chromosomes and Mitosis

In the nucleus of a human cell there are 23 pairs of **chromosomes**. Chromosomes contain a double helix of **DNA**. Chromosomes have a large number of genes.



The **cell cycle** makes new cells.

Mitosis: DNA has to be **copied/replicated** before the cell carries out mitosis.



Key Vocabulary

active transport
alveoli
chromosome
diffusion
eukaryotic
gas exchange
mitosis
multicellular
osmosis
prokaryotic
undifferentiated
replicated
specialised
villi

Stem Cells

Embryonic stem cells are **undifferentiated** cells, they have the potential to turn into any kind of cell.



Adult stem cells are found in the bone marrow, they can only turn into some types of cells e.g. blood cells.

Uses of stem cells:

- Replacing faulty blood cells;
- making insulin producing cells;
- making nerve cells.

Some people are against stem cell research.

For Stem Cell Research	Against Stem Cell Research
Curing patients with stem cells - more important than the rights of embryos.	Embryos are human life.
They are just using unwanted embryos from fertility clinics, which would normally be destroyed.	Scientists should find other sources of stem cells.

Stem Cells in Plants

In plants, stem cells are found in the **meristem**. These stem cells are able to produce clones of the plant. They can be used to grow crops with specific features for a farmer, e.g. **disease resistant**.

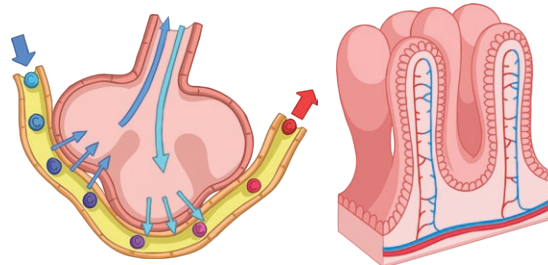
Exchange – Humans

Multicellular organisms have a large surface area to volume ratio so that all the substances can be exchanged.

Gas exchange: Lungs

The alveoli are where gas exchange takes place.

They have a large surface area, moist lining, thin walls and a good blood supply.

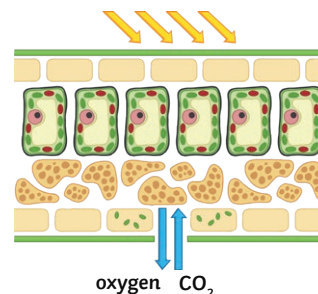


Villi: Small Intestine

Millions of villi line the small intestine increasing the surface area to absorb more digested food.

They are a single layer of cells with a good blood supply.

Exchange in Plants



The surface of the leaf is flattened to increase the surface area for more gas exchange by diffusion.

Oxygen and water vapour diffuse out of the stomata. Guard cells open and close the stomata, controlling water loss.

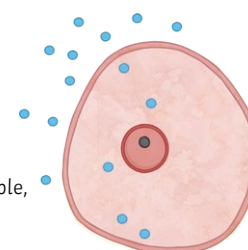
Key Processes

Diffusion is the spreading out of particles from an area of higher concentration to an area of lower concentration.

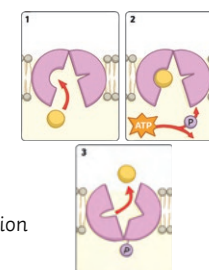
Cell membranes are semi-permeable, only small molecules can get through.

Osmosis is the movement of water molecules across a partially permeable membrane from a region of higher concentration to a region of lower concentration.

Active transport is the movement of substances against the concentration gradient. This process requires energy from respiration.



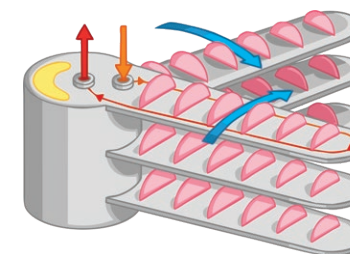
Cell Diffusion



Active Transport in Cells

Exchange in Fish

Fish have a large surface area for gas exchange. These are called **gills**. Water enters the fish through the mouth and goes out through the gills. The oxygen is transported from the water to the blood by **diffusion**. Carbon dioxide diffuses from the blood to the water. Each gill has **gill filaments** which give the gills a large surface area. **Lamellae** cover each gill filament to further increase the surface area for more gas exchange. They have a **thin surface layer** and **capillaries** for good blood supply which helps with diffusion.

