



Be Kind.

Work Hard.



Take
Responsibility.

Need To Know Book

Year 9

2024/2025

Name: _____

Form Group: _____

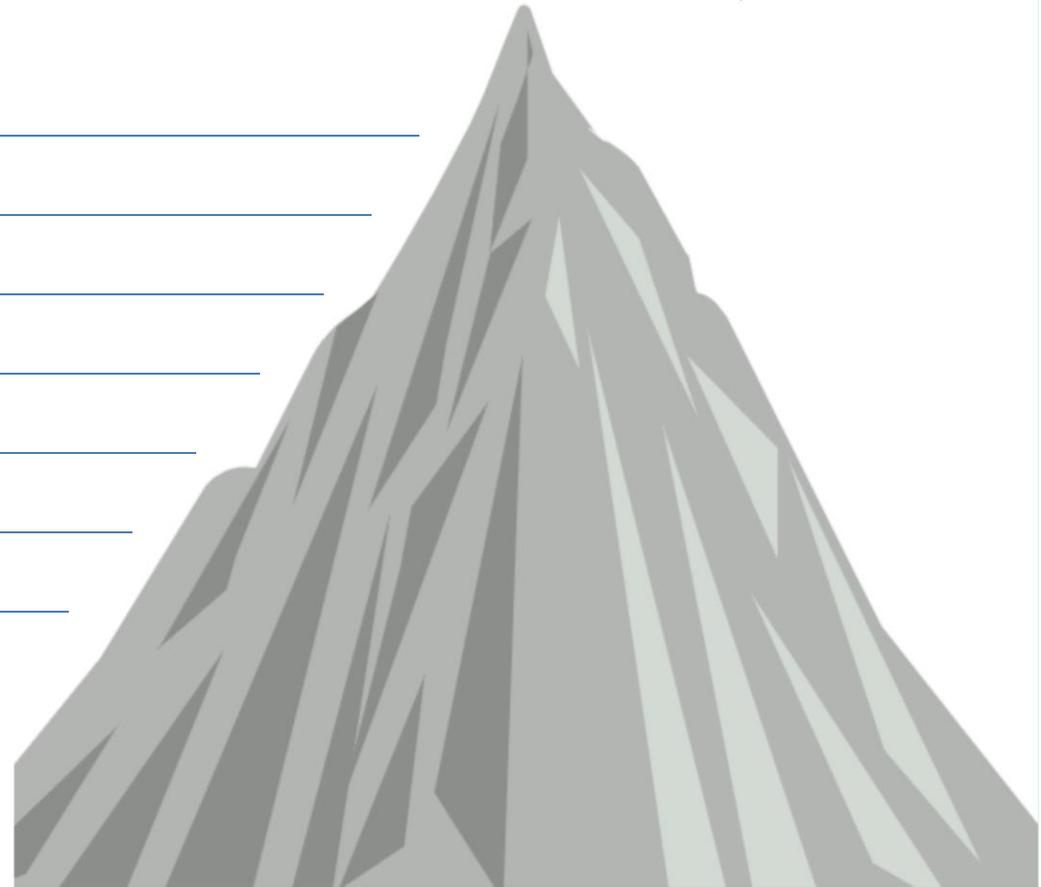


My Aspirational Sentence.

Little Lever School

be kind | work hard | take responsibility

What does the top of my mountain look like?



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Knowledge Retrieval Sheet

What are knowledge retrieval sheets?

Here at Little Lever School, we think it is really important that you know what the essential knowledge is for each subject that you study. Learning takes place not only in the classroom, but in all areas of the school building, and at home. These [knowledge retrieval sheets](#) contain all the essential knowledge you will need to help revise and make progress towards achieving your best in all of your subjects.

Work Hard.



Take Responsibility.

By using your [knowledge retrieval sheets](#) each week you will be able to transfer your knowledge from your short-term memory, and make it stick. Within all your lessons, you will be asked to retrieve knowledge from your long-term memory. This might be in the form of quizzes or longer responses. These might require you to use lots of information you have already stored from previous lessons and from your own life experiences. These [Need to Know Books](#) will help you to check how much you can remember.

We have designed your [knowledge retrieval sheets](#) so that they are simple for you to use both in school and at home. You can even get others to help you. Below are some options for how you might use each sheet to make the knowledge stick in your brain so that you will be able to remember it.

Using Knowledge Retrieval Sheets- 5 Top Tips:

1

'Look, Cover, Say, Write, Check'- Look at a fact on your sheet, cover it up with your hand or a piece of paper. Say it out loud, write the fact down without checking and then uncover and check if you were correct.

2

'If this is the answer, what is the question?'- Quiz yourself by covering up facts on your sheet. For example, you could cover up the definition of key vocabulary and try to remember what the key vocabulary means.

3

Independent low-stakes quizzing- Use the questions on the back of each sheet to test yourself. You should write the answers on a separate sheet of paper so that you can use the question sheet again in future.

4

Paired low-stakes quizzing- Give your book or a sheet to someone else. (Could be a friend, teacher or family). They can ask you the questions on the back of any sheet and use the facts on the front to check if you are correct.

5

Flashcard Revision- Make flashcards using your knowledge sheets. Can you summarise the essential knowledge into your own words to put onto a pocket-sized revision card?



Art



Helping every person achieve things they never thought they could.

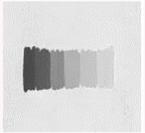
Year 9 Art: The Formal Elements

The Formal Elements of Art



Line

A **line** is an identifiable path created by a point moving in **space**. It is one-dimensional and can vary in width, direction, and length. **Lines** can be horizontal, vertical, or diagonal, straight or curved, thick or thin.



Tone

Tone refers to the relative lightness or darkness of a colour. One colour can have an almost infinite number of different **tones**.



Colour

Made up of three properties: hue, value, and intensity. Red, yellow and blue are primary colours, which means they can't be mixed using any other colours. Two primary colours mixed make a secondary colour. A primary and a secondary colour mixed make a tertiary colour



Shape

A shape is an area enclosed by a line. It could be just an outline or it could be shaded in. Shapes can be either geometric, like a circle, square or triangle, or irregular.



Texture

Texture refers to the surface quality in a work of **art**. We associate **textures** with the way that things look or feel.



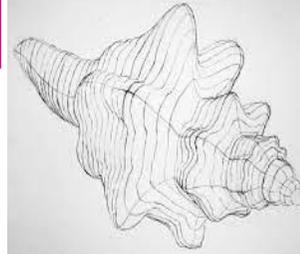
Pattern

Pattern is created by repeating lines, shapes, tones or colours. The design used to create a pattern is often referred to as a motif. Motifs can be simple shapes or complex arrangements.



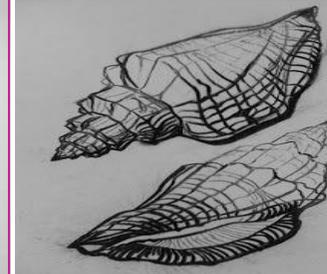
Form

Form is a three-dimensional shape, such as a cube, sphere or cone. Sculpture and 3D design are about creating forms.



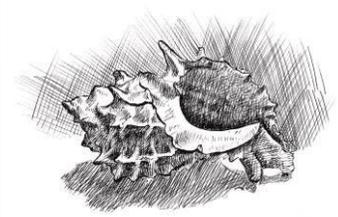
Contour Lines

Lines that are used to define the shape or form of an object or to show key details are called outlines or contour lines.



Descriptive Lines

Descriptive lines tell us more about a subject. They help make a shape look more like a three-dimensional object by showing light, shade and texture.



Expressive Lines

The way lines are created can be used to express emotions and to create mood.

Jason Scarpace

Jason Scarpace was born in 1972 in New York and is best known for his abstract fish art.

Scarpace's fish paintings are created in acrylic, oil, watercolour, pastel and a variety of other media on canvas, board and paper.

Widely regarded as colourful, completely original, and whimsical, the works of Jason Scarpace represent in his own words, "a personal journey through the use of basic art elements: line, shape and colour."



Year 9 Art: The Formal Elements

The Formal Elements of Art

What do you know about **line**?

What do you know about **tone**?

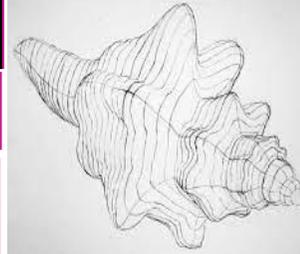
What do you know about **colour**?

What do you know about **shape**?

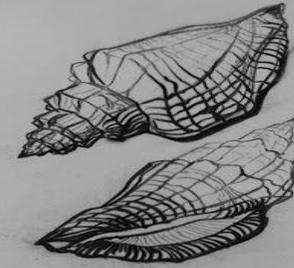
What do you know about **texture**?

What do you know about **pattern**?

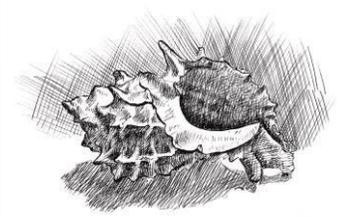
What do you know about **form**?



What are contour lines?



What are descriptive lines?



What are expressive lines?

Jason Scarpace

Jason Scarpace was born in:

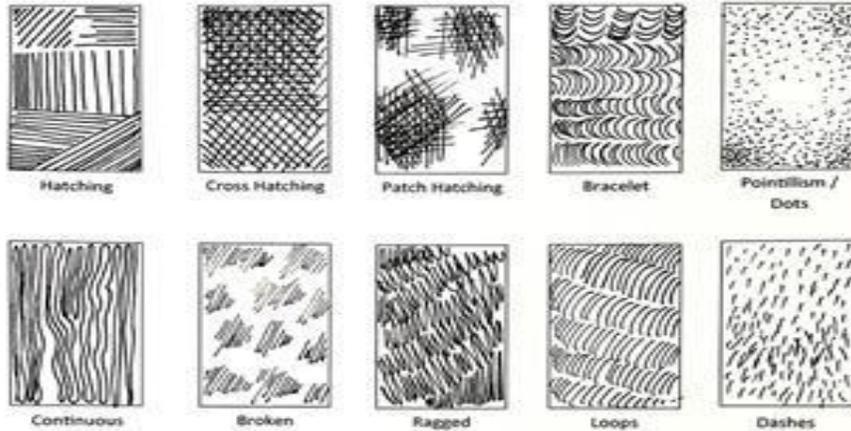
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Widely regarded as colourful, completely original, and whimsical, the works of Jason Scarpace represent in his own words...



Year 9 Art: The Formal Elements

Natural Forms



Natural form is an object in nature in its original form.

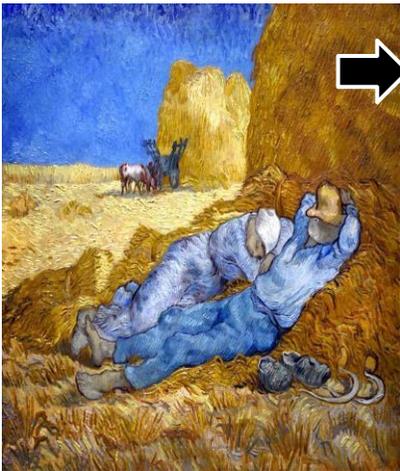
For example: leaves, flowers, pinecones, seaweed, shells, bones, insects, stones, fossils, crystals, feathers, birds, fish, animals – in fact, anything you can find in nature – complete or part of it.



Mark Making

Mark making describes the different lines, dots, marks, patterns, and textures we create in an artwork. It can be loose and gestural or controlled and neat.

It can apply to any material used on any surface: paint on canvas, ink or pencil on paper, a scratched mark on plaster, a digital paint tool on a screen... Artists can also use mark-making to express feelings and emotions.



Implied Texture

Rather than accurately copying the appearance of their subject, many artists use texture to show their technique and to express emotion. Vincent Van Gogh created many heavily textured artworks. using thick application of oil paint in an expressive manner.

This creates an artwork that has a rough texture as well as a raised surface. Applying thick areas of paint on a canvas like this is known as impasto. This layered, thick paint creates a visual effect that allows you to see the individual brushstrokes the artist has used.

Actual Texture

Actual texture, or physical texture, means the actual physical surface of an artwork or design. It describes the tactile feeling you would get if you were able to run your hand over an artwork.

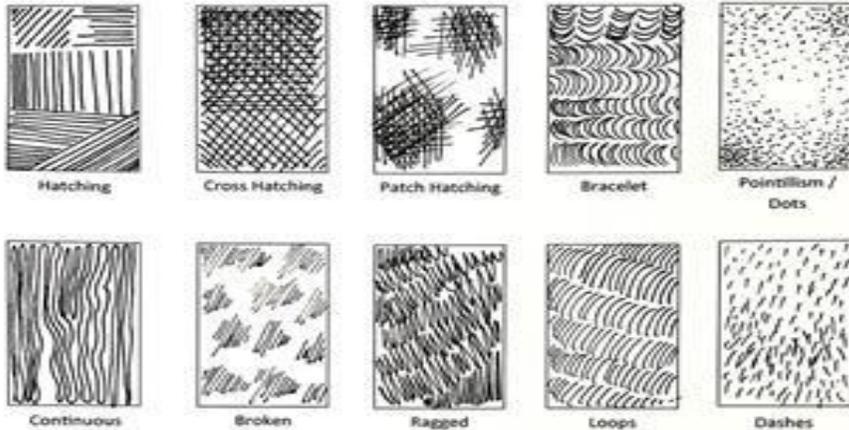
This feeling can vary depending on the materials the artist used to create the piece of work. It could be smooth, bumpy, coarse, rough or many other textures.

Actual texture is the result of the materials used and the artist or designer's technique.



Year 9 Art: The Formal Elements

Natural Forms



Natural form is _____
_____.

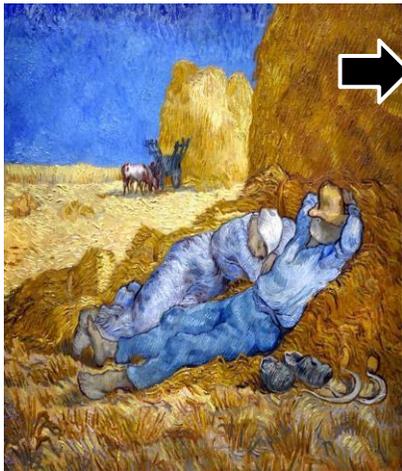
For example: leaves, flowers, pinecones, seaweed, shells, bones, insects, stones, fossils, crystals, feathers, birds, fish, animals – in fact, anything you can find in nature – complete or part of it.



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_____.

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Actual texture is the result of the _____
_____.



Georgia O'Keeffe

The American artist Georgia O'Keeffe is best known for her close-up, or large-scale flower paintings, which she painted from the mid-1920s through the 1950s. O'Keeffe experimented with depicting flowers in her high school art class. Her teacher explained how important it was to examine the flower before drawing it. So, O'Keeffe held it in different ways, capturing different perspectives of the flowers, and also created studies of only a portion of the flower. During this process she also drew the flower simpler with each iteration. This process is also known as abstraction.



Watercolour Techniques

Wet on wet

Applying fresh paint on to a wet surface or on to paint that is still wet. Dampen your paper with water before adding paint.



Dry brush

Painting with a dry brush. Make sure your paint is not too wet and dab the excess on a paper towel for the best effect.



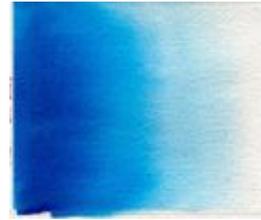
Flat wash

One of the simplest techniques. Simply paint a large, even patch of one colour to create a base.



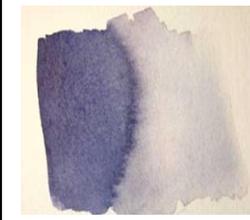
Gradated

Start by loading the brush with lots of colour. Each time use a little less colour so that the colour fades and creates a smooth gradient.



Hard/soft edge

A hard edge is an edge with a distinct line separating it from the background. A soft edge is one that blends out gradually.



Georgia O'Keeffe



Watercolour Techniques

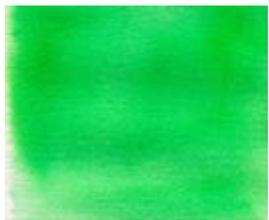
Wet on wet



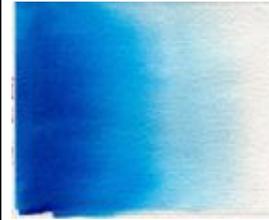
Dry brush



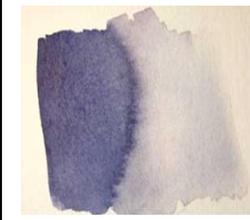
Flat wash



Graded



Hard/soft edge



Catering



Helping every person achieve things they never thought they could.

Year 9 Catering

What are seasonal foods?

Fruit and vegetables naturally grow in cycles, and ripen during a certain season each year. When they are in season they are harvested.

We mostly think of fruit and vegetables as seasonal however, some fish and meat can also be seasonal.

Advantages to using seasonal foods:

- Food is very fresh
- Food has the best flavour, texture and colour
- Nutrients have not been lost over time
- Food is cheaper than importing from other countries
- More support for local producers
- Food travels less distance

Disadvantages of using seasonal foods:

- Less choice at different times of the year
- Favourite products are not always available
- Reduced trade to other countries

What are Food Miles?

Food miles are a way of attempting to measure how far food has travelled before it reaches the consumer.

It is a good way of looking at the environmental impact of foods and their ingredients.

It includes getting foods to you, but also getting waste foods away from you, and to the landfill!



Fairtrade:

Ensuring that farmers in less economically developed countries get a fair deal;

Local foods:

Buying locally supports local business and farmers and some believe that food produced locally is more sustainable;

Genetically modified (GM) food:

Scientific intervention is used to change a plant, animal or micro-organism's genes or to insert one gene from another organism

Effects of Heat on Food

- Proteins **coagulate** – they 'set' and become firm e.g. an egg setting when fried
- Starches **gelatinise**- this helps to thicken foods e.g. flour in a cheese sauce
- Sugars **caramelize** – they become sweet and brown e.g. sugar melted on the top of a crème brûlée
- Water **evaporates** – this explains why foods become dry when they cook e.g. bread toasted
- Fats **melt** – e.g. the fat that comes out of sausages when you grill them
- Surfaces **brown** – e.g. the surface of a piece of meat or the crust of a loaf of bread

To sauté a dish means to cook it in a small amount of fat over high heat, making sure that the food doesn't stick to the pan.

To simmer means to cook something liquid, or something with liquid in it, at a temperature slightly below boiling

To boil is the cooking of food by immersion in water that has been heated to near its boiling point

To reduce a liquid means to simmer it until some of the water in it has evaporated, which intensifies the flavours and thickens the liquid

Why do we cook food?

- To make it nicer to eat e.g. add flavour, improve texture, enhance colour
- To make it safe to eat by destroying food poisoning bacteria
- To destroy bacteria which cause food spoil (go off)
- To make food easier to digest



Year 9 Catering

What are seasonal foods?

What are the advantages to using seasonal foods?

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What are the disadvantages of using seasonal foods?

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What are Food Miles?



What is Fairtrade?

What are local foods and what are the benefits?

What is genetically modified (GM) food?

What are the different effects of heat on food?

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To sauté a dish means to cook it in a...

To simmer means

To boil is the cooking of food by...

To reduce a liquid means to

Why do we cook food?

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Year 9 Catering

Convection

Convection is used in many situations, for example boiling eggs in a pan.

The water molecules closest to the bottom of the pan will gain kinetic (movement) energy and spread out.

This area of water will become less dense and rise.

Cooler water at the top of the pan moves down to take its place.

This causes a convection current, the boiled water circulates around the food, cooking it.

Radiation

All warm objects give off infra-red radiation that travels as waves.

Food that is cooked by grilling or toasting is cooked by radiation.

The infra-red radiation which is absorbed by the food increasing its temperature.

Conduction

During conduction heat energy is passed to the food from the heat source by **direct contact** e.g. frying bacon.

Heat energy is transferred from the hob to the outside of the pan and pass on this energy to any other molecules they are in contact with.

Food that comes into contact with the inside of the pan will also gain this energy.

Microwaves

Microwaves use a different type radiation to cook food. The radiation is high-energy radio waves given the name microwaves.

The microwaves penetrate the food and are absorbed by the water in the food, causing the molecules to vibrate, increasing its temperature.

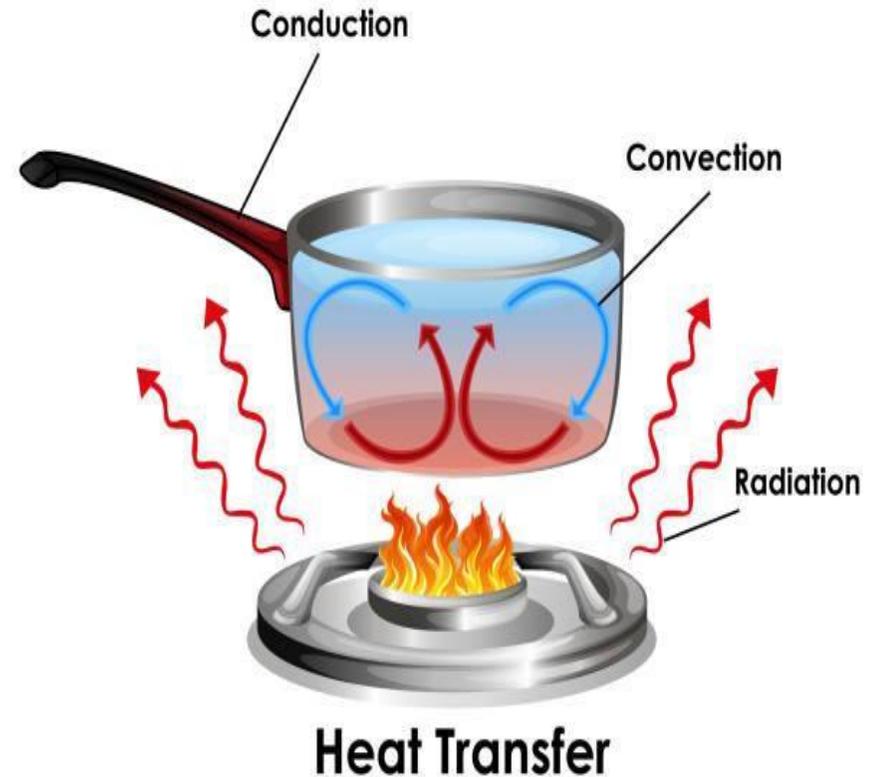
This heat energy cooks the food.

Food preservation

Known “as the science which deals with the process of prevention of decay or spoilage of food thus allowing it to be stored in a fit condition for future use”.

Convenience foods

A food, typically a complete meal, that has been pre-prepared commercially and so requires minimum further preparation by the consumer



Year 9 Catering

What is convection?