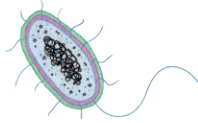


Infection and Response Knowledge Organiser – Foundation and Higher

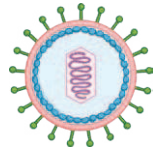
Communicable Disease

Pathogens are **microorganisms** that enter the body and cause communicable disease (infectious). Plants and animals can be infected by them.

Bacteria are small cells that can reproduce very quickly in the body. They produce **toxins** that make you feel ill, damaging your cells and tissues.

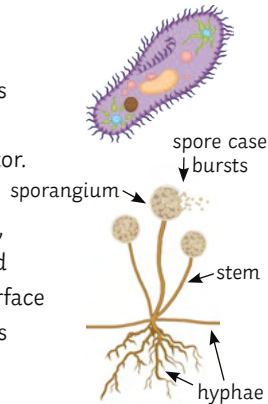


Viruses are much smaller than bacteria; they can also reproduce quickly in the body. Viruses live inside your cell where they replicate. They then burst out of the cell, releasing new viruses.



Protists are eukaryotes (multicellular). Some are parasites which live on or inside other organisms, often carried by a vector.

Fungi are sometimes single celled, others have hyphae that grow and penetrate human skin and the surface of plants. They can produce spores which can spread to other plants.



How Pathogens Are Spread

Pathogens can be spread in many ways, for example:

Water – by drinking dirty water, e.g. cholera.

Air – carried by air and breathed in, e.g. influenza.

Direct contact – touching contaminated surfaces including the skin, e.g. athlete's foot.

Viral Diseases

Measles is spread by droplets of liquid from sneezes and coughs etc., symptoms include a red rash on the skin and a fever. Measles can be serious or even fatal, it can lead to pneumonia. Most people are vaccinated against measles when they are very young.

HIV is spread by sexual contact or exchanging body fluids. HIV can be controlled by antiviral drugs; this stops the viruses replicating. The virus attacks the cells in the immune system. If the immune system is badly damaged, the body cannot cope with other infections. This is the late stage and is called AIDS.

Tobacco mosaic virus affects plants, parts of the leaves become discoloured. This means plants cannot carry out photosynthesis; this will affect the plant's growth.



Fungal and Protist Diseases

Fungal

Rose black spot shows as black spots on the leaves of the plant, this means less photosynthesis occurs. As a result, the plant does not grow as well. It is spread by the wind or the water. They can be treated by using fungicides and taking the leaves off the infected plant.

Protists

Malaria is caused by a protist, mosquitoes are the vectors. They become infected when they feed on an infected animal. The protist is inserted into the blood vessel. Malaria can cause fever, it can also be fatal.

Bacterial Diseases

Salmonella bacteria causes food poisoning. Symptoms include fever, stomach cramps, vomiting and diarrhoea. The symptoms are caused by the toxins produced by the bacteria. Food contaminated with salmonella can give you food poisoning. Most poultry in the UK will have had a vaccination against salmonella.

Gonorrhoea is a sexually transmitted bacterial disease, passed on by sexual contact. Symptoms include pain when urinating and thick yellow/green discharge from the vagina or penis. To prevent the spread, people should be treated with antibiotics and use a condom.

How to prevent the spread:

Being hygienic –

washing hands thoroughly.

Destroying vectors –

killing vectors by using insecticides or destroying their habitat.

Isolation –

isolating an infected person will prevent the spread.

Vaccination –

people cannot develop the infection and then pass it on.