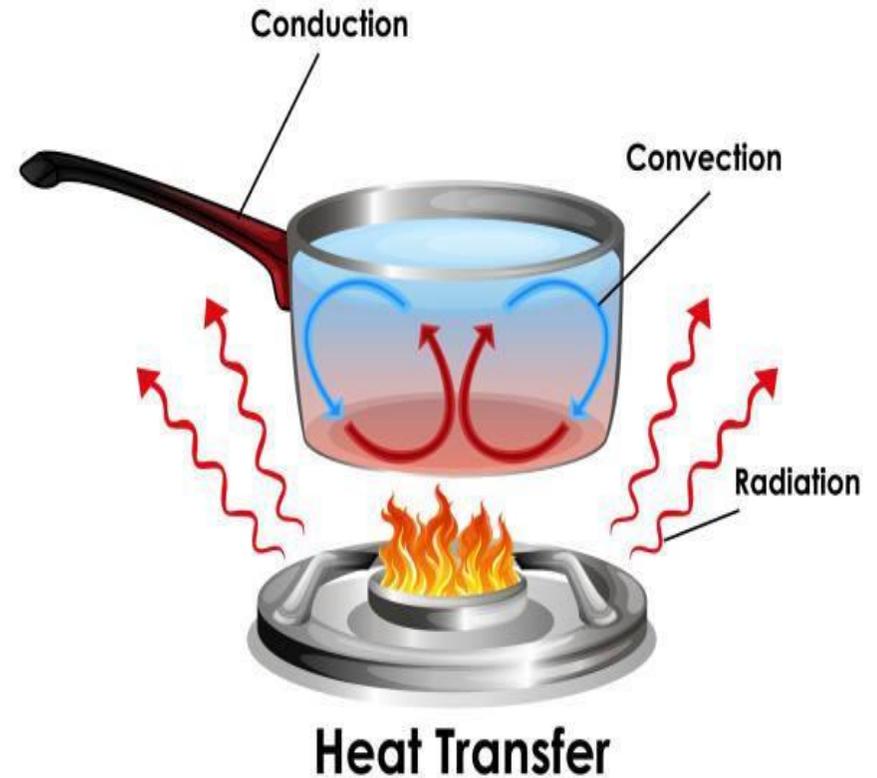
What is conduction?

What is radiation?

What are microwaves?

What is food preservation?

What are convenience foods?



Computing



Helping every person achieve things they never thought they could.

Year 9 Computing: Cybersecurity

You and Your Data

Data is raw facts and figures. E.g.: John: 28, Claire: 49

Information is created when that data has been processed and becomes meaningful: John needs to resit the test.

The following **personal data** may be collected about you: Name, date of birth, address

All organisations and people using and storing personal data must abide by the following **Data Protection Act** principles.

Data must be:



Social Engineering

- **Social engineering** is a set of methods used by cybercriminals to deceive individuals into handing over information that they can use for fraudulent purposes.
- **Phishing** - A phishing attack is an attack in which the victim receives an email disguised to look as if it has come from a reputable source, in order to trick them into giving up valuable data.
- **Blagging** - Blagging (also known as pretexting) is an attack in which the attacker invents a scenario in order to convince the victim to give them data or money.
- **Name generator attacks** - These are attacks in which the victim is asked in an app or a social media post to combine a few pieces of information or complete a short quiz to produce a name. Attackers do this to find out key pieces of information that can help them to answer the security questions that protect people's other accounts.
- **Shouldering** - Shouldering (also known as shoulder surfing) is an attack designed to steal a victim's password or other sensitive data. It involves the attacker watching the victim while they provide sensitive information, for example, over their shoulder.



What is 'hacking'? Gaining unauthorised access to or control of a computer system.

Why might people want to hack?

- To steal data
- To disrupt services
- For financial gain
- For political reasons (espionage and activism)
- For fun (planting the flag)
- For ethical reasons

What are 'penetration testers'?

People who are paid to legally hack into computer systems with the sole purpose of helping a company identify weaknesses in their system.

What is the difference between a 'denial of service DoS' attack and a 'distributed denial of service DDoS' attack?

A DoS is a cyberattack in which the criminal makes a network resource unavailable to its intended users. This is done by flooding the targeted machine or website with lots of requests in an attempt to overload the system. A DDoS is the same as DoS attack, only this time multiple computers are making attacks at the same time.

What is a 'brute force' attack?

This is a form of attack that makes multiple attempts to discover something (such as a password).

Year 9 Computing: Cybersecurity

You and Your Data

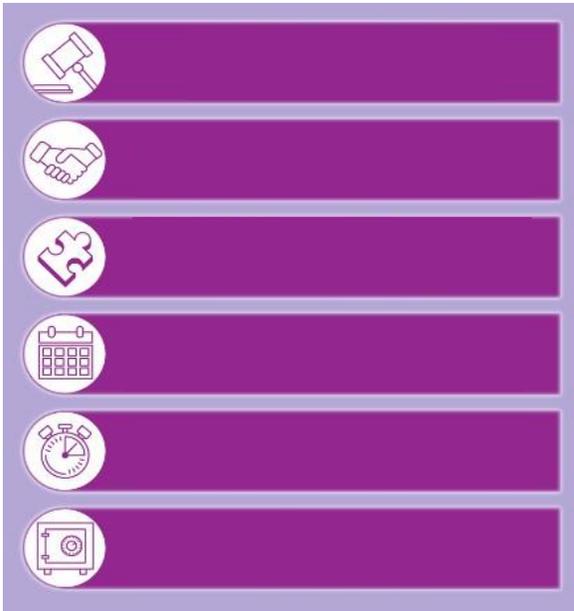
Data is

Information is

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Social Engineering

• Social engineering is

• Phishing -

• Blagging -

• Name generator attacks -

• Shouldering -



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Why might people want to hack?

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What are 'penetration testers'?

What is the difference between a 'denial of service DoS' attack and a 'distributed denial of service DDoS' attack?

What is a 'brute force' attack?

Year 9 Computing: Cybersecurity

What is Malware?

What is a virus?

What is a 'worm'?

What is a 'Trojan'?

Methods to protect networks from cyber attacks:

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Keyword	Definition	Context/Key Term
Viruses		Can cause many problems for the user e.g. slowing their computer down.
Worm	Self-replicating malware spreading across networks.	
Trojan	Malware disguised as legitimate software.	
Spyware		
Ransomware		
Adware		
Internet Bots	Automated programs performing tasks on the internet.	
Malware		Poses a threat to computer systems.



Year 9 Computing: Cybersecurity prevention methods

Computer Misuse Act:

This law covers an individual's use of computers.

It covers:

- Unauthorised access to computer material
- Unauthorised access with intent to commit or facilitate the commission of further offences
- Unauthorised acts with intent to impair, or with recklessness as to impairing, the operation of a computer

Firewall

A firewall checks incoming and outgoing network traffic. It scans the data to make sure it doesn't contain anything malicious and that it follows the rules set by the network.

Anti-Malware

Anti-malware is software that scans any file that is able to execute code. If anti-malware spots anything suspicious in the code, the files are quarantined.



Auto Updates

Auto-updates refers to software that automatically checks for available updates for the software you have on your computer. Once it finds an update, the software can be set either to alert the user or to install it automatically.

User Authentication

Only authorised users identified with the correct username and password will be allowed access. Different users will have access to different parts of the network.

Two factor Authentication

User authentication that provides an extra layer of security of online accounts. In addition to a username and password, a one time passcode or a PIN number may be sent to the user to input.



Captcha

A type of user authentication that proves the user is a real person, not a computer.

Match the characters in the picture [Help](#)

To continue, type the characters you see in the picture. [Why?](#)

V6T9IBCDS

The picture contains 8 characters.

Characters:

[Continue](#)

Year 9 Computing: Cybersecurity prevention methods

Computer Misuse Act:

It covers:

-
-
-

Firewall

Anti-Malware



Auto Updates

User Authentication

Two factor Authentication



Captcha

Match the characters in the picture [Help](#)

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Characters:

Year 9 Computing: Introduction to Python

Getting started with Python

We use an IDE to write our code in Python, there are lots of different types available, the main ones you will use are **Thonny** and **Replit**. Thonny is installed on the computers, Replit is online.

Key Term	Description	Example
Print function	Used to <i>display</i> text on the screen.	<code>print("Hello World")</code>
Escape sequences	<i>Special characters</i> that are used to control the <i>formatting</i> of text that is printed by the print function. E.g <code>\n</code> causes the print function to print a <i>newline character</i>	<code>print("Hello, \n World")</code>
Data types	Are used to <i>store and organise</i> data in Python. When we use numbers in python we use integers and floats .	<code>age = int(input("What is your age?"))</code> <code>temp = float(input("What is today's temperature?"))</code>
Integers	A data type that stores whole numbers i.e. 1,2,3, 10, 100, 1000	If a number used isn't whole then an error will be displayed
Floats	A data type that stores numbers that have decimal points i.e. 3.14	If a number used does not have a decimal place an error will be displayed
Variable	Is a place in memory where you can <i>store</i> a value. You can use variables to store numbers (and other data types).	<code>My_number = 5</code>

What is Python?

Python is a *high-level*, general-purpose programming language; this means that it is written in a way that looks a lot like English so can be read by lots of people, and it is a great choice for solving lots of different problems.

Programming Key Words

Abstraction	Identify the important aspects to start with
Algorithm	Precise sequence of instructions
Computational thinking	Solving problems with or without a computer
Debugging	Looking at where a program might have errors or can be improved
Decomposition	Breaking down a problem into smaller parts
Execute	A computer precisely runs through the instructions
Iteration	Doing the same thing more than once
Selection	Making choices
Sequence	Running instructions in order
Syntax errors	Syntax errors occur when the rules of the programming language are not followed, e.g. a command word is misspelled
Logic errors	Occur when there is a flaw in the design of a program, which does not prevent it from running but it causes it to produce an incorrect or unexpected result.
Run-time errors	Occur during program execution when the processor is asked to perform an impossible operation, e.g. to divide by zero, or open a non-existent file.

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Floats	A data type that stores numbers that have decimal points i.e. 3.14	
Variable		<code>My_number = 5</code>

What is Python?

Programming Key Words	
Abstraction	
Algorithm	
Computational thinking	
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Execute	
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Logic errors	
Run-time errors	

Year 9 Computing: Data Types and Variables

Data types

Data Type	Description	Example	Advantages and disadvantages
Integers	Whole numbers, such as 1, 2, 3, etc.	5	Efficient for whole numbers, cannot store decimal points.
Floats	Numbers with decimal points, e.g., 3.14, 2.718	3.14	More flexible than integers but take up more memory.
Strings	Text, such as "Hello, world!"	"Hello, world!"	Useful for text but can be difficult to work with if very long.
Booleans	True or false values	True	Simple to use but cannot store much information.
Lists	Ordered collections of data	[1, 2, 3]	Useful for ordered collections but may be slow if very large.
Dictionaries	Unordered collections of data	{"name": "John", "age": 30}	Useful for unordered collections but can be complex to work with.

Data Type Considerations:

When choosing a data type, consider the type of data and usage. For instance:

- Use a list for storing a list of numbers.
- Use a dictionary for storing a name and age.

Operators

Operators are used to perform *mathematical* and *logical operations* on *values* in Python. There are many different types of operators in Python, but we will focus mainly on **arithmetic operators, comparison operators, and logical operators.**

Category	Operators	Example
Arithmetic Operators	Addition (+) Subtraction (-) Multiplication (*) Division (/)	5 + 5 = 10 10 - 5 = 5 2 * 2 = 4 5 / 2 = 2.5
Comparison Operators	Greater Than (>) Less Than (<) Equal To (==) Not Equal To (!=)	5 > 3 5 < 7 5 == 5 5 != 6
Logical Operators	And (and) Or (or) Not (not)	5 and 5 5 or 6 not 5



Year 9 Computing: Data Types and Variables

Data types

Data Type	Description	Example	Advantages and disadvantages
Integers		5	
Floats			
Strings			
Booleans			
Lists			
Dictionaries	Unordered collections of data		Useful for unordered collections but can be complex to work with.

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Category	Operators	Example
Arithmetic Operators	Addition (+) Subtraction (-) Multiplication (*) Division (/)	
Comparison Operators		
Logical Operators	And (and) Or (or) Not (not)	



Year 9 Computing: Loops and Statements

Loops

A loop is a *programming construct* that allows you to repeat a block of code a specified number of times. In Python, there are three types of loops: **for loops**, **while loops**, and **nested loops**.

For loops are used to **iterate** over a sequence of items, such as a list or a range of numbers. The *syntax* for a for loop is as follows:

```
for <variable> in <sequence>:  
    <block of code>
```

The variable <variable> will be assigned each item in the sequence <sequence>, one at a time. The block of code will be executed for each item in the sequence. For example, the following code will print the numbers from 1 to 10:

```
for i in range(1, 11):  
    print(i)
```

While loops are used to repeat a block of code as long as a condition is true. The syntax for a while loop is as follows:

```
while <condition>:  
    <block of code>
```

The block of code will be executed as long as the condition is true. For example, the following code will print the numbers from 1 to 10, but it will only print the numbers that are divisible by 2:

```
i = 1  
while i <= 10:  
    if i % 2 == 0:  
        print(i)  
    i += 1
```

This code will print the following to the screen:

```
2  
4  
6  
8
```

Nested loops are loops that are inside of other loops.

Statements

Statements are instructions that tell the computer what to do. They are the building blocks of Python programs. There are many different types of statements in Python, but some of the most common are:

Category	Description	Example
Assignment Statements	Assign values to variables.	Example: <code>x = 5</code> assigns the value 5 to the variable <code>x</code> .
Expression Statements	Evaluate expressions and return a value.	Example: <code>5 + 5</code> evaluates the expression <code>5 + 5</code> and returns the value 10.
Control Flow Statements	Control the flow of execution in a program.	Example: <code>if x > 5:</code> will only be executed if the value of <code>x</code> is greater than 5.
Function Statements	Define functions, which are reusable blocks of code. Functions can be called from anywhere in a program.	<code>def my_function():</code>

Here is an example of a simple Python program that uses some of the statements described above:

```
x = 15  
y = 10  
  
if x < y:  
    print(x, "is less than ", y)  
else:  
    print(y, "is less than ", x)
```

In this code, the *if* statement checks *if* `x` is less than `y`. Since `x` is *greater than* `y`, the code inside the *else* block is executed, which prints the following message to the screen- **10 is less than 15**

Year 9 Computing: Loops and Statements

Loops

A loop is a

For loops are used to

```
for <variable> in <sequence>:  
    <block of code>
```

The variable <variable>

```
for i in range(1, 11):  
    print(i)
```

While loops are used to

```
while <condition>:  
    <block of code>
```

The block of code will be executed as long as the condition is true.
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        print(i)  
    i += 1
```

This code will print the following to the screen:

Nested loops are

Statements

Statements are

Category	Description	Example
Assignment Statements		Example: x = 5 assigns the value 5 to the variable x.
Expression Statements		
Control Flow Statements		
Function Statements	Define functions, which are reusable blocks of code. Functions can be called from anywhere in a program.	

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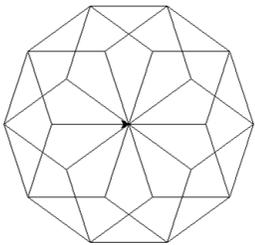
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Year 9 Computing: Python Turtle

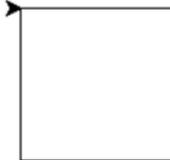
It is possible to draw using the turtle in Python. We can use loops (FOR Loops) to create intricate patterns.

A turtle will travel along a path that your algorithm defines, it will leave a pen mark behind.



The program below draws a square:

```
1 import turtle
2
3 myTurtle = turtle.Turtle()
4
5 myTurtle.forward(100)
6 myTurtle.right(90)
7 myTurtle.forward(100)
8 myTurtle.right(90)
9 myTurtle.forward(100)
10 myTurtle.right(90)
11 myTurtle.forward(100)
12 myTurtle.right(90)
13 myTurtle.home()
```

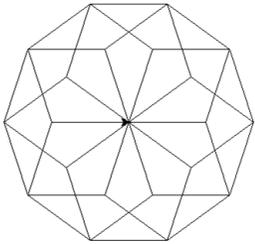


Function	Description
<code><turtle>.back(<steps>)</code>	Moves backward (opposite-facing direction) for number of steps.
<code><turtle>.begin_fill()</code>	Call just before drawing a shape to be filled.
<code><turtle>.end_fill()</code>	Call just after drawing the shape to be filled. You must call <code><turtle>.begin_fill()</code> before drawing.
<code><turtle>.fillcolor(<colour>)</code>	Set the colour used to fill. The input argument can be a string or an RGB colour. Examples: "red", "#551A8B", (0,35,102).
<code><turtle>.forward(<steps>)</code>	Moves forward (facing direction) for number of steps.
<code><turtle>.hideturtle()</code>	Makes the turtle invisible.
<code><turtle>.home()</code>	Moves to canvas origin (0, 0).
<code><turtle>.left(<degrees>)</code>	Turns anticlockwise the number of degrees.
<code><turtle>.pencolor(<colour>)</code>	Set the colour of the pen. The input argument can be a string or an RGB colour. Examples: "red", "#551A8B", (0,35,102)
<code><turtle>.pendown()</code>	Puts the pen down.
<code><turtle>.pensize(<width>)</code>	Makes the pen the size of width (positive number).
<code><turtle>.penup()</code>	Lifts the pen.
<code><turtle>.reset()</code>	Clears the drawing canvas, sends the turtle home, and resets variables to default values.
<code><turtle>.right(<degrees>)</code>	Turns clockwise the number of degrees.
<code><turtle>.setheading(<degrees>)</code>	Sets the orientation to <code><degrees></code> .
<code><turtle>.setpos(<x>, <y>)</code>	Positions the turtle at coordinates <code>(<x>, <y>)</code> .
<code><turtle>.showturtle()</code>	Makes the turtle visible.
<code>turtle.Turtle()</code>	Creates a new turtle with the variable name <code><turtle></code> .

Year 9 Computing: Python Turtle

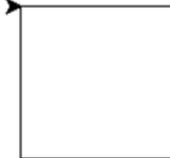
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Function	Description
<code><turtle>.back(<steps>)</code>	
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	Moves forward (facing direction) for number of steps.
	Makes the turtle invisible.
<code><turtle>.home()</code>	
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<code><turtle>.reset()</code>	
<code><turtle>.right(<degrees>)</code>	
<code><turtle>.setheading(<degrees>)</code>	
<code><turtle>.setpos(<x>, <y>)</code>	
	Makes the turtle visible.
	Creates a new turtle with the variable name <turtle>.

Year 9 Computing: Artificial Intelligence

What is artificial intelligence?

The ability of a computer to perform tasks that humans are capable of e.g. understanding language and learning. Currently this is only possible for specific tasks which is known as **weak artificial intelligence**.

What is machine learning?

A sub-field of artificial intelligence where computer models are programmed to **learn from experience**.

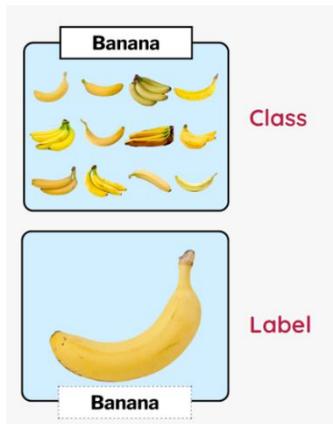
Types of A.I. that you may have heard of:

- Recommendation systems used in online stores (e.g. Amazon).
- Fraud detection in financial institutions.
- Driverless / pilotless vehicles.
- Chatbots (e.g. Chat GPT) and online customer service bots.
- Image and facial recognition in security systems.
- Medical diagnosis and healthcare systems

Classification is the process of assigning data to a **class** by applying **labels**.

A classification model is trained with **pre-labelled** data.

The model can then be used to **predict** a label for any new data.



There are different **types** of AI model that can be created using machine learning.

When choosing a type of model, you should consider:

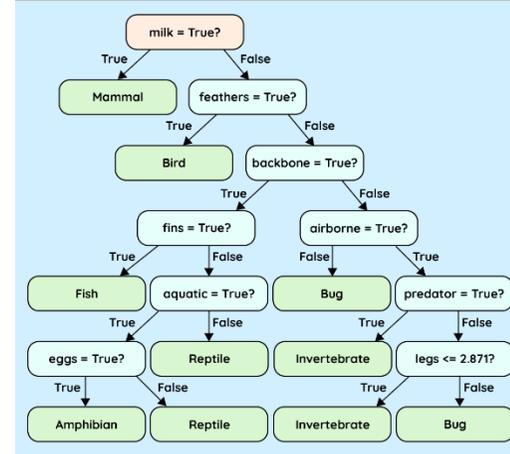
- The type of data
- The problem you are trying to solve
- The need for **explainability**

A decision tree

Decision trees are a type of model that are created using supervised learning and can be used to classify data.

Decision trees are made up of **nodes**.

The top node of a decision tree is called the **root**.



Leaf nodes will usually represent a single class.

When data is evaluated using a decision tree, the leaf you end on provides the predicted **label** for that data. E.g. **Banana**

This **decision tree** above classifies animals.

The data set used to create a decision tree contains **features**.

Some features are either **True or False**, such as 'hair', 'airborne', or 'aquatic'. Other features are **numeric**, such as 'number of legs'.

Decision trees will only work with **numeric** or **categorical data (like True/False)**.

They do not work with complex data like images, audio, video, or long text data.

Year 9 Computing: Artificial Intelligence

What is artificial intelligence?

What is machine learning?

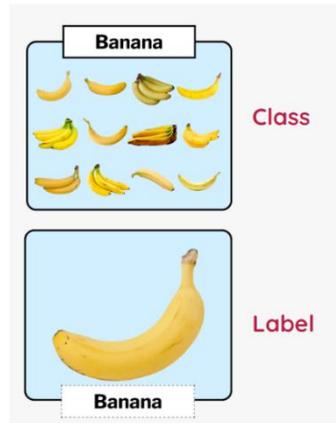
Types of A.I. that you may have heard of:

-
-
-
-
-
-

Classification is

A classification model is

The model can then be used to



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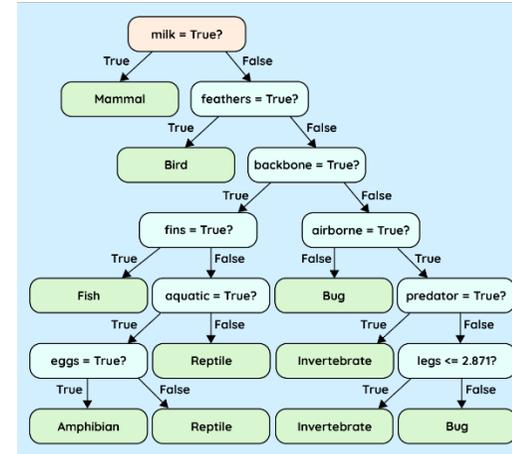
-
-
-

A decision tree

Decision trees are

Decision trees are made up of _____

The top node of a decision tree is called the _____.



Leaf nodes will

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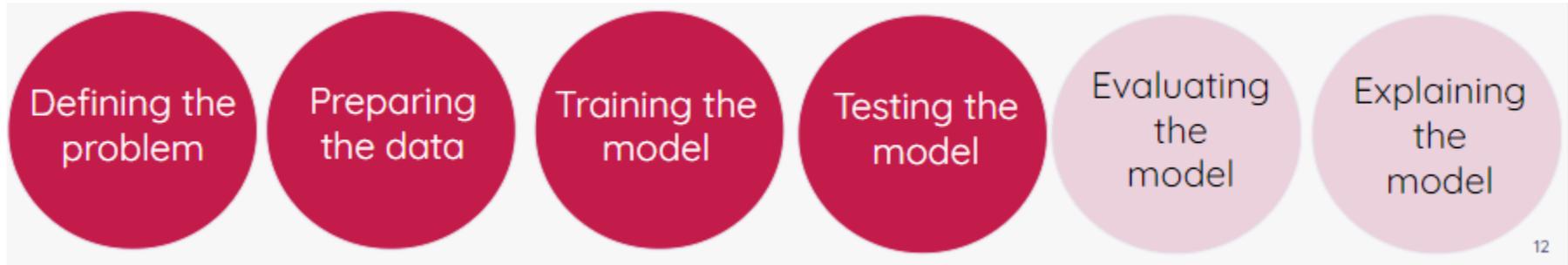
Some features are either _____, such as 'hair', 'airborne', or 'aquatic'.
Other features are _____, such as 'number of legs'.

Decision trees will only work with _____.

They do not work with _____.

Year 9 Computing: Artificial Intelligence Project life Cycle

How to solve problems with machine learning:



Stage 1: Define the problem (know what you want to predict or decide)

- Define the problem.
- Consider who will benefit from the solution
- Justify why an AI solution is suitable for solving this problem

Example: creating a model to accurately classify organic and inorganic waste to support recycling centres.

Stage 2: prepare the data

- Gather the data together that will be used to train the model.
- The data should be checked for errors (clean).

Example: images of a wide variety of common organic and inorganic waste.

Stage 3: Training the model (teach the model using the data)

Before you do this, consider how much data you will use to **train** the model and how much you need to set aside to **test** the model later.

Factors to consider:

- Using too little **training data** can mean the model is likely to make less accurate predictions.
- Using too much **training data** means you have less test data to use to help understand how accurate the model's predictions are.

Stage 4: Test the Model: Check if the model can predict correctly with new data.

- Give the model new, unseen test data and check that the model is accurately classifying it.

Example: Use unseen images of organic and inorganic waste to test the model.

Stage 5: Evaluate the Model: Measure the model's accuracy and understand its mistakes.

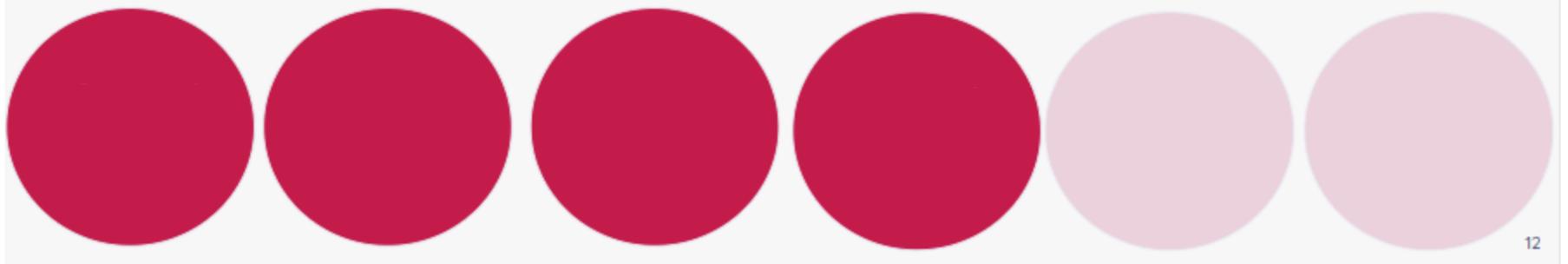
- Accuracy: check what percentage of predictions were correct.
- Errors: look for mistakes and understand why they happened.

Stage 6: Explain the Model: Know how and why the model makes its decisions.

- Feature importance: find out which pieces of data (features) were most important in making predictions.
 - Transparency: make sure you can explain the model's decisions to others.
- Example: Share your model with waste and recycling companies, making sure that they are aware of how accurate the model is at classifying organic and inorganic waste.

Year 9 Computing: Artificial Intelligence Project life Cycle

How to solve problems with machine learning:



Stage 1:

-
-
-

Example: creating a model to accurately classify organic and inorganic waste to support recycling centres.

Stage 2:

-
-

Example: images of a wide variety of common organic and inorganic waste.

Stage 3:

Factors to consider:

-
-

Stage 4:

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-
-

Stage 6:

-
-

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Design and Technology



Helping every person achieve things they never thought they could.

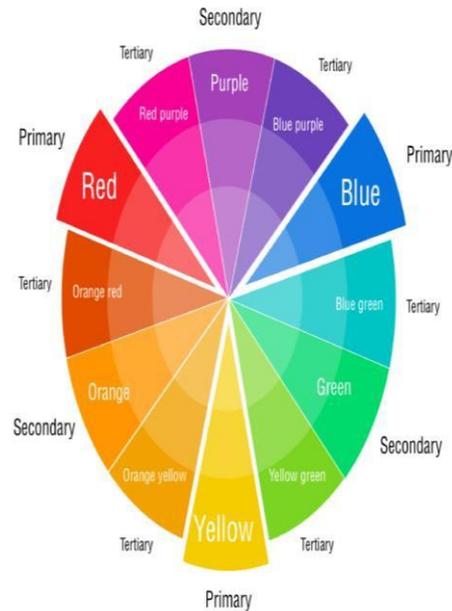
Colours

Complementary Colours

These are the ones that are directly opposite each other on the colour wheel and provide good contrast when used together.

Analogous Colours

Colours are called analogous colours when they are very similar to each other, especially when they are next to each other on a colour wheel.



- Thermoforming polymers
- Can be softened with the use of heat and moulded into shapes.
- Thermosetting polymers
- Once moulded into shape, cannot be remoulded with the use of heat.

Characteristics of Polymers

- Polymers are mainly made from crude oil.
- Polymers can be produced from synthetic sources.
- Most thermoforming polymers are recyclable.
- Most thermosetting polymers are not recyclable.
- Generally, polymers have good resistance to corrosion/degradation.
- Polymers can be moulded into shape relatively easily.
- Polymers are self-coloured.
- Polymers are sold as sheets, film, bar, rod and tubes.

Smart materials

A 'smart material' can be defined as a material whose physical properties change in response to an input e.g. making them simpler or safer to use.

Live edge acrylic sheets have a vivid fluorescent edge which 'glows' under ambient light

QTC (quantum tunnelling composite) smart materials used as the switch becomes conductive when under pressure.

Joining Plastics

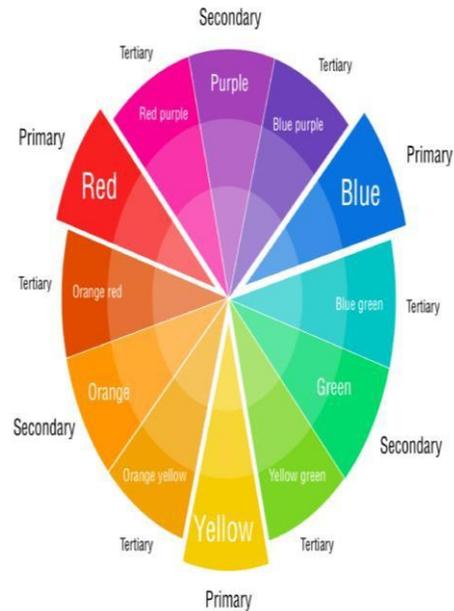
Tapping is the process of making an internal thread in a material.

Gluing using solvent cement. Fuse the two layers of acrylic together.

Colours

What are complementary colours?

What are analogous colours?



-
-
-
-

What are the characteristics of polymers?

-
-
-
-
-
-
-
-
-

Smart materials

A 'smart material' can be defined as a...

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Joining Plastics

Tapping is

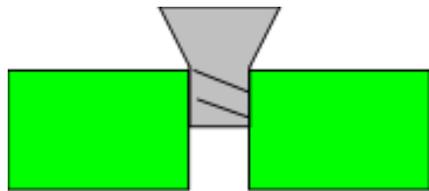
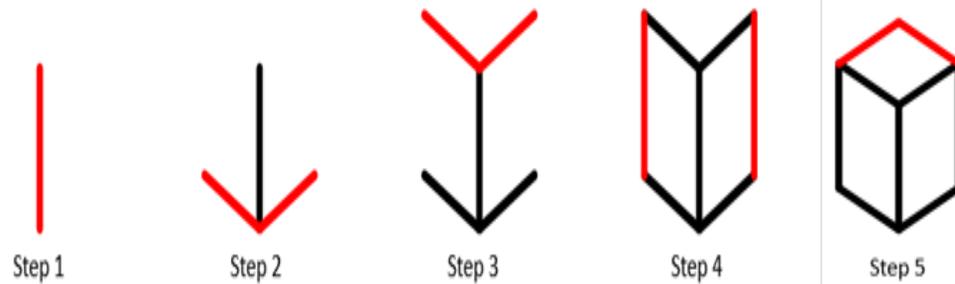
Gluing means solvent cement. Fuse the two layers of acrylic together.

Year 9 Design and Technology

Isometric Drawing

Isometric is a basic form of drawing objects in 3d (think Minecraft style!!!)

The better you get at drawing the more realistic you can make your design look.



Not Countersunk



Countersunk

Recycling Plastics

Plastics are accumulating in the natural environment and threatening wildlife, damaging ecosystems and causing large scale littering. This has a devastating impact on our oceans and marine life.

The benefits of reducing plastic consumption include: Preventing pollution by lessening the amount of new raw materials used. Saves energy. Reduces greenhouse gas emissions, which contribute towards climate change.

Shaping & Finishing Acrylic

1. Saw



2. File



3. Sand



4. Polish



Year 9 Design and Technology

Explain what isometric drawing is:

Draw your initials in isometric projection:

Explain the difference between a not countersunk and a counter sunk screw below. Draw a sketch if it helps.

Why is it important to reduce the use of single use plastic and recycle where possible?

Identify the tools for shaping and finishing acrylic

1. Saw
2. File
3. Sand
4. Polish

Drama



Helping every person achieve things they never thought they could.

Year 9 Drama: Blood Brothers

Characters

Mickey Johnstone	The lower-class twin. He is honest, sincere and goodhearted. He impregnates Linda, gets laid off, is arrested for Sammy's crime and ends up in prison and addicted to anti-depressants. His rage at Linda & Edward for having an affair drives the play's finale.
Edward Lyons	Is also good-natured but the higher-class twin. His sheltered upbringing makes him innocent but because of class he gets good opportunities e.g. university and a good job. His good-natured manner leads to the play's final scene.
Mrs Johnstone	Biological mother of the twins and a horde of other children. Left by her husband she gets a job as a cleaner. She is the moral centre of the play; is tortured by guilt and regret.
Mrs Lyons	Opposite of Mrs J whom she employs as a cleaner. She adopts Edward as her own child. Is haunted by the original act of a mother giving up her child. The guilt turns into suspicion and paranoia. She announces the affair and contributes to the murder of her adopted son.
Linda	Begins as a tomboyish young girl but both twins fancy her from an early stage. She only has eyes for Mickey as a teenager but later turns to Edward for comfort and support, which turns into an affair. Despite this, she loves both twins and is a sympathetic character.
Narrator	All-knowing and always slightly menacing- takes many roles throughout the play. Narrator constantly reminds the audience of the terrible choice that began this chain of events. Frequent mentions of fate and superstition but the Narrator claims it was class, not fate.
Sammy	When they are younger, Mickey just wants to be like Sammy. Quickly becomes a juvenile delinquent; even attempting to rob a bus as a teenager- he ends up in prison with Mickey.
Mr Lyons	Married to Mrs Lyons- away so Mrs L can adopt Edward. Grows increasingly concerned about his wife's mental health and wellbeing.



Key Words

Protagonist	the leading character or one of the major characters in a play, film, novel
Theme	An idea or subject that is repeated throughout a piece of writing or speech
Injustice	Lack of fairness
Stigmatized	Describe or regard someone or something as worthy of disgrace
Juxtaposition	Two or more contrasting ideas placed near each other.
Dramatic Irony	When the audience understands something that the characters in a play do not
Tension	A feeling of nervousness or unease before an important or difficult event
Foreshadowing	A warning or hint about a future event.
Prejudice	A preconceived opinion that is not based on reason or actual experience
Playwright	The person who writes a play
Tragedy	A genre of drama based on human suffering and, mainly, the terrible or sorrowful events that befall a main character
Vulnerable	Exposed to the possibility of being attacked or harmed, either physically or emotionally

Year 9 Drama: Blood Brothers

Characters

Write down 5 characteristics or facts about **Mickey Johnstone**:

Write down 5 characteristics or facts about **Edward Lyons**:

Write down 5 characteristics or facts about **Mrs Johnstone**:

Write down 5 characteristics or facts about **Mrs Lyons**:

Write down 5 characteristics or facts about **Linda**:

Write down 5 characteristics or facts about the **narrator**:

Write down 2 characteristics or facts about **Sammy**:

Write down 2 characteristics or facts about **Mr Lyons**:



Key Words- what are their definitions?

Protagonist

Theme

Injustice

Stigmatized

Juxtaposition

Dramatic Irony

Tension

Foreshadowing

Prejudice

Playwright

Tragedy

Vulnerable

Year 9 Drama: Blood Brothers



Key Terms

Definitions

Brief Biography

Willy Russell was born in 1947 into a working-class family near Liverpool. He left school at the age of 15 without academic qualifications and became a hairdresser. By the age of 20, he felt the need to return to education and after leaving university, he became a teacher in his home city.

Social

There was a large gap between working and middle class in Britain during this time. The Johnstones and Lyons families are class stereotypes. Many working class families struggled financially and to find work. There was also a class divide in education; this is shown when Mickey goes to secondary school and Edward attends a private boarding school.

Margaret Thatcher

The first female Prime Minister in power during that time. She was responsible for lots of working-class people losing their jobs. During her time in power, unemployment rates were raised higher than ever before. She believed everyone can be successful if they work hard.

Marilyn Monroe

A famous Hollywood movie star from the 1950s who Mrs J is compared to. She is known for being glamorous, but also struggled with depression which led her to commit suicide (by painkillers).

Themes

Superstition: The audience is constantly reminded of this. The narrator asks us if superstition is to blame for boys' fate.

Class: Russell shows us the injustice of the class divide with the Johnstones and Lyons, as well as M and E. Related to education, opportunity and power.

Nature vs. Nurture: Splitting up the twins shows us how the environment can have a huge impact on life chances.

Relationship: The development and change in friendship between M, E, and Linda. The interaction between Mr and Mrs L, mother and son, and Mrs J and society.

Key Quotations

- "Don't you know what a dictionary is?"
- "Y'know the devil's got y' number"
- "A debt is a debt and must be paid"
- "How come you got everything and I got nothin'?"
- "A mother, so cruel,/ There's a stone in place of her heart"
- "If either twin learns that he was once a pair, they shall both immediately die"
- "You've got to have an ending, if a start's been made./ No-one gets off without the price being paid"
- "I could have been him"
- "Do we blame superstition for what came to pass/ Or could it be what we, the English, have come to know as class?"
- "She's cooing and cuddling as if she were his mother. It's a, it's a thingy, innit?"
- "That's what's going to happen if I have anymore trouble from one of yours. I warned you last time"
- "It was more of a prank, really, Mr Lyons. I'd just dock his pocket money if I was you"

Year 9 Drama: Blood Brothers



Key Terms

Definitions

List 4 facts about Willy Russell

Where do we see a social class divide in the play?

List 4 facts about Margaret Thatcher

List 4 facts about Marilyn Monroe

Themes

Where do we see the theme of **superstition** in the play?

Where do we see the theme of **nature vs. nurture** in the play?

Key Quotations- fill in the missing word:

- "Don't you know what a _____ is?"
- "Y'know the devil's got y' _____"
- "A debt is a _____ and must be paid"
- "How come you got _____ and I got nothin'?"
- "A mother, so cruel,/ There's a _____ in place of her heart"
- "If either twin learns that he was once a _____, they shall both immediately die"
- "You've got to have an _____, if a start's been made./ No-one gets off without the price being paid"
- "I could have been _____"
- "Do we blame _____ for what came to pass/ Or could it be what we, the English, have come to know as class?"
- "She's cooing and _____ as if she were his mother. It's a, it's a thingy, innit?"
- "That's what's going to happen if I have anymore trouble from one of yours. I _____ you last time"
- "It was more of a 52 _____, really, Mr Lyons. I'd just dock his pocket money if I was you"

Year 9 Drama: Blood Brothers

Plot

Act 1: before birth	Act 1- 7 years old	Act 2- 14 years old
<p>The play starts with the narrator talking about a 'story about the Johnstone twins' and two men laid dead on the stage.</p> <p>We go back in time where we learn Mrs Johnstone's husband has just left her; she is very poor and already has 7 children.</p> <p>She starts a new job cleaning Mrs Lyons' house and finds out she's expecting twins.</p> <p>She strikes up a deal with Mrs L as she can't afford to keep both so Mrs L convinces Mrs J to give her one of the babies as her husband is currently away on business and she can't have a child of her own.</p> <p>The babies are born and Mrs J begrudgingly hands one of the babies over for Mrs L to later find out.</p> 	<p>Mickey and Eddie meet for the first time at the park and become 'blood brothers' when they find out they share the same birthday.</p> <p>When Mrs J realises the two have met, she is horrified.</p> <p>Mrs L reacts more violently and slaps Edward when he swears at her. She even contemplates uprooting her entire family in order to escape.</p> <p>Despite their mothers' disapproval, the boys continue to see each other and play with their friend, Linda. They play various pranks and end up getting caught by the police.</p> <p>Mrs L decides they should move.</p> <p>Before Edward leaves Mrs J gives him a locket with a picture of herself and Mickey. The Johnstones also find out they are being relocated.</p>	<p>Both boys have become interested in girls but feel awkward.</p> <p>Edward attends boarding school.</p> <p>Mickey and Linda have romantic feelings for each other but Mickey's lack of confidence is getting in the way.</p> <p>Mickey and Eddie both struggle at school- Mickey insults a teacher and Edward refuses to take off the locket. When Mrs L finds out, she's appalled but is more upset when she sees the content of the locket.</p> <p>Mickey and Edward meet, by circumstance again- Mickey takes Edward back to his but they are not aware that Mrs L is following them.</p> <p>Once the boys leave the house, Mrs L attacks Mrs J with a knife and curses her, calling her a witch.</p> <p>The boys meet with Linda and spend the summer together- an idyllic sequence follows as the trio age from 14 to 18.</p>

Year 9 Drama: Blood Brothers

Plot

Act 1: before birth

1. Who is first to appear on the stage?
2. How many children does Mrs Johnstone have at the beginning of the play?
3. What job does Mrs Johnstone begin?
4. What deal does Mrs Johnstone make with Mrs Lyons and why?
5. What does Mrs Lyons do to Mrs Johnstone at the end of the act?



Act 1- 7 years old

6. Where do Mickey and Edward meet for the first time?
7. How does Mrs Johnstone feel when she finds out the boys have met?
8. How does Mrs Lyons react when she finds out the boys have met each other?
9. Who is Mickey and Edward's friend?
10. What dramatic decision does Mrs Lyons make for her family?
11. What does Mrs Johnstone give Edward before he leaves?
12. What do the Johnstone family find out at the end of the act?

Act 2- 14 years old

13. What are both boys interested in at the beginning of this act?
14. What kind of school does Edward attend?
15. What gets in the way of Mickey and Linda's relationship?
16. How do both Mickey and Edward individually struggle at school?
17. When Mickey and Edward meet again, what are they not aware of?
18. What does Mrs Lyons call Mrs Johnstone?
19. Who do Mickey and Edward spend the summer with?

Year 9 Drama: Blood Brothers

Plot

Act 2- 18 years old

At 18 in the sequence, the narrator warns that soon, both their joy and childhood will end.

Edward has developed feelings for Linda and is at university whilst Mickey works in a factory.

Edward self-sacrifices his feelings and encourages Mickey to ask Linda to be his girlfriend and she accepts.

In October, Mickey tells his mum that Linda is pregnant and the two will be getting married. Their wedding coincides with a huge economic downturn resulting in Mickey getting paid off.

When Edward returns from Christmas, Mickey is downtrodden and claims 'blood brothers' is childish.

Edward confesses his love to Linda but she tells him she is married and pregnant.

A desperate Mickey participates in a burglary with Sammy that goes wrong resulting in Sammy killing a man.

They are both sentenced to prison and Mickey becomes depressed and is prescribed antidepressants which he becomes addicted to, even after he's been released.

Act 2- the end

Mickey continues to take the pills despite Mrs J & Linda's pleas.

Linda, desperate, asks Edward, now a city councilman, to find them an apartment and getting Mickey a job.

Mickey is angry about this and a devastated Linda seeks comfort with Edward and begins an affair with him.

The affair continues and Mickey stops taking his pills for Linda's sake.

Mrs Lyons reveals Linda and Edward's affair to Mickey. Enraged, he takes Sammy's gun out of the floorboards and confronts Edward, with a distraught Mrs J and Linda trying to get him to stop.

Mickey finds and confronts Edward at the town hall about the affair, as well as whether Mickey's daughter is actually his. Edward denies fathering Mickey's child.

The police surround the area and Mrs J bursts in and tells the boys they are twins separated at birth. Mickey asks why he couldn't have been Edward and then accidentally pulls the trigger of the gun, shooting and immediately killing Edward, the police then shoot Mickey.

The play ends with the boys led on the stage and the narrator wonders what really killed the twins: superstition or the class system?



Year 9 Drama: Blood Brothers

Plot

Act 2- 18 years old

Act 2- the end

20. What does the narrator warn at the beginning of the act?

21. Where does Mickey work?

22. What does Edward encourage Mickey to do?

23. What is happening at the same time as Mickey and Linda getting married?

24. How is Mickey feeling when Edward returns from university?

25. What does Edward tell Linda when he returns?

26. What happens when Sammy and Mickey complete a burglary?

27. What happens to Mickey in prison?

28. What does Mickey do against Linda's wishes?

29. What help does Linda ask Edward for?

30. What happens next between Edward and Linda?

31. What who tells Mickey about the new relationship and what does Mickey do when he finds out?

32. Why does Mickey find Edward?

33. How do each of the brothers die?

34. What is the narrator's question at the end of the play?



Year 9 Drama:

Abstract Theatre	Abstract theatre is centred around the concept of representing situations and emotions, as opposed to acting them out in a realistic way.
Physical Theatre	A style of theatre where the actor uses their body as the primary tool for performance.
Spontaneous Improvisation	Improvising a scene where there has been no previous discussion or planning before acting .
Prepared Improvisation	Improvising a scene where there has been some discussion and planning before acting .
Cross-cutting	Freezing the action on one side of the stage in one location, whilst we see a snippet from another location on the other side. Cross-cutting between both scenes .
Split scene	Two scenes happening at once on stage . (Good for miming so we don't have talking over each other).
Multi-Rolling	Multi-rolling is when an actor plays more than one character onstage. The differences in character are marked by changing voice, movement, gesture and body language but the audience can clearly see that the same actor has taken on more than one role.
Split Role	This is where more than one actor plays the same character . For instance, the actor playing the main character might rotate from scene to scene. This keeps that character representational and inhibits emotional involvement and attachment on the part of the audience.
Mime	A form of drama that uses gestures, actions and facial expressions to tell the story without words .
Direct Address	Speaking directly to the audience , this breaks the fourth wall and destroys any illusion of reality.
Thought Tracking	A thought-track is when a character steps out of a scene to address the audience about how they're feeling .
Placards	Signs were held up to tell the audience the title of the scene and even what was going to happen in them, this was to take away suspense and emotion and allow the audience to think about the scene instead.
Representational Costume	The actors would simply put on one item of clothing, or an accessory such as a hat or glasses to represent that they were a particular character –they didn't try to 'become' the character.

Bertolt Brecht 1898 – 1956

Brecht was born in Augsburg, Germany. He served as a medical orderly in World War 1 and he was appalled by what he saw during the war. The turmoil at the time of the war gave Brecht a very strong political voice which carried into his work.

Bertolt Brecht is one of the most important figures in Drama history. His methods and techniques are still used today across the world. His most acclaimed piece was ***Mother Courage and Her Children***.

• Epic Theatre

- Brecht focused on the idea of **objectivity** (being fact based and not focused on personal beliefs or feelings) in theatre. Using this, he developed a concept of theatre that's called **Epic theatre**.
- Brecht used techniques that remind the audience that the play is a representation of reality and not reality itself. Brecht thought that openly showing how the play was constructed, this would communicate that the audience's reality was equally 'constructed', and as such, was changeable.



Year 9 Drama:

Abstract Theatre	
Physical Theatre	
Spontaneous Improvisation	
Prepared Improvisation	
Cross-cutting	
Split scene	
Multi-Rolling	
Split Role	
Mime	
Direct Address	
Thought Tracking	
Placards	
Representational Costume	

Bertolt Brecht 1898 – 1956

Brecht was born in _____, Germany. He served as a medical orderly in World War 1 and he was appalled by what he saw during the war. The _____ at the time of the war gave Brecht a very strong political _____ which _____ into his work.

Bertolt Brecht is one of the most important _____ in Drama history. His _____ and techniques are still used today across the world. His most acclaimed _____ was ***Mother Courage and Her _____***.

Epic Theatre

- Brecht focused on the _____ of _____ (being fact based and not focused on personal beliefs or feelings) in theatre. Using this, he developed a _____ of _____ that's called _____ theatre.
- Brecht used techniques that remind the audience that the play is a representation of _____ and not reality itself. _____ thought that openly showing how the _____ was constructed, this would communicate that the audience's reality was equally '_____', and as such, was changeable.



Year 9 Drama:

Musical Theatre

Musicals are usually performed in theatres, most famously on Broadway and in the West End of London. Broadway is also used as a general term to refer to American musicals.

Musicals set out to entertain through a combination of:

- **catchy music in a popular style.**
- **solo songs, duets, choruses and ensembles.**
- **orchestra or band accompaniment.**
- **spoken dialogue.**
- **dance sequences, stage spectacles and magnificent costumes.**

Shrek - The Synopsis

Shrek the Musical is a one-of-a-kind, hilarious fairy tale in which curses are reversed, monsters get the girls, donkeys and dragons find love, and princesses are beautiful in all shapes and sizes. Grumpy, gruff, green ogre Shrek lives alone in his swamp. The world is fearful and mocking of him, and he is more than happy to leave the world to itself, in turn. Suddenly, his hermit existence is thrown open, when a group of homeless fairy tale characters — Pinocchio, the Gingerbread Man, the Three Little Pigs, and more — burst upon his swamp, seeking refuge from the persecution of the cruel, vertically-challenged Lord Farquaad.

Shrek seeks out Farquaad, who offers him a deal: if Shrek rescues the Princess Fiona (whom Farquaad wishes to marry for her crown), then Farquaad will ensure the return of Shrek's swamp by returning the fairy tale creatures to their homes. In a desperate attempt to regain his swamp's hermetic piece, Shrek enters the world for the first time in his life. He travels to Princess Fiona's prison, rescues her from a fire-breathing dragon, and then - scariest of all - is forced to get to know the princess as he tries to bring her back to evil Farquaad.

To the determinedly unsocial ogre's dismay, Fiona is very different from what he expected a princess to be. She may even provoke Shrek's most novel experience yet: Love.

Terminology (Physical Skills)

- **Gesture** - an action of the body *i.e. pointing a finger or tilting the head.*
- **Mannerism** - a habitual movement *i.e. twitching the nose, licking the lips.*
- **Body Language** - non verbal communication of the body to show emotion.
- **Facial Expressions** - how the face conveys emotion *i.e. an angry face shows furrowed eyebrows, pursed lips, squinted eyes, scrunched nose and forehead.*
- **Proxemics** - how the stage space is used effectively to show something (*i.e. relationships between characters*).
- **Gait** - how a character moves *i.e. the Villain took big strides across the stage on tip toes lunging with his knees.*
- **Energy** - low level or high level.
- **Posture** - how a person carries themselves sitting or standing *i.e. - shoulder back, chest out, chin up, feet together.*
- **Eye Contact & Focus** - the state in which two people are aware of looking directly into one another's eyes. Or where the eyes are focused.
- **Relationship** - *how the character interacts with others on stage.*



Terminology (Vocal Skills)

- **Accent** - shows where the character is from.
- **Volume** - How loudly or softly you speak.
- **Diction** - informal / slang the way in which you pronounce words clearly.
- **Tone** - how the voice conveys emotion.
- **Pitch** - High or low voice.
- **Pace** - Speed of delivering dialogue.
- **Pause** - used for effect.
- **Intonation** - where the pitch goes up at the end of a sentence *i.e. a question.*
- **Timing** - considered carefully for effect.
- **Emphasis** - where a word or sound is exaggerated for effect.

Year 9 Drama:

Musical Theatre

Musicals are usually _____ in theatres, most famously on Broadway and in the West End of London. _____ is also used as a general term to refer to _____ musicals.

Musicals set out to entertain through a combination of:

- catchy
- solo
- orchestra
- spoken
- dance

Shrek - The Synopsis

Can you write a brief synopsis of the story?

Terminology (Physical Skills)

- **Gesture** -
- **Mannerism** -
- **Body Language** -
- **Facial Expressions** -

- **Proxemics** -

- **Gait** -

- **Energy** -
- **Posture** -

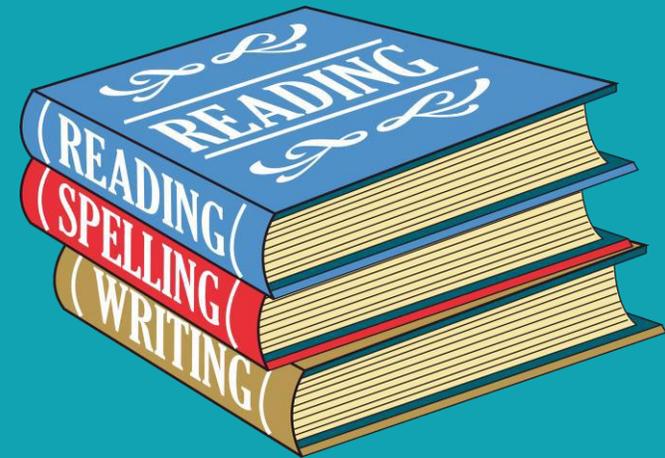
- **Eye Contact & Focus** -



Terminology (Vocal Skills)

- **Accent** -
- **Volume** -
- **Diction** -
- **Tone** -
- **Pitch** -
- **Pace** -
- **Pause** -
- **Intonation** - .
- **Timing** -
- **Emphasis** - .

English



Helping every person achieve things they never thought they could.

Year 9 English: 'Boys Don't Cry' and Transactional Writing

An **idiom** is a metaphor we use so much it is common in speech e.g. 'over the moon', 'see the light'.

An **extended metaphor** is a metaphor that continues over a number of sentences, rather than just in one.

An **allusion** is a reference to something outside of the text that the reader would recognise. (A famous person, place or event).

Symbolism is where an object, character or event represents something else, in the text or in real life.

A **colloquial tone** is chatty and informal, almost like spoken language.

A **semantic field** is a group of words linked by meaning e.g. 'battle, platoon, death, destruction, grief and honour all form the semantic field of war.

Knowledge for Reading

Writing about Literature

- P** Point *Answer the question*
- E** Evidence *Include a quote*
- A** Analyse *Explain the inferences behind the quote in detail*
- Z** Zoom *Explain what a powerful word or technique suggests*
- E** Effect *Explain what the writer wants us to feel or think*
- L** Link *Explain how these ideas link to the real world*

Knowledge for Writing

We use a new paragraph when we change the **time, place, topic or person** we are writing about. (TIP ToP)
The first line of every paragraph should be a **topic sentence**, which gives a clue about what the paragraph with focus on.

Connectives are words and phrases that connect ideas together in writing. They often appear in the first line (**topic sentence**) of a paragraph, to link the paragraphs together.

Type of Connective	Examples		
Adding	Also	In addition	Furthermore
Sequencing	Firstly	Finally	Meanwhile
Emphasising	Above all	Especially	Most importantly
Comparing	Similarly	Likewise	In the same way
Contrasting	In contrast	Conversely	On the other hand
Illustrating	For example	For instance	This can be seen in
Introduce an attitude	I believe	In my view	Some might argue

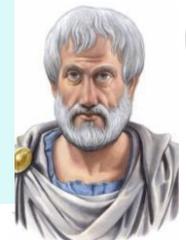
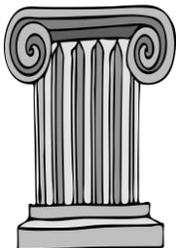


Aristotle's Three Pillars of Rhetoric (Persuasion) :Aristotle was an Ancient Greek philosopher who argued that you must include three types of persuasion in your writing/speech to effectively convince an audience.

Logos – Your reasons and arguments make logical sense (explained, proved and factual)

Pathos – Provoke an emotional reaction in your audience (emotive language, exaggeration, adjectives)

Ethos – Prove you are credible, trustworthy and you know your stuff! (use statistics , research and evidence)



Year 9 English: 'Boys Don't Cry' and Transactional

What is an idiom?

What is an **extended metaphor**?

What is an **allusion**?

What is **symbolism**?

What is a **colloquial tone**?

What is a **semantic field**?

Knowledge for Reading

Writing about Literature

- P** Point Answer the question
- E** Evidence Include a quote
- A** Analyse Explain the inferences behind the quote in detail
- Z** Zoom Explain what a powerful word or technique suggests
- E** Effect Explain what the writer wants us to feel or think
- L** Link Explain how these ideas link to the real world

Knowledge for Writing

When do we use a new paragraph?

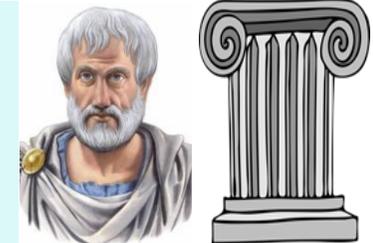
What are **connectives**?

Type of Connective	Examples		
Adding			
Sequencing			
Emphasising			
Comparing			
Contrasting			
Illustrating			
Introduce an attitude			



Aristotle's Three Pillars of Rhetoric (Persuasion) :Aristotle was an Ancient Greek philosopher who argued that you must include three types of persuasion in your writing/speech to effectively convince an audience.

- What is logos?
- What is pathos?
- What is ethos?



Year 9 English:

Vocabulary	Definition	Example
1. Intrigue	Make someone curious and interested to find something out.	<i>The opening of a narrative must intrigue the reader.</i>
2. Tension	Where a writer builds an expectation that something frightening or dramatic is going to happen.	<i>The horror film built tension as the characters walked through the graveyard.</i>
3. Powerless	Something has no power.	<i>The flowers were powerless in the wind.</i>
4. Equality	Fair rights and opportunities for everyone.	<i>The rules created equality for all people.</i>
5. Aspiration	An aim or ambition for the future.	<i>It is my aspiration to travel the world.</i>
6. Tone	The attitude or emotion behind a piece of speech or writing.	<i>She spoke with a sarcastic tone.</i>
7. Responsibility	Having a duty to perform a task or take care of something, because you have power and control over it.	<i>It is everyone's responsibility to care for the environment.</i>
8. Inner Conflict	A character has a mental struggle over a decision or what is right or wrong.	<i>Dante suffered an inner conflict as he couldn't decide what to do for the best.</i>
9. Identity	The parts of your character, personality, interests, culture and background that make a person who they are.	<i>His family traditions were an important part of his identity.</i>
10. Theme	A subject or topic that occurs throughout a text.	<i>The theme of family is central to the novel 'Boys Don't Cry'.</i>

Grammar	11. Main Clause	12. Subordinate clause	13. Parenthesis	14. Fronted Adverbial	15. Prepositional phrase	16. Minor Sentence
	A phrase that makes sense on its own, as it has a subject and a verb	A phrase that doesn't make sense on its own. It adds information to the main clause.	Extra explanations added into sentences	An adverb, or adverbial phrase, used at the beginning of the sentence to suggest how, when or where something happened.	A phrase that tells you when or where something is in relation to something else.	A sentence that does not make grammatical sense on its own (as it doesn't have both a subject and verb) but is used as a sentence
	<i>Dante loved his child.</i>	<i>In the middle of the night,</i>	<i>The novel is set in America.</i>	<i>Yesterday, Dante's life changed forever.</i>	<i>On, at, in next to, yesterday, after, during, before, sometimes</i>	<i>Oh no!</i>

Punctuation

17. Dashes - -

Add extra information to a sentence
Dante's life changed forever - in just a matter of seconds

18. Brackets ()

Add parenthesis (extra information) to a sentence

19. Comma ,

Add extra information to a sentence

Dante's life changed forever, in just a matter of seconds.

Year 9 English:

Vocabulary	Definition	Example
1. Define <i>intrigue</i>		<i>The opening of a narrative must intrigue the reader.</i>
2. Define <i>tension</i>		<i>The horror film built tension as the characters walked through the graveyard.</i>
3. Define <i>powerless</i>		<i>The flowers were powerless in the wind.</i>
4. Define <i>equality</i>		<i>The rules created equality for all people.</i>
5. Define <i>aspiration</i>		<i>It is my aspiration to travel the world.</i>
6. Define <i>tone</i>		<i>She spoke with a sarcastic tone.</i>
7. Define <i>responsibility</i>		<i>It is everyone's responsibility to care for the environment.</i>
8. Define <i>inner conflict</i>		<i>Dante suffered an inner conflict as he couldn't decide what to do for the best.</i>
9. Define <i>identity</i>		<i>His family traditions were an important part of his identity.</i>
10. Define <i>theme</i>		<i>The theme of family is central to the novel 'Boys Don't Cry'.</i>

Grammar	11. What is a main clause?	12. What is a subordinate clause?	13. What is parenthesis?	14. What is a fronted adverbial?	15. What is a prepositional phrase?	16. What is a minor sentence?
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Punctuation

17. What do dashes do?

18. What do brackets do?

19. What do commas do?

English: Spelling Challenge- Most commonly misspelled words.



1. Acceptable	11. Believe	21. Disappear	31. Foreign	41. Ignorance
2. Accidentally	12. Calendar	22. Disappoint	32. Fourth	42. Immediate
3. Accommodate	13. Category	23. Drought	33. Gauge	43. Independent
4. Acquire	14. Cemetery	24. Embarrass	34. Generally	44. Indispensable
5. Acquit	15. Changeable	25. Equipment	35. Grammar	45. Intelligence
6. A lot	16. Collectible	26. Exceed	36. Grateful	46. Interrupt