Infection and Response Knowledge Organiser – Foundation and Higher

Fighting Diseases

Defence System

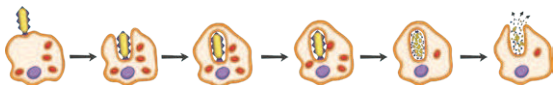
1. The skin acts as a barrier to pathogens.
2. Hairs and mucus in your nose trap particles.
3. The trachea and bronchi secrete mucus to trap pathogens. They also have cilia which move backwards and forwards to transport the mucus towards the throat. This traps any pathogens and the mucus is usually swallowed.
4. The stomach contains hydrochloric acid to kill any pathogens that enter the body via the mouth.

The Immune System

This kills any pathogens that enter the body.

White blood cells:

- **Phagocytosis** is when white blood cells engulf pathogens and then digest them.
- They produce **antitoxins** to neutralise the toxins.
- They also produce **antibodies**. Pathogens have **antigens** on their surface, antibodies produced by the white blood cells lock on to the antigen on the outside of the pathogen. White blood cells can then destroy the pathogens. Antibodies are specific to one antigen and will only work on that pathogen.



Vaccinations

Vaccinations have been developed to protect us from future infections. A vaccination involves an injection of a **dead** or **weakened** version of the pathogen. They carry antigens which cause your body to produce antibodies which will attack the pathogen. If you are infected again, the white blood cells can produce antibodies quickly.



Pros	Cons
Helps to control communicable diseases that used to be very common.	They don't always work.
Epidemics can be prevented.	Some people can have a bad reaction to a vaccine – however, that is very rare.

Fighting Disease – Drugs

Painkillers relieve the pain and symptoms, but do not tackle the cause.



Antibiotics kill the bacteria causing the problem, but do not work on viruses. Viruses are very difficult to kill because they live inside the body cells.



Developing Drugs

There are three main stages in drug testing:

Pre-clinical testing:

1. Drugs are tested on human cells and tissues.
2. Testing carried out on living animals.

Clinical testing:

3. Tested on healthy human volunteers in clinical trials. Starts with a very low dose, then tested on people with the illness to find the optimum dose.

Placebo is a substance that is like the drug, but does not do anything.

Placebo effect is when the patient thinks the treatment will work even though their treatment isn't doing anything.

Blind trial is when the patient does not know whether they are getting the drug or the placebo.

Double-blind trial is when both the doctor and the patient do not know whether they are getting the drug.

Drugs from Plants

Chemicals produced by plants to defend themselves can be used to treat human diseases or help with symptoms.

Drug	Plant/Microorganism
aspirin	willow
digitalis	foxglove
penicillin	mould - penicillium

New drugs are now made by chemists, who work for the pharmaceutical industry, in laboratories.

Key Vocabulary

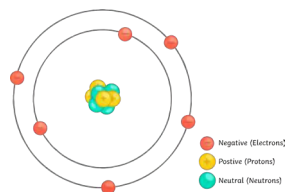
antibodies
antigens
antitoxins
bacteria
blind trial
double-blind
fungus
microorganism
phagocytosis
placebo
protist
toxins
vaccination
vector
virus

Atomic Structure and the Periodic Table – Foundation and Higher

Atoms

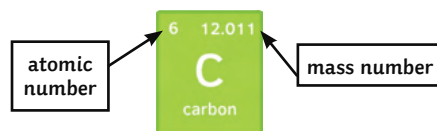
Contained in the nucleus are the **protons** and **neutrons**. Moving around the nucleus are the **electron** shells. They are negatively charged.

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



Equations and Maths

To calculate the **relative atomic mass**, use the following equation:

relative atomic mass (A_r) =

$$\frac{\text{sum of (isotope abundance} \times \text{isotope mass number)}}{\text{sum of abundances of all isotopes}}$$

Balancing Symbol Equations

There must be the same number of atoms on both sides of the equation:



$$\text{C} = 1$$

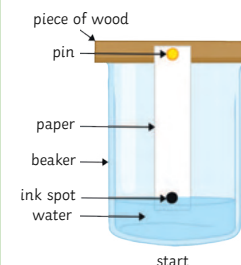
$$\text{O} = 4$$

$$\text{H} = 4$$

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.

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
${}^1_1\text{H}$	1	1	$1 - 1 = 0$
${}^2_1\text{H}$	1	1	$2 - 1 = 1$
${}^3_1\text{H}$	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.

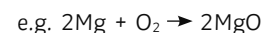
Chemical Equations

A chemical reaction can be shown by using a **word equation**.

e.g. magnesium + oxygen → magnesium oxide

On the left-hand side are the reactants, and the right-hand side are the products.

They can also be shown by a **symbol equation**.



Equations need to be **balanced**, so the same number of atoms are on each side. To do this, numbers are put in front of the compounds.

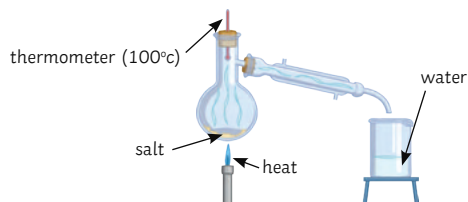


Atomic Structure and the Periodic Table – Foundation and Higher

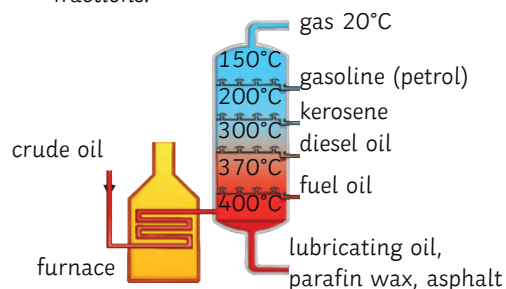
Distillation

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 metallicity.

Non-Metals

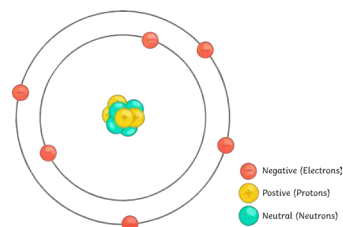
Are dull, brittle, and not always solids at room temperature.

History of the Atom

Scientist	Time	Discovery
John Dalton	start of 19 th century	Atoms were first described as solid spheres.
JJ Thomson	1897	Plum pudding model – the atom is a ball of charge with electrons scattered.
Ernest Rutherford	1909	Alpha scattering experiment – mass concentrated at the centre; the nucleus is charged. Most of the mass is in the nucleus. Most atoms are empty space.
Niels Bohr	around 1911	Electrons are in shells orbiting the nucleus.
James Chadwick	around 1940	Discovered that there are neutrons in the nucleus.

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.



Group 7 Elements and Noble Gases

Halogens

The halogens are **non-metals**: fluorine, chlorine, bromine, iodine. As you go down the group they become less reactive. It is harder to gain an extra electron because its outer shell is further away from the nucleus. The melting and boiling points also become higher.

Noble Gases

The **noble gases** (group 0 elements) include: **helium**, **neon** and **argon**. They are un-reactive as they have full outer shells, which makes them very stable. They are all colourless gases at room temperature.

The boiling points all increase as they go down the group – they have greater intermolecular forces because of the increase in the number of electrons.

Development of the Periodic Table

In the early 1800s, elements were arranged by atomic mass. The periodic table was not complete because some of the elements had not been found. Some elements were put in the wrong group.

Dimitri Mendeleev (1869) left gaps in the periodic table. He put them in order of **atomic mass**. The gaps show that he believed there was some undiscovered elements. He was right! Once found, they fitted in the pattern.

The Modern Periodic Table

Elements are in order of **atomic mass/proton number**. It shows where the metals and non-metals are. **Metals** are on the **left** and **non-metals** on the **right**. The **columns** show the **groups**. The **group number** shows the number of **electrons** in the **outer shell**. The rows are **periods** – each period shows another full shell of electrons.

The periodic table can be used to predict the reactivity of elements.

Alkali Metals

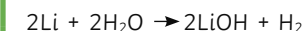
The alkali metals (**group 1** elements) are soft, very reactive metals. They all have **one electron** in their **outer shell**, making them **very reactive**. They are **low density**. As you go down the group, they become more reactive. They get bigger and it is easier to lose an electron that is further away from the nucleus.