7. Amateur	17. Committed	27. Excite	37. Guarantee	47. Judgement
8. Apparent	18. Conscience	28. Existence	38. Harass	48. Knowledge
9. Argument	19. Conscientious	29. Experience	39. Height	49. Leisure
10. Because	20. Definitely	30. February	40. Hierarchy	50. Library

English: Spelling Challenge- Most commonly misspelled words.



1.	11.	21.	31.	41.
2.	12.	22.	32.	42.
3.	13.	23.	33.	43.
4.	14.	24.	34.	44.
5.	15.	25.	35.	45.
6.	16.	26.	36.	46.
7.	17.	27.	37.	47.
8.	18.	28.	38.	48.
9.	19.	29.	39.	49.
10.	20.	30.	40.	50.

English: Spelling Challenge- Most commonly misspelled words.



51. Lightning	61. Occurrence	71. Questionnaire	81. Rhythm	91. Umbrella
52. Maintenance	62. Official	72. Receive	82. Schedule	92. Vacuum
53. Manoeuvre	63. Parallel	73. Recommend	83. Scissors	93. Vicious
54. Millennium	64. Parliament	74. Referred	84. Sensible	94. Whether
55. Miniature	65. Particle	75. Reference	85. Separate	95. Weigh
56. Minute	66. Pigeon	76. Relevant	86. Special	96. Weird
57. Mischievous	67. Possession	77. Religious	87. Success	97. Whistle
58. Noticeable	68. Preferable	78. Restaurant	88. Tomorrow	98. Wonderful
59. Occasion	69. Principle	79. Ridiculous	89. Twelfth	99. Yoghurt
60. Occur	70. Privilege	80. Rhyme	90. Tyranny	100. Youth

English: Spelling Challenge- Most commonly misspelled words.



51.	61.	71.	81.	91.
52.	62.	72.	82.	92.
53.	63.	73.	83.	93.
54.	64.	74.	84.	94.
55.	65.	75.	85.	95.
56.	66.	76.	86.	96.
57.	67.	77.	87.	97.
58.	68.	78.	88.	98.
59.	69.	79.	89.	99.
60.	70.	80.	90.	100.

Year 9 English: Protest poetry and Transactional Writing

Knowledge for Reading

Quotations are words and phrases from the text, that you put into your work to prove your ideas are accurate.
Quotations should be **embedded (blended) into your explanations.**

You can **blend patterns of quotations** into your explanations to show similar or opposing ideas.

A poem's structure can symbolise deeper ideas in the way language can. You can manipulate the structure of a poem

Stanza
Section of a poem. The length of a stanza can represent a deeper meaning.

Enjambment
A sentence continues over one (or more) lines. Symbolising something being everlasting, continuous or out of control.

Caesura
Punctuation is used in the middle of a line to create a pause.

Comparing Poetry

- P Point**
Answer the question
- E Evidence**
Embed a quote, or pattern of quotes that juxtapose or reinforce each other
- A Analyse**
Explain the inferences behind the quote in detail using as/so/ because/which
- Z Zoom**
Explain the connotations of a powerful word or technique has and the effect of ^{this}
- E Effect**
Explain what the writer's intention is/ what they are trying to teach the reader
- L Link to Context**
Explain how these ideas link to the real world
- C Compare to second poem in detail**
Explain similar or different meanings, messages and methods

Knowledge for Writing

All people speak with an accent or dialect.
Accent - The way we sound and pronounce words, influenced by the area/region you live in.

Dialect - The words, phrases and grammar we use, influenced by the area/region you live in.

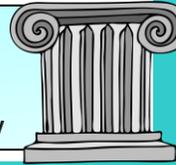
Standard English - Thought to be 'correct' English. It is the dialect of English we are expected to write in.

Text Formats	Features you would find in this text		
Letter	Date and sender's address	Dear____. Yours sincerely ____	Direct address
Article	Headlines	Facts and information	Hyperbole
Leaflet	Heading and subheadings	Bullet points	Advice and information
Speech	Direct address	Anecdotes	Hyperbole
Travel Writing	Headline	Description of places	Exaggerated opinions

Romanticism and The Romantic Poets

Romanticism is a term used to describe developments in literature, art and music in the late 18th and early 19th century. Some key Romantic ideas include

- The power of nature
- Imagination
- Revolution and rejection of absolute power
- The world of children
- People in poverty



Year 9 English: Protest poetry and Transactional Writing

Knowledge for Reading

What are quotations?

What does it mean to embed quotations?

Why should you use patterns of quotations?

What can the structure of a poem be used for?

What is a stanza?

What is enjambment?

What can it symbolise?

What is caesura?

Comparing Poetry

- P** Point _____
- E** Evidence _____
- A** Analyse _____
- Z** Zoom _____
- E** Effect _____
- L** Link to Context _____
- C** Compare to second poem in detail _____

Knowledge for Writing

What is an accent?

What is a dialect?

What is Standard English?

Text Formats	Features you would find in this text		
Letter			
Article			
Leaflet			
Speech			
Travel Writing			

Romanticism and The Romantic Poets

What is Romanticism?

What ideas are included?

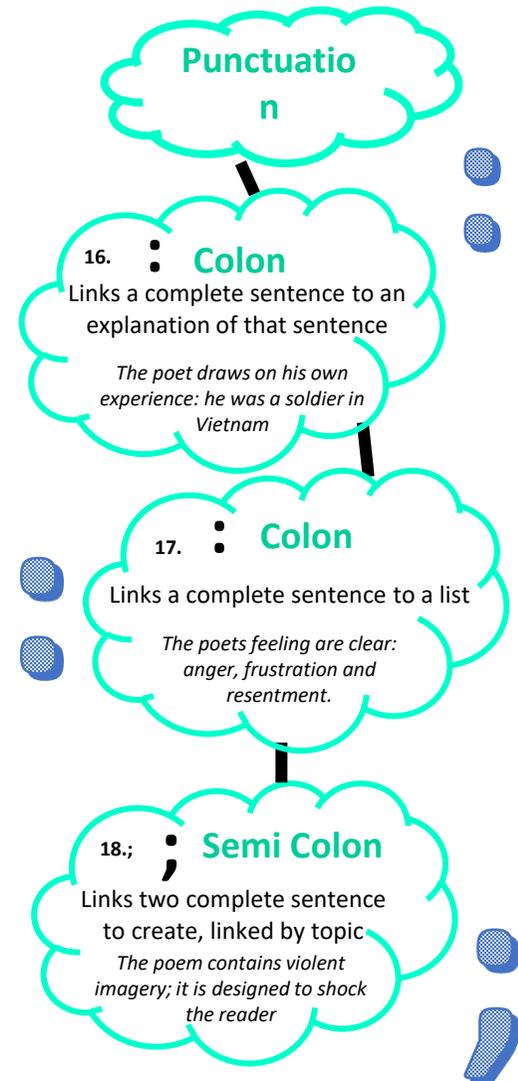
_____ - _____ - _____ - _____ - _____



Year 9 English: Protest poetry and Transactional Writing

Vocabulary	Definition	Example
1. Protest	Showing that you disagree or disapprove of something	<i>The civilians demonstrated their views in the form of a protest</i>
2. Allegory	A text with a moral meaning or message	<i>The poem is an allegory, teaching of the importance of a person's identity</i>
3. Social Criticism	A texts that points out what is wrong with society	<i>The poem acts as a social criticism.</i>
4. Provoke	To intentionally make a person react or behave in a certain way	<i>The text is designed to provoke anger in the reader.</i>
5. Exploitation	Where a person takes advantage over someone who is desperate	<i>Blake exposes the exploitation that resulted from The Industrial Revolution</i>
6. Perspective	The point of view comments are made from	<i>The writer's perspective is biased</i>
7. Patriarchal	Describes a society that is controlled by men	<i>The poem criticises the patriarchal society</i>
8. intention	The reason someone does something	<i>The writer's intention was to question the country's leadership</i>
9. Promote	To encourage or raise awareness of something	<i>The poem promotes tolerance</i>
10. Discrimination	Limiting the rights of people based on the category they belong to e.g. age, race, gender, disability etc.	<i>The poem alludes to the discrimination of women in the 1800s</i>

Grammar	11. Subject	12. Verb	13. Subject-Verb Agreement	14. Conjunctions	15. Compound sentence
	The 'thing' a sentence is about. It can be a noun or pronoun.	An action or being word. A sentence must have a verb to be a complete sentence.	The number in the subject impacts the choice of verb that follows	Words that connect two clauses (for, and, nor, but, or, yet, so)	Two main clauses joined by a connective. These are used to provide information quickly.
	<i>The poem is written in first person.</i>	<i>The poet writes about fear.</i>	<i>They are... She is... I am...</i>	<i>The poet feels annoyed by the attitudes and enthusiastic about change</i>	<i>The poem questions the government's policy yet they don't offer a solution</i>



Year 9 English: Protest poetry and Transactional Writing

Vocabulary	Definition	Example
1. Protest		
2. Allegory		
3. Social Criticism		
4. Provoke		
5. Exploitation		
6. Perspective		
7. Patriarchal		
8. intention		
9. Promote		
10. Discrimination		

Punctuation

16. **:** **Colon**

The poet draws on his own experience: he was a soldier in Vietnam

17. **:** **Colon**

The poets feeling are clear: anger, frustration and resentment.

18.; **;** **Semi Colon**

The poem contains violent imagery; it is designed to shock the reader

Grammar	11. <u>Subject</u>	12. <u>Verb</u>	13. <u>Subject-Verb Agreement</u>	14. <u>Conjunctions</u>	15. <u>Compound sentence</u>
	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____
	<i>The poem is written in first person.</i>	<i>The poet <u>writes</u> about fear.</i>	<i>They are... She is... I am...</i>	<i>The poet feels annoyed by the attitudes <u>and</u> enthusiastic about change</i>	<i>The poem questions the government's policy yet they don't offer a solution</i>

Year 9 English: Othello and Descriptive Writing

Knowledge for Reading

Plays are written by playwrights.

Othello is an **allegory**. This is a text with a moral message or lesson.

A **protagonist** is the central character that the audience follows throughout a story, (often a hero)

An **antagonist** is a character that opposes or challenges the protagonist (often a villain)

Aside
Where the character speaks their mind. The characters cannot hear what is said, but the audience can.

Dramatic Irony
The audience know something the characters don't know.

Soliloquy
A long speech where the character speaks their mind to the audience, without the other character's knowing.

Writing about Literature

- P Point**
Answer the question
- E Evidence**
Embed a quote, or pattern of quotes that juxtapose or reinforce each other
- A Analyse**
Explain the inferences behind the quote in detail using as/so/ because/which
- Z Zoom**
Explain the connotations of a powerful word or technique has and the effect of this
- E Effect**
Explain what the writer's intention is/ what they are trying to teach the reader
- L Link to Context**
Explain how these ideas link to the real world

Knowledge for Writing

Rules for Descriptive Writing

RULE 1: Show DON'T tell

Rather than telling the reader what is happening or how a character is feeling, show them by describing movement, atmosphere, sounds etc.

RULE 2: Nothing much should happen

You are describing a scene, not telling a story. Therefore, nothing should happen (imagine describing a paused scene in a film)

RULE 3: Stick to the same tense

Proof-read your work to make sure you don't move from past to present tense (without meaning to)

RULE 4: Vocabulary is more important than spelling

Interesting words and phrases are more effective that accurately spelt, boring words!

3 ways to make a metaphor

Give an emotion a colour

Bring an object to life

Give the weather an emotion

In all Shakespeare's tragedies, the main character is a

TRAGIC HERO.

All tragic heroes had to have 4 characteristics...



1. Respected and admired at the beginning
2. Has a fatal flaw (hamartia) that leads to his downfall
3. Be both good and evil
4. Die at the end of the play



Year 9 English: Othello and Descriptive Writing

Knowledge for Reading

Who writes a play?

What is a allegory?

What is a protagonist?

What is an antagonist?

What is an aside?

What is dramatic irony?

What is Soliloquy?

Writing about Literature

- P** Point
- E** Evidence
- A** Analyse
- Z** Zoom
- E** Effect
- L** Link to Context

Knowledge for Writing

Rules for Descriptive Writing

RULE 1: Show DON'T tell

RULE 2: Nothing much should happen

RULE 3: Stick to the same tense

RULE 4: Vocabulary is more important than spelling

3 ways to make a metaphor

--	--	--

In all Shakespeare's tragedies, the main character is a

TRAGIC HERO.



- 1.
- 2.
- 3.
- 4.



Year 9 English:

Vocabulary	Definition	Example
1. Tragedy	A genre of play, involving a downfall of a character and disastrous events	<i>Shakespeare's tragedies include Macbeth, Hamlet and Othello.</i>
2. Deception	The action of lying or hiding the truth from someone	<i>Iago's deception contributes to Othello's downfall</i>
3. Conflict	An argument, disagreement or clash between people or ideas	<i>Othello's inner confidence (between low self-esteem and confidence) leads to his downfall</i>
4. Allusion	A reference to a person, event or place outside of the text, that the audience would recognise	<i>Shakespeare includes many allusions to Greek Mythology throughout the play</i>
5. Patriarchy	A society where men hold the power and women are excluded from powerful positions	<i>Jacobean England was a patriarchy</i>
6. Prejudice	Having opinions on people that are not based on facts	<i>Othello faces prejudice as a black army general</i>
7. Hubris	Too much pride and arrogance	<i>The play warns against the dangers of hubris</i>
8. Envy	Jealously, wanting what other people have	<i>Iago is a symbol of envy</i>
9. Honour	Being respectful and knowing what is morally right	<i>Iago has no honour</i>
10. Justice	Where people get that they deserve – both good and bad	<i>In tragedies, justice is rarely served as the good often suffer and the evil often triumph</i>

Punctuation

17. , Commas

Add extra information to a sentence
Othello's life changed forever, in just a matter of seconds.

18. () Brackets

Add extra information to a sentence
Othello's life changed forever (in just a matter of seconds).

19. - Dashes

Add extra information to a sentence
Othello's life changed forever - in just a matter of seconds

Grammar

11.

Adverbial

Give more information about how or when an action in a sentence takes place.

Yesterday, always, usually, slowly, fully, certainly, delightfully, next month

12.

Fronted Adverbial

Give more information about how or when an action in a sentence takes place, at the beginning of the sentence.

*Yesterday, _____
 Respectfully, _____*

13.

Prepositional Phrases

Phrases that tell you when or where something is in relation to something else

*Later that day
 Under the table*

14.

Definite Article

Introduces a specific noun
The

Indefinite Article

Introduces a noun that is not specific
An/An

15.

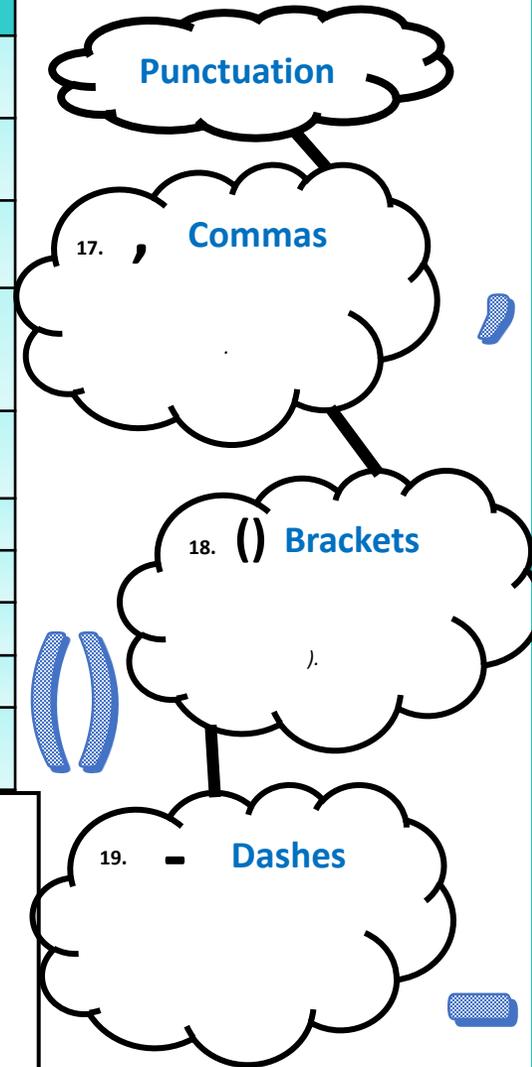
Pronoun

A word used in place of a noun

First person – includes yourself (*me, I, we, our, my*)
Second person – the person you are addressing (*you, your*)
Third person – Referring to people that are not present (*he, she, they, them, her, him*)

Year 9 English:

Vocabulary	Definition	Example
1. Tragedy		
2. Deception		
3. Conflict		
4. Allusion		
5. Patriarchy		
6. Prejudice		
7. Hubris		
8. Envy		
9. Honour		
10. Justice		



Grammar	11. <u>Adverbial</u>	12. <u>Fronted Adverbial</u>	13. <u>Prepositional Phrases</u>	14. <u>Definite Article</u>	15. <u>Pronoun</u>
				<u>Indefinite Article</u>	

Geography



Helping every person achieve things they never thought they could.

Year 9 Geography: Vulnerable Landscapes

Key Vocabulary

1	What is adaptation?	How plants and animals change their bodies to survive in different locations.
2	What is altitude?	The height of an object or point in relation to sea level or ground level.
3	What is climate change?	A long-term, large-scale change in the planet's average temperatures and weather patterns
4	What is a coral reef?	An underwater ecosystem, consisting of corals that create the reef. Coral are marine invertebrate, and reefs are ridges of jagged material just above or below the surface of the sea.
5	What are fold mountains?	Where two or more of Earth's tectonic plates are pushed together
6	What is mitigation?	To reduce or prevent the effects of something from happening.
7	What are plate tectonics?	The Earth's crust and upper part of the mantle are broken into large pieces called tectonic plates. These are constantly moving at a few centimetres each year and are known as plate tectonics.
8	What is a Sherpa?	A member of a Tibetan people living on the high southern slopes of the Himalayas in eastern Nepal and known for providing support for foreign trekkers and mountain climbers.
9	What is a storm surge?	A storm surge is a change in sea level that is caused by a storm. They can lead to extensive flooding and are dangerous for people living in many coastal areas.
10	What is tourism?	Tourism is when people travel away from home for pleasure.
11	What is a tsunami?	A series of extremely long waves caused by a large and sudden displacement of the ocean, usually the result of an earthquake below or near the ocean floor.
12	What do we mean by vulnerable?	A vulnerable landscape is an area which is at risk from natural or human damage. It could be permanent or temporary but will have a negative effect on the environment and its people.

13. Explain the formation of the Himalayan mountains.

- The Indian-Australian plate moved towards the Eurasian plate due to convection currents in the mantle.
- The plates smashed into each other.
- The land crumples and mountains starts to form.
- This continues to happen and the mountain grows.
- Mount Everest continues to grow today



Year 9 Geography: Vulnerable Landscapes

Key Vocabulary

1	What is adaptation?	
2	What is altitude?	
3	What is climate change?	
4	What is a coral reef?	
5	What are fold mountains?	
6	What is mitigation?	
7	What are plate tectonics?	
8	What is a Sherpa?	
9	What is a storm surge?	
10	What is tourism?	
11	What is a tsunami?	
12	What do we mean by vulnerable?	

13. Explain the formation of the Himalayan mountains.



Year 9 Geography: Vulnerable Landscapes

The location of the Maldives

How does tourism impact the Himalayas?

19. What four strategies are proposed by the Maldives and UNESCO to protect the islands?

14	What is a social impact of tourism on the Himalayas and the people who live there?	There have now been traffic jams of people on Mount Everest trying to reach the summit.
15	What is an economic impact of tourism on the Himalayas and the people who live there?	Tourism is a major source of income for many of the locals.
16	What is an environmental impact of tourism on the Himalayas and the people who live there?	Pollution has increased as people leave unwanted items along the mountain range.

1. Build sea walls around the most populated islands.
2. Build artificial (man-made) islands that are higher than the current natural islands.
3. Preserve mangrove forests and coral reefs.
4. Build more hotels to increase tourism to earn extra money to build man-made islands.

The location of the Maldives

17	<p>Describe the location of the Maldives</p> 	<p>The Maldives are located in the Indian Ocean in southern Asia. India is to the north of the Maldives and Somalia is to the west. The Maldives are located just above the equator.</p>
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Why are the Maldives vulnerable?

18	What makes the Maldives a vulnerable landscape?	<ul style="list-style-type: none"> • The Maldives are 1600 km from the nearest country - India. • Due to the Maldives location in the Indian Ocean, there is little protection from major storms. • The Maldives are very low lying islands that are expected to be submerged in the future. 	83
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Year 9 Geography: Vulnerable Landscapes

The location of the Maldives

How does tourism impact the Himalayas?

19. What four strategies are proposed by the Maldives and UNESCO to protect the islands?

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What is a social impact of tourism on the Himalayas and the people who live there?

15

What is an economic impact of tourism on the Himalayas and the people who live there?

16

What is an environmental impact of tourism on the Himalayas and the people who live there?

The location of the Maldives

17

Describe the location of the Maldives



Why are the Maldives vulnerable?

18

What makes the Maldives a vulnerable landscape?

Year 9 Geography: Globalisation

Key Vocabulary



1	What is air freight?	The carriage of goods by air.
2	What is containerisation?	A system of transportation to carry goods around the world in containers.
3	What do we mean by de-industrialised?	The reduction of manufacturing within an economy.
4	What is digital workplace?	The digital workplace is a work environment which will be dominated by new communications technology. It means workers will collaborate over the internet from many places around the world and some people may never meet these colleagues in person or leave their home office for work.
5	What is a franchise?	A type of agreement that entails reproducing a successful business model across multiple locations.
6	What is globalisation?	The increasing connections between places and people across the planet, established through trade, politics and cultural exchanges, and helped by technology and transport
7	What do we mean by industrialised?	The transformation of economies to those that are dominated by manufacturing and services.
8	What is Panamax?	The maximum ship size that can transit the Panama Canal.
9	What is post-Panamax?	Ships larger than Panamax that do not fit in the original canal locks.
10	What is a production base?	The total national industrial production capacity available for the manufacture of items to meet materiel requirements.
11	What is a transnational corporation?	A company that is controlled from its home country but has large operations in many different countries
12	What is world trade?	The purchase and sale of goods and services by companies in different countries

Year 9 Geography: Globalisation

Key Vocabulary



1	What is air freight?	
2	What is containerisation?	
3	What do we mean by de-industrialised?	
4	What is digital workplace?	
5	What is a franchise?	
6	What is globalisation?	
7	What do we mean by industrialised?	
8	What is panamax?	
9	What is post-panamax?	
10	What is a production base?	
11	What is a transnational corporation?	
12	What is world trade?	

Year 9 Geography: Globalisation



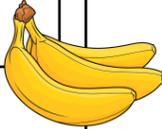