They form ionic compounds with non-metals.

They react with water and produce hydrogen.

E.g.

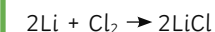
lithium + water → lithium hydroxide + hydrogen



They react with chlorine and produce a metal salt.

E.g.

lithium + chlorine → lithium chloride



They react with oxygen to form metal oxides.

AQA Physics (Combined Science) Unit 6.1: Energy

Required Practical

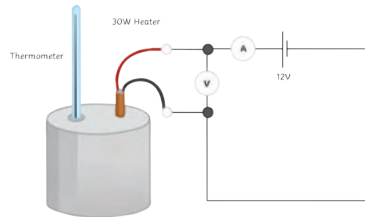
Investigating Specific Heat Capacity

independent variable – material

dependent variable – specific heat capacity

control variables – insulating layer, initial temperature, time taken

$$\Delta E = m \times c \times \Delta\theta$$



Method:

1. Using the balance, measure and record the mass of the copper block in kg.
2. Wrap the insulation around the block.
3. Put the heater into the large hole in the block and the block onto the heatproof mat.
4. Connect the power pack and ammeter in series and the voltmeter across the power pack.
5. Using the pipette, put a drop of water into the small hole.
6. Put the thermometer into the small hole and measure the temperature.
7. Switch the power pack to 12V and turn it on.
8. Read and record the voltmeter and ammeter readings – during the experiment, they shouldn't change.
9. Turn on the stop clock and record the temperature every minute for 10 minutes.
10. Record the results in the table.
11. Calculate work done and plot a line graph of work done against temperature.

Equations

$$E = \frac{1}{2}mv^2$$

$$E_p = mgh$$

$$E_e = \frac{1}{2}ke^2$$

$$\Delta E = m \times c \times \Delta\theta$$

$$P = \frac{E}{t}$$

$$P = \frac{W}{t}$$

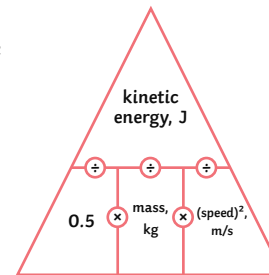
Kinetic and Potential Energy Stores

Movement Energy

$$\text{kinetic energy} = \frac{1}{2} \times \text{mass} \times \text{speed}^2$$

$$E_k = \frac{1}{2}mv^2$$

(J) (kg)(m/s)

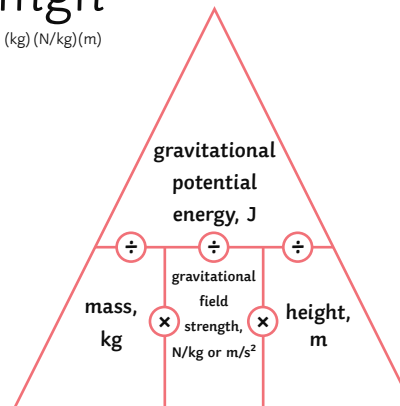


When something is off the ground, it has gravitational potential energy

gravitational potential energy = mass × gravitational field strength × height

$$E_p = mgh$$

(J) (kg) (N/kg)(m)



When an object falls, it loses gravitational potential energy and gains kinetic energy.

Stretching an object will give it elastic potential energy.

elastic potential energy = $\frac{1}{2} \times \text{spring constant} \times \text{extension}^2$

$$E_e = \frac{1}{2}ke^2$$

(J) (N)(m)

Transferring Energy by Heating

Heating a material transfers the energy to its thermal energy store - the temperature increases.

E.g. a kettle: energy is transferred to the thermal energy store of the kettle. Energy is then transferred by heating to the water's thermal energy store. The temperature of the water will then increase.

Some materials need more energy to increase their temperature than others.

change in thermal energy = mass × specific heat capacity × temperature change

$$\Delta E = m \times c \times \Delta\theta$$

(J) (kg) (J/kg°C) (°C)

Specific heat capacity is the amount of energy needed to raise the temperature of 1kg of a material by 1°C.

Energy Stores and Systems

Energy Stores	
kinetic	Moving objects have kinetic energy.
thermal	All objects have thermal energy.
chemical	Anything that can release energy during a chemical reaction.
elastic potential	Things that are stretched.
gravitational potential	Anything that is raised.
electrostatic	Charges that attract or repel.
magnetic	Magnets that attract or repel.
nuclear	The nucleus of an atom releases energy.

Energy can be transferred in the following ways:

mechanically – when work is done;

electrically – when moving charge does work;

heating – when energy is transferred from a hotter object to a colder object.

Conservation of Energy

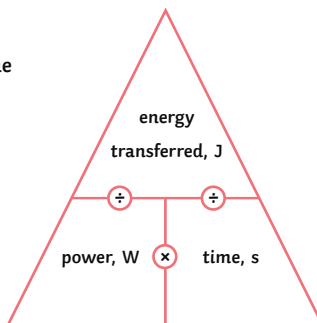
Energy can never be created or destroyed, just transferred from one form to another. Some energy is transferred usefully and some energy gets transferred into the environment. This is mostly wasted energy.

Power

Power is the rate of transfer of energy – the amount of work done in a given time.

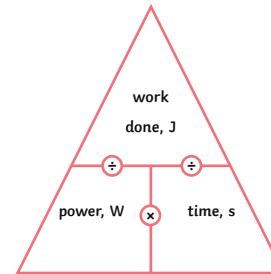
$$\text{power} = \text{energy transferred} \div \text{time}$$

$$P (W) = E (J) \div t (s)$$



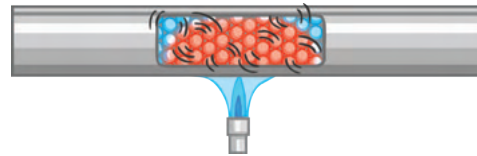
$$\text{power} = \text{work done} \div \text{time}$$

$$P (W) = W (J) \div t (s)$$



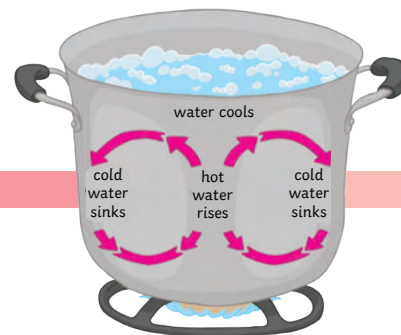
Energy Transfer

Lubrication reduces the amount of friction. When an object moves, there are frictional forces acting. Some energy is lost into the environment. Lubricants, such as oil, can be used to reduce the friction between the surfaces.



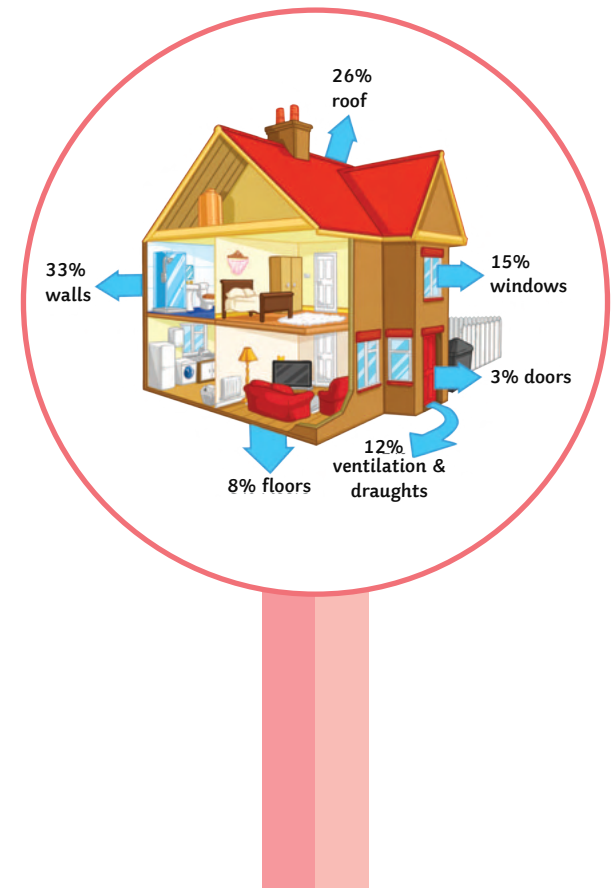
Conduction – when a solid is heated, the particles vibrate and collide more, and the energy is transferred.