Introduction to Globalisation

13	<p>What are the advantages of globalisation?</p>	<ol style="list-style-type: none"> Life expectancy in many developing countries has risen to over 70 years old. Since 1990, the population of developing countries living in extreme poverty has halved to 21% We have seen the fastest reduction in poverty in human history, this coincides with rising levels of global trade and investment.
14	<p>What are the disadvantages of globalisation?</p>	<ol style="list-style-type: none"> 1.4 billion people still live in poverty, both in rural areas and slums of cities. Polluting industries have moved from Europe and North America to Asia and Africa. <p>and Africa endure hard working conditions for low pay.</p>

Losers of Globalisation

16	<p>Who are the winners of globalisation?</p>	<ul style="list-style-type: none"> Workers who are able to move to higher income countries. Multinationals who gain from tax avoidance and outsourcing cheaper labour. Educated skilled workers who have power to gain higher wages. Families who receive remittance money from relative working in global industries e.g. shipping crews.
17	<p>Who are the losers of globalisation?</p>	<ul style="list-style-type: none"> Land-locked countries unable to develop exporting industries. Countries who suffer from a 'brain drain' as skilled workers move abroad and leave e.g. scientists, doctors, teachers. Manufacturing detector in high labour cost countries. Structural unemployment amongst former manual workers due to lack of training in tertiary jobs.

How bad are bananas?

	<p>What do we mean by a carbon footprint?</p>	<p>The amount of carbon dioxide released into the atmosphere as a result of the activities of a particular individual, organisation, or community</p> <p>This is measured in CO₂e or Carbon Dioxide equivalents</p>
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TNC Case studies

15	<p>How does cotton production have a negative impact on the Aral Sea?</p>	<p>Global demand for cotton means that the farms around the Aral Sea need massive volumes of water. They have been draining the sea for 50 years and it is now around 1/5th of its original size. The fertilisers and pesticides which have washed from the farms have crystallised with the salts of the former sea creating a toxic poisoning dust which blows into the towns and villages causing lung diseases and cancers.</p>
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TNC Case studies

19	<p>What are the positives of a digital workplace?</p>	<ul style="list-style-type: none"> Lower operating costs as you need to pay for less offices, meals, hotel stays, flights etc. Increased collaboration from around the world bringing more experts together. More profits into your business meaning more tax income for governments. Better for the environment as less travel is reducing air/noise/water pollution.
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Year 9 Geography: Globalisation



Introduction to Globalisation

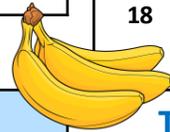
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14	What are the disadvantages of globalisation?	

Losers of Globalisation

16	Who are the winners of globalisation?	
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How bad are bananas?

18	What do we mean by a carbon footprint?	
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TNC Case studies

15	How does cotton production have a negative impact on the Aral Sea?	
----	--	--



TNC Case studies

19	What are the positives of a digital workplace?	
----	--	--

Year 9 Geography: Natural Hazards

Key Vocabulary

1	What is a volcano?	A vent at the surface of the earth, through which magma and other volcanic materials are ejected
2	Define 'Immediate responses'	The reaction of people as the disaster happens and in the immediate aftermath
3	Define 'Long-term responses'	Later reactions that occur in the weeks, months and years after the event
4	Define 'Monitoring'	Recording physical changes to help forecast when and where a natural hazard might strike
5	Define 'Planning'	Actions taken to respond to, and recover from, natural disasters
6	Define 'Prediction'	Attempts to forecast when and where a natural hazard will strike
7	What is a 'Primary effects'?	The initial impact of a natural event on people and property
8	Define 'Protection'	Actions taken before a hazard strikes to reduce its impact
9	What is a 'Secondary effect'?	The after-effects that occur as indirect impacts of a natural event
10	What is 'Subduction'?	A process occurring at destructive plate margins where a heavier oceanic plate is forced under a continental plate
11	What is a 'Tectonic hazard'?	A natural hazard caused by movement of tectonic plates

Plate Margins:

12	Describe the plate movement at the following plate margins:	<ul style="list-style-type: none"> • Conservative: plates move past each other • Destructive: plates move towards each other and one is subducted • Constructive: plates move away from each other
	<ul style="list-style-type: none"> • Conservative • Destructive: • Constructive: 	

Plate Tectonics Theory:

13	Name the four layers of the earth	Inner core, outer core, mantle and crust
14	What are the pieces of crust called?	Crust pieces are called tectonic plates
15	Where do convection currents happen?	Convection currents cause magma to move in circular movements
16	What do convection currents cause?	Convection currents cause tectonic plates to move

Volcano case study: Tonga

17	Describe the location of Tonga	Tonga is in the southern hemisphere. It is located in the Australian continent in the southern part of the Pacific Ocean. It is located to the west of Australia and north of New Zealand.
		

Types of volcanoes

18	Describe the characteristics of shield volcanoes and composite volcanoes		
	<table border="0"> <tr> <td> Shield Volcano <ul style="list-style-type: none"> • Very little explosive activity • Runny lava • Gentle, sloping sides • Lava travels long distances before it cools </td> <td> Composite Volcano <ul style="list-style-type: none"> • Violent eruptions • Steep sides • Sticky lava which doesn't travel far • Alternate layers of ash and lava, also known as stratovolcanoes </td> </tr> </table>	Shield Volcano <ul style="list-style-type: none"> • Very little explosive activity • Runny lava • Gentle, sloping sides • Lava travels long distances before it cools 	Composite Volcano <ul style="list-style-type: none"> • Violent eruptions • Steep sides • Sticky lava which doesn't travel far • Alternate layers of ash and lava, also known as stratovolcanoes
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Management of Tectonic Hazards:

19	How do people plan for tectonic hazards?	Hazard maps showing areas at risk
20	How do people predict tectonic hazards?	Measuring sulfur from volcano Seismometers measure vibrations
21	How can buildings be protected from tectonic hazards?	Earth embankments divert lava Earthquake resistant buildings

Living with risk:

22	What kind of energy can be generated by volcanoes?	Geothermal energy to power homes and industry
23	What might attract tourists to risky areas?	Dramatic scenery attracts tourists
34	How is volcanic ash useful?	Lava and ash deposits provide valuable nutrients for soil

Year 9 Geography: Natural Hazards

Key Vocabulary

1	What is a volcano?	
2	Define 'Immediate responses'	
3	Define 'Long-term responses'	
4	Define 'Monitoring'	
5	Define 'Planning'	
6	Define 'Prediction'	
7	What is a 'Primary effects'?	
8	Define 'Protection'	
9	What is a 'Secondary effect'?	
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Volcano case study: Tonga

17	Describe the location of Tonga 	
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Types of volcanoes

18	Describe the characteristics of shield volcanoes and composite volcanoes 	
	Shield Volcano	Composite Volcano

Management of Tectonic Hazards:

19	How do people plan for tectonic hazards?	
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Living with risk:

22	What kind of energy can be generated by volcanoes?	
23	What might attract tourists to risky areas?	
34	How is volcanic ash useful?	

Key Vocabulary

1	What is Development?	The progress of a country as it becomes more economically and technologically advanced
2	What is 'International trade'?	Trade between different countries
3	What is 'Migration'?	Migration is the movement from one place to another
4	What are natural resources?	Materials from the Earth that are used to support life and meet people's needs
5	Define 'rural environments'	Rural environments refer to the countryside
6	Define 'urban environments'	Urban environments refer to towns and cities
7	What are push factors?	Something that pushes you away from a place or country
8	What are pull factors?	Something which pulls you towards a place or country
9	What do we mean by 'border control'?	Actions taken by a country or a group of countries to monitor the borders and regulate the cross-border movements of people, goods and animals
10	What are refugees?	People who must leave their home area for their own safety or survival
11	What do we mean by 'geopolitics'?	Politics that are influenced by geographical factors.

Prisoners of geography:

12	Why is geopolitical power uneven?	<ul style="list-style-type: none"> Advanced countries have the wealth and strong state apparatus to control international trade and migration. Organisations such as the EU have greater power. Emerging and developing countries are becoming increasingly powerful. Low income developing countries have less money, access and control and so have little power. TNCs (transnational cooperation) are increasingly important.
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The Russian conflict:

13	Name one geographical reason for the conflict between Russia and Ukraine	One specific geographical reason that may have played a role in Russia's invasion of Ukraine is the Crimean Peninsula. Crimea is a strategically important region as it provides Russia with a warm-water port in the Black Sea and access to important oil and gas pipelines that run through Ukraine.
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Build that wall:

14	Name 3 push factors and 3 pull factors causing Syrians' to migrate to Europe	
	<p>Push Factors</p> <ul style="list-style-type: none"> Civil war Unemployment due to civil war Lack of food due to civil war 	<p>Pull Factors</p> <ul style="list-style-type: none"> Safe and secure shelter A reliable source of food Availability of public services such as education and healthcare

Global superpowers:

16	What is a geographical superpower?	A superpower is a state with a dominant position characterized by its extensive ability to exert influence or project power on a global scale . This is done through the combined means of economic, military, technological and cultural strength as well as political and soft power influence.
17	When was the word 'superpower' first used?	The word superpower was first used after the second world war to refer to the USA, the British Empire and the USSR.

Russia:

15	What natural resources does Russia have?	Russia is probably richer in natural resources than any other country in the world. It has abundant supplies of oil, natural gas, timber and valuable minerals, such as copper, diamonds, lead, zinc, bauxite, nickel, tin, mercury, gold and silver— most of which are located in Siberia and the Far East. The value of Russia's resources is huge.
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Key Vocabulary

1	What is Development?	
2	What is 'International trade'?	
3	What is 'Migration'?	
4	What are natural resources?	
5	Define 'rural environments'	
6	Define 'urban environments'	
7	What are push factors?	
8	What are pull factors?	
9	What do we mean by 'border control'?	
10	What are refugees?	
11	What do we mean by 'geopolitics'?	

Prisoners of geography:

12	Why is geopolitical power uneven?	
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The Russian conflict:

13	Name one geographical reason for the conflict between Russia and Ukraine	
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Build that wall:

14	Name 3 push factors and 3 pull factors causing Syrians' to migrate to Europe	
	<u>Push Factors</u>	<u>Pull Factors</u>

Global superpowers:

16	What is a geographical superpower?	
17	When was the word 'superpower' first used?	

Russia:

15	What natural resources does Russia have?	
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Year 9 Geography: Rocks & Soil

Key Vocabulary

1	What is a 'fossil'?	The remains or impression of a prehistoric plant or animal embedded in rock and preserved in petrified form
2	What is a Palaeontologist?	Someone who studies ancient life such as dinosaurs, plants, microbes or fungi.
3	What is erosion?	The gradual destruction or diminution of something.
4	What is a Rock?	The solid mineral material forming part of the surface of the earth
5	What does permeable mean?	Allowing liquids or gases to pass through it.
6	What does impermeable mean?	Not allowing liquids or gases to pass through.
7	What does rock hardness mean?	How strong a rock is and the force required to damage it.
8	What is rock durability?	How resistant a rock is to weathering.
9	What is rock density?	How tightly packed the molecules making up a rock are.
10	What is soil?	The upper layer of earth in which plants grow.
11	What is desertification?	the process by which fertile land becomes desert

Types of Rocks:

12	Type of Rock	Formation, Properties & Examples
	Sedimentary	-Formed by layers of sediment which settle and are compacted. -Weak and easy to break -Sandstone or Limestone
	Igneous	-Formed by magma cooling down. -Hard and often include crystals. -Obsidian
	Metamorphic	-Formed by pressure and heat causing chemical changes. -Highly resistant to erosion. -Marble

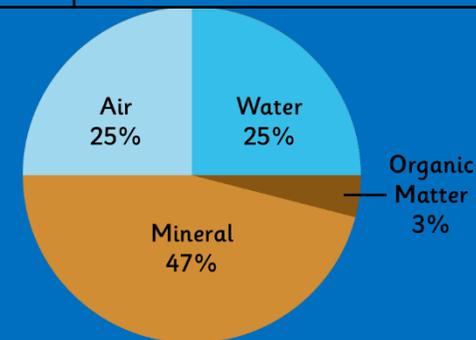
Fossils:

13	Why are fossils important?	Fossils allow us to infer how a creature evolved, how it lived and what it looked like.
	Why do not all creatures leave fossils?	Fossils require certain conditions for a long time and creatures with hard parts like shells or skeletons have a higher chance.
	What are the limitations of fossils?	Not all fossils are complete and many animals don't leave them. And no-one can say for certain how an animal lived if no-one ever saw it.

Mary Anning & Palaeontology:

14	Fossil Type:	What is it?
	Trace Fossil: 	A fossil of a footprint, trail, burrow, or other trace of an animal rather than of the animal itself.
	Body Fossil: 	The remains of the body parts of an ancient animal, plant, or other life form, usually of hard parts such as bones, teeth, shells, or wood
	Chemical Fossil: 	Any of various organic compounds found in ancient geological strata that appear to be biological in origin and are assumed to indicate that life existed when the rocks were formed

15	Who was Mary Anning?	Mary Anning was a palaeontologist who made ground-breaking fossil discoveries but because she was a woman she never received the credit she deserved.
16		What are the main components of soil?



Year 9 Geography: Rocks & Soil

Key Vocabulary

1	What is a 'fossil'?	
2	What is a Palaeontologist?	
3	What is erosion?	
4	What is a Rock?	
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Types of Rocks:

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	Igneous	
	Metamorphic	

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Mary Anning & Palaeontology:

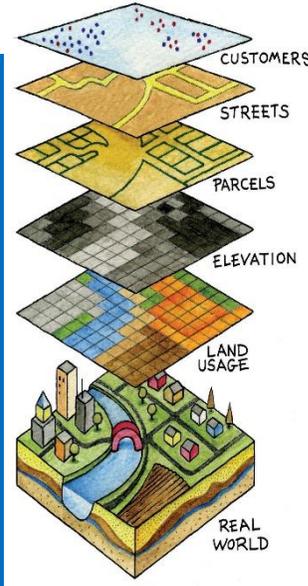
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	Body Fossil: 	
	Chemical Fossil: 	

15	Who was Mary Anning?	
16		What are the main components of soil?

Year 9 Geography: GIS

Key Vocabulary

1	What is a map?	A two-dimensional drawing of an area. Maps can show the countryside, a town, a country or even the whole world.
2	What is GIS?	a system that creates, manages, analyses, and maps all types of data
3	What is a land use map?	A map showing what land is being used for using different colours.
4	What is a political map?	A map that shows the borders of nations/regions, major cities and capitals.
5	What is a cartogram?	A map that alters the size of an area to match the data shown. Used to visualise data.
6	What is a Choropleth map?	A map that shades or colours areas based on data and show how this data changes from place to place without distorting the shape
7	What is a relief map?	Maps that show the physical or natural landscape features of the Earth.



13	Why do we use GIS?	Land management Logistics management Tracking Town planning Identifying sites for construction Mapping crime Locating and targeting customers Resource management.
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What are the advantages and disadvantages of GIS technology?		
14	Advantages	Disadvantages
	<ul style="list-style-type: none"> GIS allows geographical data to be clearly displayed. It allows you to handle a vast amount of data. It allows you to use a wide range of data. It makes planning more efficient and effective. 	<ul style="list-style-type: none"> GIS software is very expensive. GIS is complex and hard to use GIS requires a lot of data to be effective. It cannot use all types of data such as qualitative data.

What is GIS:

12	What does GIS stand for and what is a GIS map made of?	G - Geographic I - Information S - System Different layers of data stacked on top of each other like a cake. Layers can be applied individually or in any combination to show information.
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Mapping Nature:

15	Why do we map flora and fauna?	To track and understand animal movements and behaviour
		To protect people from possibly dangerous wildlife.
		To protect endangered species.
		To see the effects of climate change on the natural environment and animals.
		To determine if an area can be used for development.

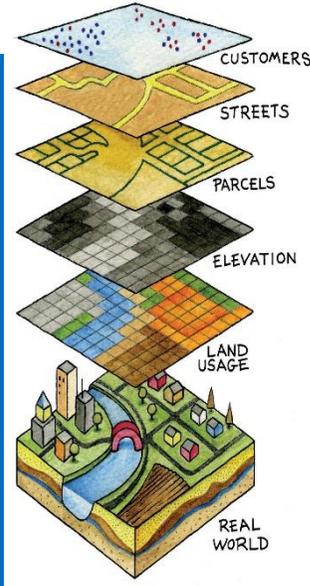
Future of GIS:

16	Who uses GIS?	GIS is used by every industry: <ul style="list-style-type: none"> Police use GIS to map crime patterns and behaviour. Businesses use GIS to track the market and identify sites. Governments use GIS to identify areas for development & to show census data.
17	Why is GIS becoming more important?	There is now much more data being collected and capacity to share and store more. Much of this data is geographical such as the data from smart cars.

Year 9 Geography: GIS

Key Vocabulary

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2	What is GIS?	
3	What is a land use map?	
4	What is a political map?	
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7	What is a relief map?	



13	Why do we use GIS?	
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14	What are the advantages and disadvantages of GIS technology?	
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Mapping Nature:

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Future of GIS:

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What is GIS:

12	What does GIS stand for and what is a GIS map made of?	
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History



Helping every person achieve things they never thought they could.

Year 9 History:



Topic	Question	Answer
End of World War I	1 Which COUNTRIES are referred to as 'the big three?'	USA, Great Britain and USSR
	2 How did Hitler kill himself?	Hitler took poison capsules and shot himself.
	3 Which LEADERS were in charge of the Big Three when Germany surrendered?	Roosevelt, Churchill, Stalin
	4 Why did USA begin to distrust the USSR?	USA thought USSR was spreading Communism in Europe
	5 Why did USSR begin to distrust USA?	They wondered why America had kept the atom bomb a secret from them.
Intro to Cold War	6 What was the Cold War?	A rivalry between USA and USSR from 1945-1990
	7 What is Capitalism?	A system where goods and property are owned privately.
	8 What is Communism?	A system where goods and property are owned by the state.
	9 What is a superpower?	A very powerful and influential country e.g. USA or USSR
Arms Race and Propaganda	10 What is an arms race?	Where countries compete to build up weapons.
	11 How many times have atom bombs been used in war?	Twice - USA attacked Hiroshima and Nagasaki in 1945
	12 What does M.A.D. stand for?	Mutually Assured Destruction
	13 What is an ICBM?	A missile that can be fired from ground rather than dropped from a plane.

Year 9 History:



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	12 What does M.A.D. stand for?	
	13 What is an ICBM?	

Year 9 History:



Topic	Question	Answer
Berlin Blockade and airlift	14 How were Germany and Berlin controlled after World War II	They were divided in to 4 zones each. (American, British, French and Soviet).
	15 Who succeeded Roosevelt in becoming America President?	Harry S Truman
	16 Why did Stalin blockade Berlin?	He felt threatened by USA, Britain and France joining their zones.
	17 What did Stalin hope to accomplish by blockading Berlin?	Stalin hoped the allies would give him complete control of Berlin.