Convection – when a liquid or a gas is heated, the particles move faster. This means the liquid or gas becomes less dense. The denser region will rise above the cooler region. This is a convection current.



Insulation – reduces the amount of heat lost. In your home, you can prevent heat loss in a number of ways:

- thick walls;
- thermal insulation, such as:
- loft insulation (reducing convection);
- cavity walls (reduces conduction and convection);
- double glazing (reduces conduction).

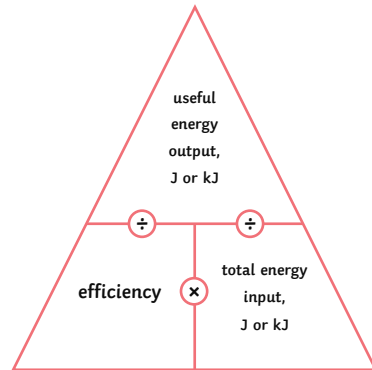


Efficiency

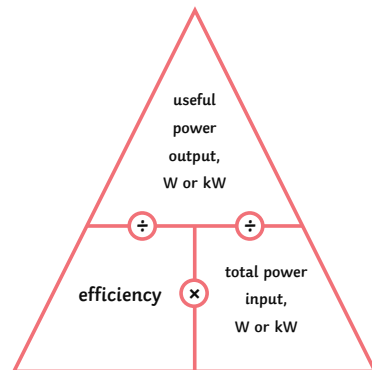
When energy is transferred, some energy is wasted. The less energy that is wasted during the transfer, the more efficient the transfer.

There are two equations to calculate efficiency:

$$\text{efficiency} = \frac{\text{useful output energy transfer}}{\text{total input energy transfer}}$$



$$\text{efficiency} = \frac{\text{useful power output}}{\text{total power input}}$$



Some energy is always wasted. Nothing is 100% efficient.

Efficiency

Non-renewable – coal, oil, gas - they will all run out, they damage the environment, but provide most of the energy.

Renewable – they will never run out, can be unreliable and do not provide as much energy.

Energy Resource	Advantages	Disadvantages
solar – using sunlight	Renewable, no pollution, in sunny countries it is very reliable.	Lots of energy needed to build, only works during the day, cannot increase power if needed.
geothermal – using the energy of hot rocks	Renewable and reliable as the rocks are always hot. Power stations have a small impact on environment.	May release some greenhouse gases and only found in specific places.
wind – using turbines	Renewable, no pollution, no lasting damage to the environment, minimal running cost.	Not as reliable, do not work when there is no wind, cannot increase supply if needed.
hydroelectric – uses a dam	Renewable, no pollution, can increase supply if needed.	A big impact on the environment. Animals and plants may lose their habitats.
wave power – wave powered turbines	Renewable, no pollution.	Disturbs the seabed and habitats of animals. Unreliable.
tidal barrages – big dams across rivers	Renewable, very reliable, no pollution.	Changes the habitats of wildlife, fish can be killed in the turbines.
biofuels	Renewable, reliable, carbon neutral.	High costs, growing biofuels may cause a problem with regards to space, clearance of natural forests.
non-renewable – fossil fuels	Reliable, enough to meet current demand, can produce more energy when there is more demand.	Running out, release CO ₂ , leading to global warming, and also release SO ₂ which causes acid rain.

Trends in energy resources – most of our electricity is generated by burning fossil fuels and nuclear. The UK is trying to increase the amount of renewable energy resources. The governments are aware that non-renewable energy resources are running out; targets of renewable resources have been set. Electric and hybrid cars are also now on the market.

However, changing the fuels we use and building renewable power plants cost money. Many people are against the building of the plants near them and do not want to pay the extra in their energy bills. Hybrid and electric cars are also quite expensive.