	18 What did the blockade end?	The allies airlifted supplies into Berlin and Stalin did not want to start a war
Berlin Wall	19 Which 3 countries had joined their zones in Germany?	USA, Great Britain and France
	20 Why was West Berlin more prosperous than the East?	America had invested lots of money in it.
	21 Why did USSR SAY it built the Berlin Wall?	To stop Western agents entering the East
	22 Why did USSR really build the Berlin Wall?	To stop Eastern citizens from leaving



Topic	Question	Answer	
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Topic	Question	Answer
Korean War	23 What is domino theory?	If one country was allowed to fall to communism, then communism could quickly spread to neighbouring countries
	24 Who supported North Korea's invasion of the South?	China and USSR
	25 Who joined the war to help South Korea?	United Nations (mostly USA)
	26 How did the Korean War end?	With Korea divided into two countries.
	27 What is the line that separates North and South Korea	38th Parallel
Cuban Missile Crisis	28 Why was USA threatened by the island of Cuba?	Cuba had turned Communist under Fidel Castro
	29 Why did Cuba feel threatened by USA?	USA had unsuccessfully tried to overthrow the Communist regime with the Bay of Pigs fiasco.
	30 What started the Cuban Missile Crisis?	USA spy planes spotted nuclear missile sites in Cuba
	31 What made the Cuban Missile Crisis worse?	Soviet ships were spotted carrying nuclear missiles to Cuba.
	32 How did the crisis end?	USA placed a 'quarantine' around Cuba, whilst talking to USSR in private.



Topic	Question	Answer	
Korean War	23	What is domino theory?	
	24	Who supported North Korea's invasion of the South?	
	25	Who joined the war to help South Korea?	
	26	How did the Korean War end?	
	27	What is the line that separates North and South Korea	
Cuban Missile Crisis	28	Why was USA threatened by the island of Cuba?	
	29	Why did Cuba feel threatened by USA?	
	30	What started the Cuban Missile Crisis?	
	31	What made the Cuban Missile Crisis worse?	
	32	How did the crisis end?	

Year 9 History:

Topic	Question	Answer
Vietnam War	33 Why did USA become involved in the Vietnam War?	To prevent the spread of Communism. (Domino Theory)
	34 Which incident led to USA sending troops to Vietnam	An American warship patrolling the North Vietnamese coast was allegedly fired on by Communist troops. (The Gulf of Tonkin Incident).
	35 Who did the USA fight in Vietnam?	The Viet Cong (Communist guerrillas)
	36 Who type of tactics did Viet Cong use?	Guerrilla tactics - ambush, traps, tunnels, snipers, hit and run.
	37 Why was the Vietnam war unpopular back in the USA	Many saw negative reports on TV, which led to anti war movements and protests.
End of the Cold War	38 Who was appointed USSR's youngest ever leader in 1985?	Mikhail Gorbachev
	39 What problems did USSR face in the 1980s?	Low standard of living, no freedom of speech, high cost of war and defence, environmental and health problems.
	40 What was Glasnost?	Free speech, more openness and free elections in Russia.
	41 Why is Gorbachev seen as a hero in the USA?	He is seen as ending the Cold War
	42 Why was Gorbachev seen as a failure in Russia?	Rising prices, falling wages, unemployment, crime and black markets appeared. The USSR also fell apart

Year 9 History:

Topic	Question	Answer
Vietnam War	33 Why did USA become involved in the Vietnam War?	
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	41 Why is Gorbachev seen as a hero in the USA?	
	42 Why was Gorbachev seen as a failure in Russia?	

Year 9 History:

Question	Answer	Question	Answer
What does franchise mean?	The right to vote in public elections	What does abolitionist mean?	A person who favours the abolition (ending) of a movement or practice.
Why were people unhappy with the voting system?	Only land owning men could vote. Working class people felt their needs were not being met.	What do the Suffragettes want?	For women to have the right to vote.
What does secret ballot mean?	When voting is done in secret, people do not know who you are voting for	Who was the leader of the Suffragette movement?	Emily Pankhurst
Which radical gave a speech at Peterloo, Manchester	Henry Hunt	What does strike mean?	A refusal to work as a form of protest.
What is the Peterloo massacre?	At a peaceful protest, the militia killed 15 people and wounded 600	When was the General strike in Britain?	1926
Who are the Chartists?	Working class men campaigning for the right to vote	Who was the leader of the British Union of Fascists?	Oswald Mosley
What are the 1815 Corn Laws?	Law passed to keep the price of wheat high.	Define communism	State owns and controls businesses. No freedom during elections, no freedom of the press or religion.

Year 9 History:

Question	Answer	Question	Answer
What does franchise mean?		What does abolitionist mean?	
Why were people unhappy with the voting system?		What do the Suffragettes want?	
What does secret ballot mean?		Who was the leader of the Suffragette movement?	
Which radical have a speech at Peterloo, Manchester		What does strike mean?	
What is the Peterloo massacre?		When was the General strike in Britain?	
Who are the Chartists?		Who was the leader of the British Union of Fascists?	
What are the 1815 Corn Laws?		Define communism	

Year 9 History:

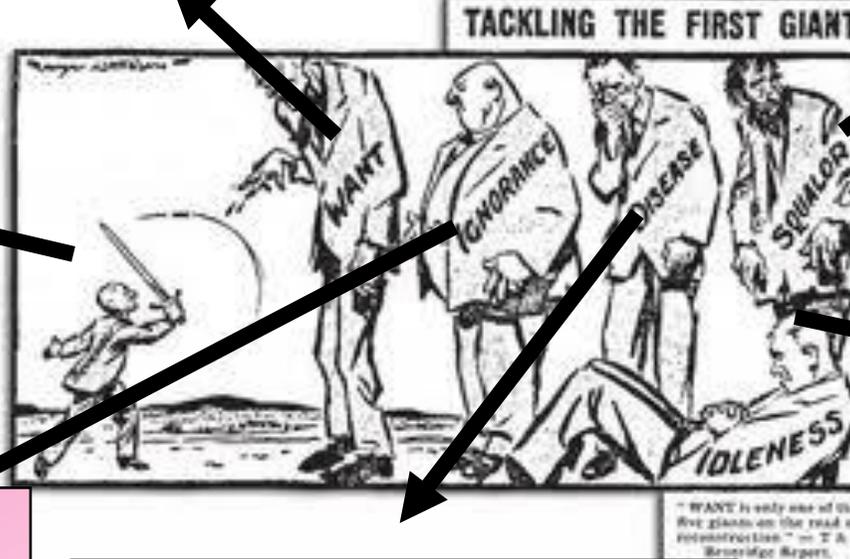
Want:

Extreme poverty was the result for many families who could not afford the necessities of everyday life. This was the outcome of ill health and unemployment which meant the household income was very little.

Squalor:

Most of the population were living in slums and house prices exceeded the income of many families.

Sir William Beveridge, who was a senior Civil Servant. He published his findings in 1942, the Beveridge report identified 5 Giant Evils in the country that needed to be addressed!



Ignorance:

The school leaving age in the 1900s was just 14. Many young people were unemployed, and the majority could not afford to pay for higher education.

Disease:

Diseases were becoming widespread and there was little help available through hospitals as they were all private and had cost implications.

Idleness:

Unemployment levels had become very high due to the little and poor education many people received and the very few jobs available after the war.

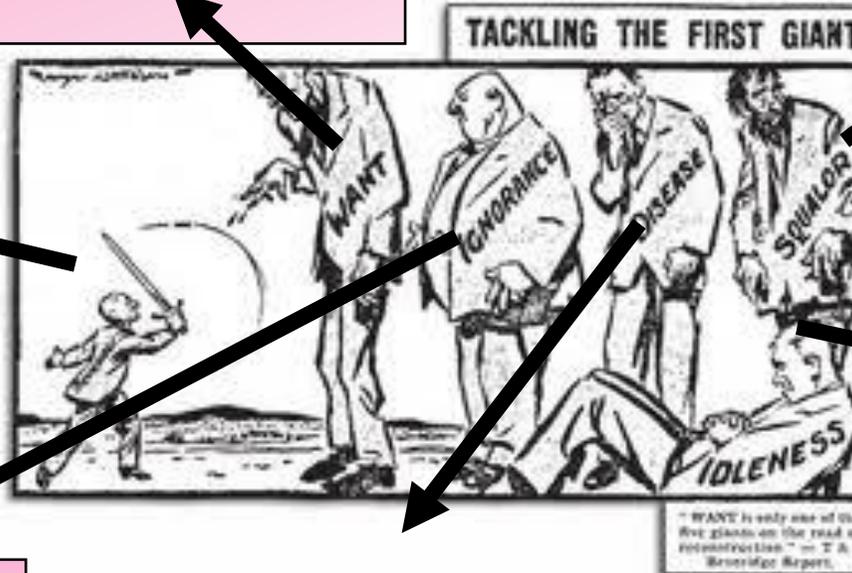
Year 9 History:

Want:

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Squalor:

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Disease:

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Idleness:

_____ levels had become very high due to the little and _____ education many people received and the _____ few _____ available after the war.

Year 9 History: The road to the Welfare State

WW1 brought to the forefront how bad conditions were in British society. Issues with housing, slum areas, lack of job opportunities and the education system needed improving. The wartime government were focused on the war effort, whereas the Labour Party were focused on building upon Beveridge's recommendations



There was a shock landslide election result in July 1945, when wartime prime minister **Winston Churchill** lost to **Labour's Clement Attlee**, who campaigned for the creation of the Welfare State.

Question	Answer
After WW1, what did David Lloyd George promise?	Homes fit for hero's- but many people could not afford these houses and continued to live in poor conditions.
What did the evacuation process of WW2 highlight?	The difference in rich and poor communities/families.
What impact did WW2 have on housing?	The Blitz destroyed many housing areas and drew attention to the poor conditions people had been living in.
Between 1945-51 how many houses did the Labour government build?	800,000
What was the 1945 New Towns Act?	Building of towns near cities.
What did the 1961 – Homes for Today and Tomorrow report set out?	Gave specific standards of housing, including adequate heating, flushing toilet, and enough space inside and outside.
Who was the Labour minister for Health?	Aneurin Bevan

Year 9 History: The road to the Welfare State

___ brought to the forefront how ___ conditions were in British _____. Issues with housing, ___ areas, lack of ___ opportunities and the education system needed improving.

The _____ government were focused on the ___ effort, whereas the Labour _____ were focused on building upon Beveridge's recommendations



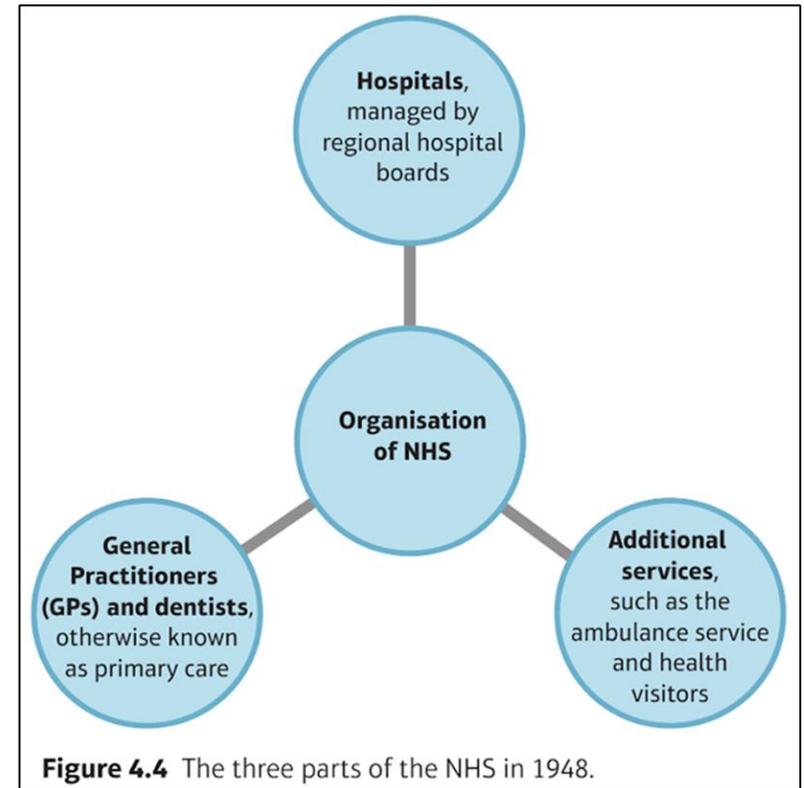
There was a _____ landslide election result in _____, when wartime prime _____ **Winston Churchill lost to Labour's Clement Attlee**, who campaigned for the creation of the _____ State.

Question	Answer
After WW1, what did David Lloyd George promise?	
What did the evacuation process of WW2 highlight?	
What impact did WW2 have on housing?	
Between 1945-51 how many houses did the Labour government build?	
What was the 1945 New Towns Act?	
What did the 1961 – Homes for Today and Tomorrow report set out?	
Who was the Labour minister for Health?	

Year 9 History:



Question	Answer
What does NHS stand for?	National Health Service
When was the NHS set up?	1948
In 1947, doctors gave out 7 million prescriptions, how many did they give out in 1951?	19 million
Who was prime minister when the NHS opened?	Clement Attlee (Labour party)
What was the budget of the NHS when it opened in 1948?	£437 million
When did the conservatives come back into power?	1951
Why did the Conservatives not get rid of the NHS?	It was too popular
Between what years did the number of NHS doctors double?	1948 and 1973
In 1948 how did life expectancy for a woman and man increase from 1948?	Women has raised from 66 to 83 and for men 64 to 79
How is the NHS paid for?	Through taxes

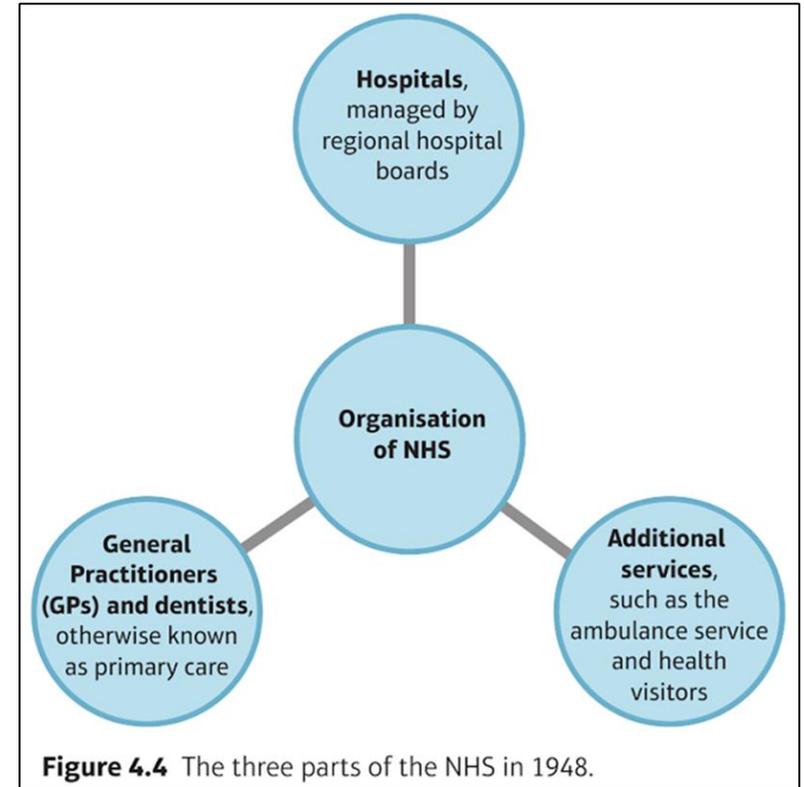


The creation of the NHS led to a massive recruitment campaign for doctors and nurses to help staff it. Many people came from different counties to work in the NHS.

Year 9 History:



Question	Answer
What does NHS stand for?	
When was the NHS set up?	
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The creation of the _____ led to a massive recruitment campaign for doctors and _____ to help _____ it.
 Many _____ came from different _____ to work in the NHS.

Year 9 History: Immigration to Britain

Question	Answer
Groups who come and settle to Britain from 1945-1975	Ireland, eastern Europe, Africa, the Caribbean, Hong Kong, Malaysia, Singapore and The Indian subcontinent
Why was it difficult for an immigrant to get accommodation?	Immigrants had to live in Britain for 5 years before they could apply for council accommodation, it was usually a room in a house, cramped and expensive.
Name the landlord in London who had over 100 properties overcrowded with immigrants?	Peter Rachman
Give a reason why immigrants faced discrimination?	Faced accusations that they were just in Britain for the benefit system
In 1955 transport workers in Wolverhampton, West Bromwich and Bristol went on strike to protest about what?	Increasing numbers of coloured workers (there was only ONE India bus conductor in West Bromwich)
Immigrants tended to stick together, name places where communities formed	Toxteth in Liverpool, Notting hill in London, Saint Pauls in Bristol, and Moss Side in Manchester became Caribbean communities with a life and culture of their own.
Who set up the Union Movement with the 'Keep Britain white' logo?	Oswald Moseley
What was the year of the summer of violence?	1958

Key Word	Definition
Immigration	Coming to live permanently in a foreign country
Migrant	A person who moves from one place to another, especially to find work or better living conditions
Push factor	something that makes people want to leave a place or escape from a particular situation
Pull factor	"pull" people to a new home and include things like better opportunities.
Nationality	The status of belonging to a particular nation.
Windrush	HMT Empire Windrush was a ship bringing people from the Caribbean to Britain



Year 9 History: Immigration to Britain

Question	Answer
Groups who come and settle to Britain from 1945-1975	
Why was it difficult for an immigrant to get accommodation?	
Name the landlord in London who had over 100 properties overcrowded with immigrants?	
Give a reason why immigrants faced discrimination?	
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Who set up the Union Movement with the 'Keep Britain white' logo?	
What was the year of the summer of violence?	

Key Word	Definition
Immigration	
Migrant	
Push factor	
Pull factor	
Nationality	
Windrush	



Year 9 History: Immigration Case Study: Windrush

Question	Answer
What does Windrush mean?	HMT Empire Windrush was a ship which travelled from the Caribbean to Britain in 1948.
Why did people want to come to Britain?	Britain needed more workers to rebuild the country after World War Two.
What does voyage mean?	A long journey on a ship.
What was the 1948 Nationality Act?	Gave citizens of the United Kingdom and Colonies status and the right of settlement in the UK to everyone who was at that time a British subject by virtue of having been born in a British colony.
What does citizenship mean?	The position or status of being a citizen of a particular country
What does discrimination mean?	The unjust or prejudicial treatment of different categories of people, especially on the grounds of ethnicity, age, sex, or disability



Question	Answer
Between 1948 and 1971 how many people moved from the Caribbean to Britain?	Half a million people
How did Britain encourage people to move over?	Used adverts (propaganda)
Why did people from the Caribbean feel they were being treated differently?	Due to the colour of their skin
When did the Windrush scandal begin?	2018
What is the Windrush scandal?	People who were wrongly detained, denied legal rights, threatened with deportation, and in at least 83 cases wrongly deported from the UK by the Home Office.

Year 9 History: Immigration Case Study: Windrush

Question	Answer
What does Windrush mean?	
Why did people want to come to Britain?	
What does voyage mean?	
What was the 1948 Nationality Act?	
What does citizenship mean?	
What does discrimination mean?	



Question	Answer
Between 1948 and 1971 how many people moved from the Caribbean to Britain?	
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When did the Windrush scandal begin?	
What is the Windrush scandal?	

Year 9 History:

The Troubles in Northern Ireland

Question	Answer
Define Nationalist	Wants independence from the United Kingdom
Define Unionist	Wants to keep the union between NI and England
What does segregation mean?	To separate- NI saw a separation between Protestants and Catholics
What is the parliament of Northern Ireland called?	Stormont
What year did the Troubles start?	1969
What does discrimination mean?	To treat someone differently/unfairly based on religion, race, gender etc.
What is the R.U.C?	Royal Ulster Constabulary (the police force)
What is a Loyalist?	Someone that wants to keep the union with England
What is a Republican?	Someone that wants a united Ireland
What does I.R.A stand for?	Irish Republican Army
What does internment mean?	Suspected terrorists could be arrested and kept in prison (interned) without trial.
What happened on Bloody Sunday 1972	13 unarmed Catholic civilians were killed
What is the Good Friday Agreement?	The peace document of 1998 that ended the Troubles



Year 9 History:

The Troubles in Northern Ireland

Question	Answer
Define Nationalist	
Define Unionist	
What does segregation mean?	
What is the parliament of Northern Ireland called?	
What year did the Troubles start?	
What does discrimination mean?	
What is the R.U.C?	
What is a Loyalist?	
What is a Republican?	
What does I.R.A stand for?	
What does internment mean?	
What happened on Bloody Sunday 1972	
What is the Good Friday Agreement?	



Life Chances



Helping every person achieve things they never thought they could.

Year 9 Life Chances: CEIAG (careers)

Technology is one of the biggest **influences** on the changing opportunities in the world of work.

- **Artificial intelligence (AI)** is the development of machines that can mimic human behaviours such as learning, reasoning and self-correction.
- **Robots** can help humans do physical tasks. Not all robots are physical robots. Robotic process automation (RPA) is software that can be configured to do specific tasks that humans do on computers.
- **Automation** are tasks done by machines instead of humans to increase efficiency and reduce mistakes.

800,000 jobs have been lost but nearly **3.5 million new ones have been created** due to technology.

Technology has boosted employment in knowledge-intensive sectors such as **medicine**, **accounting** and **professional services**.

Career or Job?

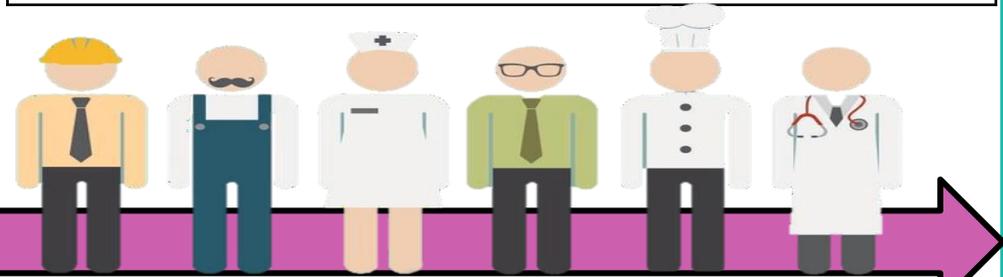
What is a job?

Your job is the role you have at your place of work. **Firefighter, airline pilot, teacher, politician** – these are all jobs.
In a nutshell, a job is about the here and now.

A job can be something you do just to earn money. But it can also be part of something much bigger. This is called a "career".

What is a career?

A career is about more than just earning a wage. It is to do with your long-term **aims** and **ambitions**, and what you want to achieve in your life.
In a career, each job you have helps you achieve this goal.
This is called your career path.



Your Journey Through Education...

Institution	Age	Year Group	Qualification	Level	Status
Primary School	4-11 years	Reception – Year 6	SATs (In year 6)	N/A	Compulsory
Secondary School	11-16 years	Year 7 – Year 11	GCSEs (taken in year 11)	Level 2	Compulsory
Further Education (College/Sixth Form)	16+	Year 12 – Year 13	A Levels / T Levels / BTECs / Apprenticeships	Level 3	Compulsory
Higher Education (University/College)	18+	Undergraduate	Degree / Foundation degree / Degree apprenticeships	Level 4 - 6	Optional

Year 9 Life Chances: CEIAG (careers)

Technology is one of the biggest **influences** on the changing opportunities in the world of work.

- **Artificial intelligence (AI)** is...
- **Robots** can...
- **Automation** are..

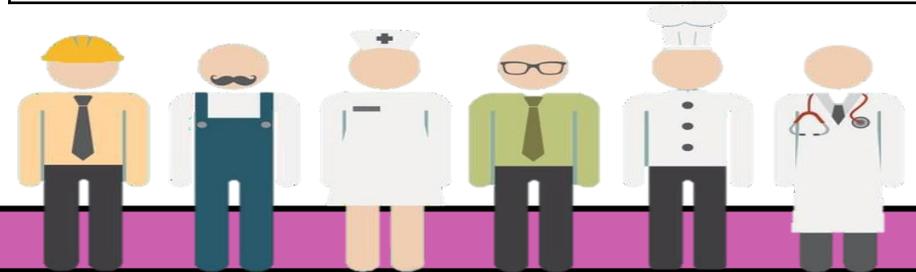
800,000 jobs have been lost but nearly _____ due to technology.

Technology has boosted employment in knowledge-intensive sectors such as _____, _____ and _____.

Career or Job?

What is a job?

What is a career?



Your Journey Through Education...

Institution	Age	Year Group	Qualification	Level	Status
	4-11 years	Reception – Year 6		N/A	
	11-16 years	Year 7 – Year 11		Level 2	
	16+	Year 12 – Year 13		Level 3	
	18+	Undergraduate		Level 4 - 6	

Year 9 Life Chances: Wellbeing

Healthy Living

What is a diet?

A diet is the type and range of food that you regularly eat.

A diet could be unhealthy or well-balanced.

It is all about the types of food someone chooses to eat and the roles different foods have on the body.

It is NOT a weight loss programme or type of food restriction.

How are children affected by food marketing?

- Product placement by the tills, often at child's level to get them interested at a young age.
- Offers such as buy one get one free are very tempting and can mean people eat more than they intended.
- Shops often price products cheaply, making them more convenient so that it's cheaper and easier to make fast food rather than fresh. E.g. Ready meals, fast food restaurants.
- Sending emails and text messages with offers e.g. Pizza hut.

Bowel

This needs fibre (roughage) to help it remove waste such as fats and toxins from your body.

Heart

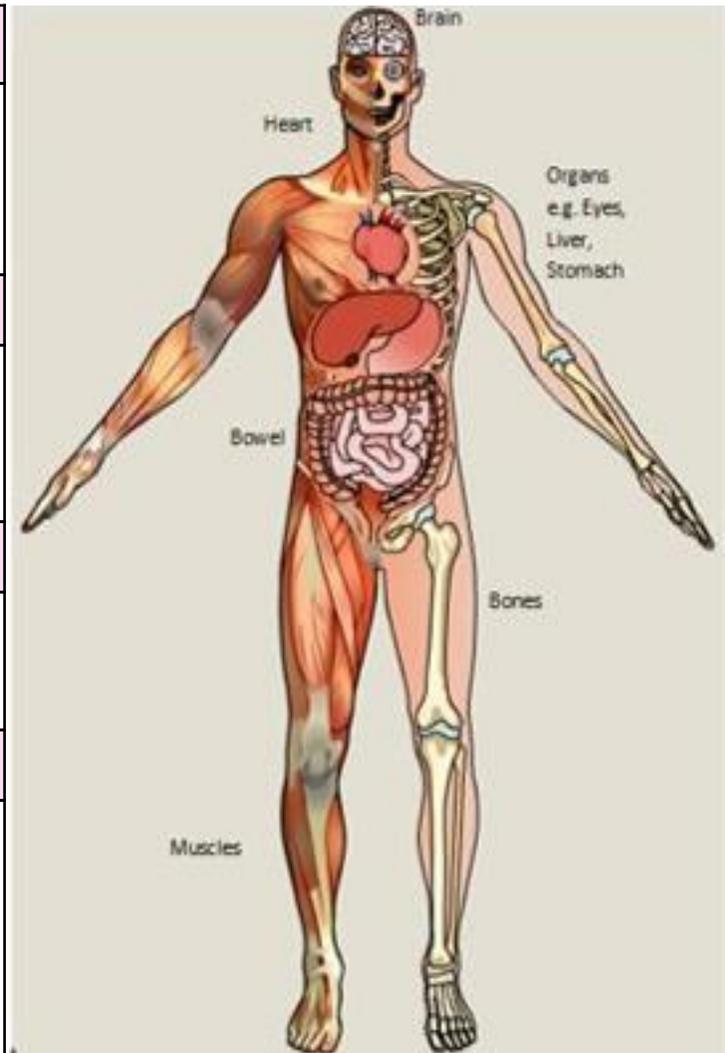
This needs certain types of fat to keep it healthy. Fat is also an essential source of energy.

Brain

This needs plenty of water to keep the body functioning properly

Muscles

These get most of their energy from carbohydrates. They also need protein in order for them to grow and repair themselves.



What does a healthy, balanced diet consist of?

A balance of the different nutrition groups

Proteins, Carbohydrates, Fats, Fibres, Vitamins, Minerals and Water.

Year 9 Life Chances: Wellbeing

Healthy Living

What is a diet?

How are children affected by food marketing?

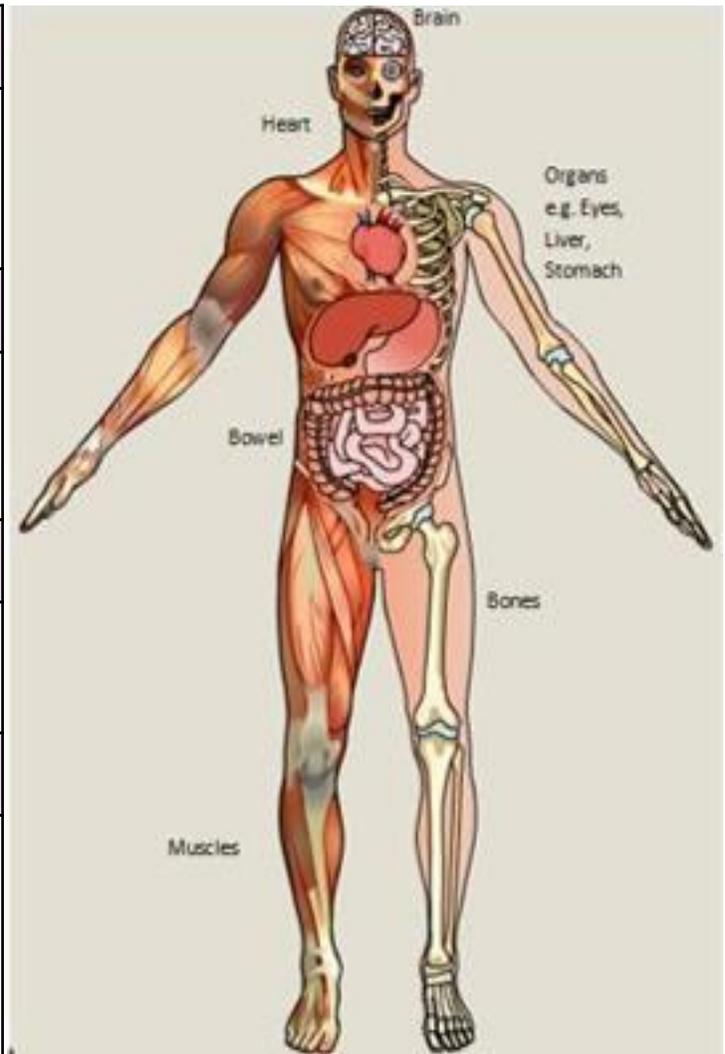
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What does the **bowel** need to remain healthy?

What does the **heart** need to remain healthy?

What does the **brain** need to remain healthy?

What do **muscles** need to remain healthy?



What does a healthy, balanced diet consist of?

Year 9 Life Chances: Wellbeing

Understanding the laws surrounding drugs.

Possession means...

Possession with intent to supply means...

Supply means...

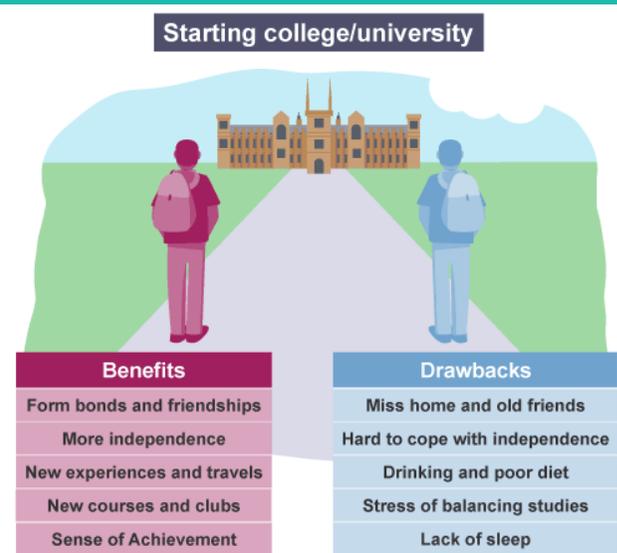


Drug	Effect 1	Effect 2
Depressants (E.G. Alcohol or solvents)		
Stimulants (E.g. MDMA or cocaine)		
Hallucinogens (E.g. Magic mushrooms or LSD)		
Dissociatives (E.g. Ketamine or nitrous oxide)		
Opioids (E.g. Heroin)		
Steroids (E.g. Anabolic steroids)		
Cannabinoids (E.g. Cannabis)		

Year 9 Life Chances: Further education

Going to University or College

Starting a university or college is like starting school but there are so many more people. You might be older, but it can still be a lonely and difficult experience. And yet, it can be a positive experience too.



Starting university is exciting. You are going to enjoy:

- new experiences
- clubs, societies, sports
- new, more sophisticated classes
- being more independent and confident
- forming bonds with other students
- the sense of achievement at having reached university
- meeting new friends

There **can be** some downsides too. You might:

- drink too much alcohol
- sleep poorly
- react badly to a change of diet
- be short of money
- find that striking a balance between study, work and socialising is difficult
- miss your family and school friends
- find it hard to cope with independence

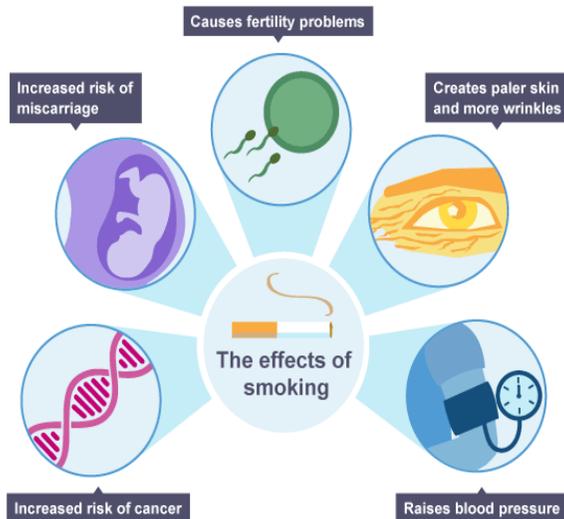
Year 9 Life Chances: Unhealthy lifestyle choices

Drug use

A drug is a chemical substance that affects the processes of the mind or body.

Some drugs are legal and can be bought in shops and supermarkets such as alcohol, cigarettes and mild painkillers. Others are medicines, prescribed by doctors to treat illnesses.

Illegal drugs are banned by the government.



Unhealthy lifestyle choices

Nicotine

Nicotine is another legal drug that is used as a mild stimulant and is consumed in cigarettes, cigars, pipes and vaporisers.

Smoking can have very bad side effects, including:

- high blood pressure, increasing the likelihood of heart attack and stroke;
- increased risk of cancers of the lungs, throat and mouth;
- lower fertility, making it difficult to conceive children;
- higher risk of miscarriage or stillbirth;
- premature aging due to reduced blood supply to the skin.

Alcohol

Alcohol such as beer, wine and spirits are legal to buy, only if you are over 18. Drinking large amounts can have the following effects:

- increase in aggression and violence;
- depression;
- slurred speech and unsteady movement;
- headaches and stomach ache (hangover);
- death from overdose.

Year 9 Life Chances: Unhealthy lifestyle choices

Drug use

A drug is a chemical substance that affects the processes of the _____ or _____.

Some drugs are legal and can be bought in shops and supermarkets such as _____, cigarettes and mild _____. Others are _____, prescribed by doctors to treat illnesses. Illegal drugs are banned by the _____.

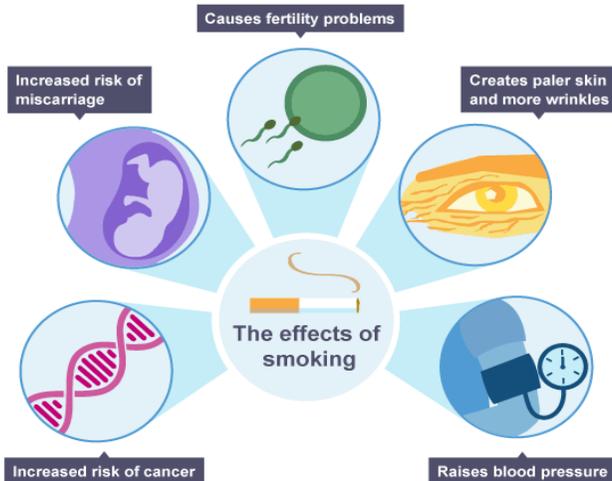
Unhealthy lifestyle choices

Nicotine

Nicotine is another _____ drug that is used as a mild stimulant and is consumed in cigarettes, _____, pipes and vaporisers.

Smoking can have very bad _____ effects, including:

-
-
-
-
-



Alcohol

Alcohol such as beer, _____ and spirits are legal to buy, only if you are over _____. Drinking large amounts can have the following effects:

-
-
-

Year 9 Life Chances: Unhealthy lifestyle choices

Illegal Drugs

There is a huge range of illegal drugs that change the user's state of mind. Some induce euphoria and confidence, others dull pain or cause hallucinations.

Some illegal drugs include cocaine, heroin and MDMA (known as 'ecstasy').



Different drugs affect your health in different ways, but there are some problems common to them all:

- more illnesses, deaths, and disabilities are caused by substance abuse than from any other preventable health condition
- drugs weaken your immune system, leaving you open to infections
- some drugs can cause nausea, vomiting, and abdominal pain
- some drugs can cause heart disease; this may be an abnormal heartbeat, but it could escalate to a heart attack
- injected drugs, such as heroin, can cause your veins to collapse and infections in your circulatory system
- seizures, strokes, and other types of brain damage can be caused by some types of drugs. This may leave you with long-term memory and cognitive problems. Others can cause mental illness such as depression or schizophrenia
- many drugs are addictive, which means that users are compelled to use the drug whether they really want to or not. This can lead to financial and social problems as the user prioritises the drug over other aspects of their life
- some drugs can kill through overdose

Year 9 Life Chances: Unhealthy lifestyle choices

Illegal Drugs

There is a huge range of _____ drugs that change the user's state of mind.

Some induce _____ and confidence, others _____ pain or cause hallucinations.

Some illegal drugs include _____, heroin and MDMA (known as 'ecstasy').

Different drugs affect your health in different ways, but there are some problems common to them all:



Definition 1

A substance people take to change the way they feel, think or behave.

United Nations Office on Drugs and Crime



What is a controlled Drug?

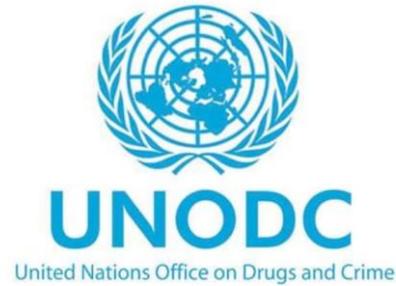
A drug or other **substance that is tightly controlled by the government because it may be abused or cause addiction.** The control applies to the way the substance is made, used, handled, stored, and distributed.

Definition 2

'A medicine or other substance which has a physiological effect when ingested or otherwise introduced into the body.'

Drugs which can be legally bought over the counter	Controlled drugs	Drugs prescribed by a healthcare professional
paracetamol	cocaine	antibiotics
alcohol	anabolic steroids	tranquilisers
cigarettes	heroin	antihistamines
Calpol	cannabis	
e-cigarettes	tranquilisers	
antihistamines	ecstasy	
	synthetic cannabinoids	

Definition 1



*United Nations Office
on Drugs and Crime*

Definition 2

Drugs which can be legally bought over the counter	Controlled drugs	Drugs prescribed by a healthcare professional

Year 9 Life chances: Drugs



- In the UK, controlled drugs are classified based on their benefit when used in medical treatment or the harm that they can do if misused.
- **Class A drugs** include: heroin, cocaine, crack/cocaine, ecstasy, LSD, magic mushrooms, methadone and methamphetamine (crystal meth)
- **Class B drugs** include: amphetamines, barbiturates, cannabis, codeine, ketamine.
- **Class C drugs** include: tranquillisers, khat, nitrous oxide (laughing gas) and anabolic steroids.

Possession means that an individual is caught with a controlled drug for personal use. The person does not have to be using it, just to have it in their possession.

Possession with intent to supply means that a person is planning to give controlled drugs to someone else. This includes selling, sharing or giving for free.

Supply means that a person distributes or gives someone else controlled drugs. This can be selling, giving for a reward of some form, sharing or giving for free.

Year 9 Life chances: Drugs

- In the UK, controlled drugs are classified based on their _____ when used in _____ treatment or the harm that they can do if _____.
- **Class A drugs**
- **Class B drugs**
- **Class C drugs**



Possession means that

Possession with intent to supply means that a

Supply means that a

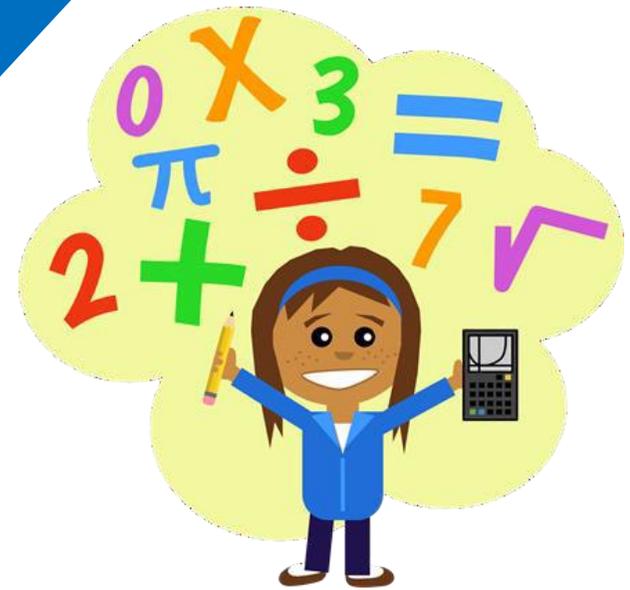
Year 9 Life chances: Drugs

Category	Maximum penalty for possession	Maximum penalty for supply and production
<i>Class A</i>	Up to 7 years in prison, an unlimited fine or both	Up to life in prison, an unlimited fine or both
<i>Class B</i>	Up to 5 years in prison, an unlimited fine or both	Up to 14 years in prison, an unlimited fine or both
<i>Class C</i>	Up to 2 years in prison, an unlimited fine or both (except anabolic steroids - it's not an offence to possess them for personal use)	Up to 14 years in prison, an unlimited fine or both
<i>Temporary class drugs</i>	None, but police can take away a suspected temporary class drug	Up to 14 years in prison, an unlimited fine or both

Year 9 Life chances: Drugs

Category	Maximum penalty for possession	Maximum penalty for supply and production
<i>Class A</i>		
<i>Class B</i>		
<i>Class C</i>		
<i>Temporary class drugs</i>		

Maths



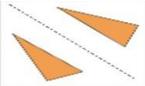
Helping every person achieve things they never thought they could.

Year 9: All the topics that will be taught this year.

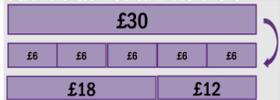
	Topic	Spax Clip
Simplifying Expressions	Algebraic Notation	M813
	Algebraic Terminology	M830
	Collecting like terms	M795/M531
	Simplifying expressions using index laws	M120
Sequences	Changing the subject of the formula with 1 step	M242
	Changing the subject of the formula with 2 or more steps	M983
	Generate a sequence	M381/M166
	Nth Term	M991
Graphs	Quadratic Sequences	U206
	Plotting Straight Line Graphs	M932
	Plotting Quadratic Graphs	U989
	Interpreting Quadratic Graphs	U667
Vectors	Draw Vectors	U632
	Multiplying Column Vectors by a Scalar	U564
	Adding and Subtracting Column Vectors	U903
	Identify Parallel Vectors	U660
Operations with Fractions	Adding and Subtracting Fractions	M835
	Adding and Subtracting Mixed Numbers	M931
	Adding and Subtracting Algebraic Fractions	M336
	Expand Single Brackets	M237
Brackets	Expand Multiple Single Brackets	M792
	Factorise into Single Brackets	M100
	Expand Double Brackets	M960
	Factorise Quadratics a = 1	M908
	Factorise Quadratics a > 1	M908
	Solving Problems using Proportional Reasoning	M478
Ratio & Proportion	Sharing Ratio	M525
	Ratio Problems with 1 Unknown	M801
	More Than/Less Than Ratio Problems	U577
	Solving 1 Step Equations	M707
Solving Linear Equations	Solving 2 Step Equations	M634/M647/M401/M387
	Solve Equations with Brackets	M902
	Solve Equations with Unknowns on Both Sides	M554
	Constructing and Solving Equations	M957
Percentages	Percentage of Amounts	M437
	Percentage Increase & Decrease Non Calc	M476
	Reverse Percentage	M528
	Percentage Increase & Decrease Calc	M533
	Simple Interest	U533
Compound Measures	Compound Interest	U332
	Calculating Speed	U151
	Calculating Density	U910
Standard Form	Multiplying and Dividing by 10, 100, 1000	M113
	Converting Standard Form	M678/M719
	Calculating Standard Form	U264
Solving Quadratics	Solving Quadratics when a=1	U228
	Solving Quadratics when a>1	U960
Area, Perimeter & Surface Area	Area of Rectangles	M390
	Area of Triangles	M610
	Area of Parallelograms	M291
	Area of Trapeziums	M705
	Identify Parts of Circles	M595
	Area of Circles	M231
	Circumference of Circles	M169
	Surface Area of Cuboids	M534
	Surface Area of Prisms	M661
	Surface Area of Cylinders	M936
	Area of Sectors	M430
	Arc Length	M280
	Pythagoras' Theorem	M677
	Understanding sin, cos and tan	U605
Finding unknown sides in right-angled triangles	U283	
Finding unknown angles in right-angled triangles	U545	
Angles in Polygons	Angles in Triangles	M351
	Angles in Quadrilaterals	M679
	Angles in Polygons	M653
Translations	Translation	U196
Angles in Parallel Lines	Angles on Straight Line and About a Point	M818
	Vertically Opposite Angles	M163
	Angles on Parallel Lines	M606
Volume	Volume of Cuboids	M765
	Volume of Prisms	M722

Year 9 Maths:

Key Vocabulary

1	Line of Symmetry	<ul style="list-style-type: none"> A line where one half of the image is the mirror of the other. 	
2	Rotational Symmetry	<ul style="list-style-type: none"> The number of time the shape fits on top of itself in a 360° rotation 	e.g. a square has rotational symmetry order 4
3	Reflection	<ul style="list-style-type: none"> An image or shape as it would be seen in a mirror 	
4	Ratio	<ul style="list-style-type: none"> A relationship between two or more numbers. 	The ratio of yellow counters to red counters in 2:3 
5	Parts	<ul style="list-style-type: none"> The individual numbers that make up a ratio 	The ratio 5:9 is made up of 5 parts and 9 parts. The ratio 5:9 has 14 parts in total.
6	Unit Ratio	<ul style="list-style-type: none"> The general form of a unit ratio is 1:n or n:1. 	The ratio 5:20 be written as the unit ratio 1:4.
7	Proportion	<ul style="list-style-type: none"> A relationship between two numbers/quantities 	If in a recipe for 4 people, 100g of flour is needed, then 200g would be needed for 8 people.
8	Ratio when given one quantity	<ul style="list-style-type: none"> A method of finding the missing quantity when given a ratio and 1 quantity 	Some sweets are shared between Bill and Ben in the ratio 3:2. Bill gets 30 sweets, so Ben gets 20 sweets.

Key Facts

9	Simplifying Ratio is to reduce ratio to its simplest form by dividing by common factors	$\begin{array}{r} 12:20 \\ \div 4 \quad \div 4 \\ \hline 3:5 \end{array}$ <p>Divide by 4 as it is the HCF of 12 and 20.</p>
10	Fraction of a Ratio is the proportion of the ratio of the total amount.	<p>The ratio of blue sweets to green sweets is 4:5.</p> <p>Therefore $\frac{4}{9}$ of the sweets are blue and $\frac{5}{9}$ of the sweets are green.</p>
11	Percentage of a Ratio is the proportion of the ratio of the total amount.	<p>The ratio of blue sweets to green sweets is 3:2.</p> <p>Therefore</p> $\frac{3}{5} = \frac{60}{100} = 60\% \text{ of the sweets are blue and}$ $\frac{2}{5} = \frac{40}{100} = 40\% \text{ of the sweets are green.}$
12	Sharing into a Ratio is a method of sharing an amount into a given ratio	<p>Share £30 into the ratio 3:2</p> 



Year 9 Maths:

Key Vocabulary

1	What is a Line of symmetry ?	
2	What is rotational symmetry ?	
3	What is the name for a shape that is flipped as if it is seen in a mirror?	
4	What is the definition of a ratio ?	
5	What does the word parts mean?	
6	What are the two general forms of an unit ratio ?	
7	What is the definition of the word proportion ?	
8	Some sweets are shared between Bill and Ben in the ratio 3:5. Bill gets 24 sweets, how many sweet does Ben have?	

Key Facts

9	How do you simplify a ratio?
10	How do you write a fraction of a ratio?
11	How do you write a percentage of a ratio?
12	What does sharing into a ratio mean?

$$\frac{1}{4}$$

$$\frac{3}{4}$$

$$\frac{1}{2}$$

Year 9 Maths:



Key Vocabulary

13	Algebraic Expression	<ul style="list-style-type: none"> Contains numbers, variables and operations Does not have an equals sign 	$4x + 5y$ $2a$ $y^2 - 5y$
14	Variable	<ul style="list-style-type: none"> A symbol, or letter representing an unknown number e.g. x, y, b, a^2 	x is the variable in $3x = 18$
15	Coefficient	<ul style="list-style-type: none"> The number in front of the variable 	The coefficient of x in $3x$ is 3.
16	Term	<ul style="list-style-type: none"> A number, variable or combination of both 	$5x$ ab 9
17	Sequence	<ul style="list-style-type: none"> A set of numbers that follow a rule 	$3, 6, 9, 12, 15, \dots$ $2, 5, 8, 11, 14, \dots$ $4, 8, 16, 32, 64, \dots$
18	Term (in a sequence)	<ul style="list-style-type: none"> An individual number in the sequence 	For the sequence $1, 3, 5, 7, \dots$ 3 is the second term
19	Arithmetic Sequence	<ul style="list-style-type: none"> Has the same difference between each term 	Also called a linear sequence. Example: $3, 5, 7, 9, 11, \dots$
20	Geometric Sequence	<ul style="list-style-type: none"> Where you must multiply or divide by the same number to get the next term 	Example: $1, 3, 9, 27, 81, \dots$
21	Term to Term Rule	<ul style="list-style-type: none"> How to get from one number in a sequence to the next 	Example: Add 4
22	Generate	<ul style="list-style-type: none"> Using the sequence rule to work out terms in the sequence. 	Generate the first 3 terms of $3n + 4$: $() \quad 3 \times 1 + 4 = 7$ $() \quad 3 \times 2 + 4 = 10$ $() \quad 3 \times 3 + 4 = 13$

Year 9 Maths:



Key Vocabulary

13

What is an **algebraic expression**?

14

What is a **variable**?

15

What is a **coefficient**?

16

Write down some examples of mathematical **terms**.

17

What is a **sequence**?

18

What is a **term in a sequence**?

19

How do you know if a **sequence is arithmetic**?

20

How do you know if a **sequence is geometric**?

21

What does the **term to term rule** do?

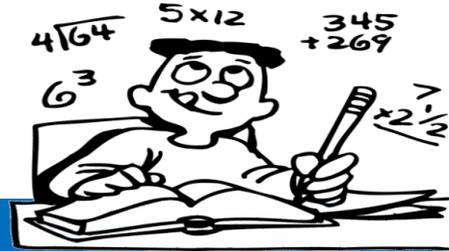
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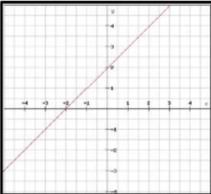
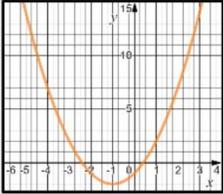
When you are asked to **generate** the first 5 numbers in a sequence, what does that mean?

Year 9 Maths:

Key Facts

23	Index law of Multiplication	$x^a \times x^b = x^{a+b}$ <p>Add the powers</p>
24	Index law of Division	$x^a \div x^b = x^{a-b}$ <p>Subtract the powers</p>
25	Index Law for Powers of Powers	$x^a{}^b (= x^{a \times b})$ <p>Subtract the powers</p>
26	Nth term A rule that allows you to find any term in the sequence.	Remember the "n" in nth term means position in the sequence. The first term in the sequence means $n = 1$, second term means $n = 2$.



27	Fibonacci Sequence	<p>Starting with 0 and 1, add the previous two terms to get the next one.</p> <p>0, 1, 1, 2, 3, 5, 8, 13, 21, 34, ...</p>
28	Linear Graphs	<p>A linear graph is a straight line.</p> 
29	Quadratic Graphs A quadratic equation is x^2	<p>A U shape (or an upside down U). e.g. $y = x^2 + 2x - 1$</p> 

Year 9 Maths:

Key Facts

Write down the **Index Law of Multiplication**.

23

Write down the **Index Law of Division**.

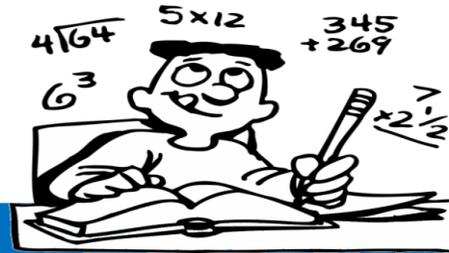
24

Write down the **Index Law for Powers of Powers**.

25

What is **the nth term of a sequence**?

26



What is the **Fibonacci Sequence**?

27

What shape is a **Linear graph**?

28

What shape is a **Quadratic graph**?

29

Year 9 Maths: Fraction Arithmetic

	Key Skill	Thinking Point	WAGOLL
1	Adding and Subtracting (same denominator)	<ul style="list-style-type: none"> Add or subtract the numerators. Denominator stays the same. 	$\frac{3}{5} + \frac{1}{5} = \frac{4}{5}$
2	Adding and subtracting (different denominators)	<ul style="list-style-type: none"> Use equivalent fractions to find a common denominator. Add or subtract the numerators. 	$\frac{3}{5} - \frac{1}{4}$ $\frac{12}{20} - \frac{5}{20} = \frac{7}{20}$
3	Adding and subtracting (mixed numbers)	<ul style="list-style-type: none"> Convert to improper fractions first Use equivalent fractions to find a common denominator Add or subtract the numerators Simplify and convert to mixed number 	$2\frac{3}{4} + 3\frac{1}{5} = \frac{11}{4} + \frac{16}{5}$ $\frac{55}{20} + \frac{64}{20} = \frac{119}{20} = 5\frac{19}{20}$

Key Vocabulary	Definition
Numerator	The top number in a fraction.
Denominator	The bottom number in a fraction.
Improper Fraction	A fraction in which the numerator is larger than the denominator, e.g. $\frac{6}{5}$
Mixed Number	A number comprising a whole number and a fraction, e.g. $5\frac{1}{2}$

Year 9 Maths: Fraction Arithmetic

	Key Skill	Thinking Point	Practice
1	Adding and Subtracting (same denominator)	<ul style="list-style-type: none"> What happens to the numerators? What happens to the denominators? 	$\frac{3}{7} - \frac{2}{7} =$
2	Adding and subtracting (different denominators)	<ul style="list-style-type: none"> What must we find before we can add or subtract? 	$\frac{3}{8} + \frac{5}{6}$
3	Adding and subtracting (mixed numbers)	<ul style="list-style-type: none"> What should mixed numbers be converted to first? We should always _____ our answers if possible, converting _____ fractions to _____. 	$2\frac{3}{10} - 1\frac{2}{3} =$

Key Vocabulary	Complete the definitions
Numerator	
Denominator	
Improper Fraction	
Mixed Number	

Year 9 Maths: Algebra - Brackets

	Key Skill	Thinking Point	WAGOLL	
1	Expand a single bracket	<ul style="list-style-type: none"> Multiply every term inside the bracket by the term outside the bracket Grid method will help you 	Expand $3(x + 2)$ $= \underline{3x + 6}$	Expand $4x(3x - 1)$ $= \underline{12x^2 - 4x}$
2	Expand and simplify	<ul style="list-style-type: none"> Expand each bracket Collect any like terms to simplify 	$3(x + 7) - 2(3x - 4)$ $3x + 21 - 6x + 8$ $= \underline{-3x + 29}$	
3	Factorise an expression	<ul style="list-style-type: none"> Find the highest common factor (HCF) of all terms. This belongs outside the bracket. Use reverse grid method to find what goes in the bracket 	Factorise fully $4x + 18$ HCF of $4x$ and 18 is 2 $\underline{2(2x + 9)}$	Factorise fully $18y^3 - 12y$ HCF of $18y^3$ and $-12y$ is $6y$ $\underline{6y(3y^2 - 2)}$

Key Vocabulary	Definition
Variable	A symbol or letter representing a value we do not know.
Coefficient	A number used to multiply a variable, e.g. in the term " $4x$ ", the coefficient of x is 4 .
Expression	Numbers, variables and operators (+, -, \times and \div), grouped together to show the value of something. Expressions do not have an equals sign.
Constant	A number on its own, e.g. in the expression $5x + 8$, the constant is 8 .

Year 9 Maths: Algebra - Brackets

	Key Skill	Thinking Point	Practice
1	Expand a single bracket	What method could I use to help expand brackets?	Expand a) $4(5x + 3)$ b) $6(2x - 1)$ c) $5x(3x + 8y)$
2	Expand and simplify	After expanding, I must collect _____ in order to simplify	a) $3(2x + 1) + 4(x + 3)$ b) $7(3x + 11) - 4(5x - 2)$
3	Factorise an expression	What does HCF stand for?	Factorise fully a) $6x + 12$ b) $9t - 3$ c) $14p^2 + 7p^3$

Key Vocabulary	Complete the definitions
Variable	
Coefficient	
Expression	
Constant	

Year 9 Maths: Algebra – Solving Equations

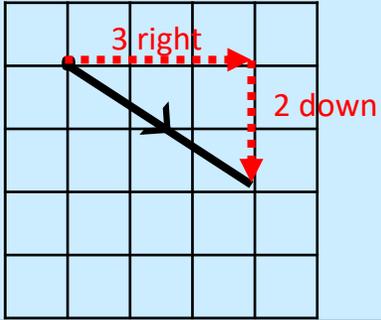
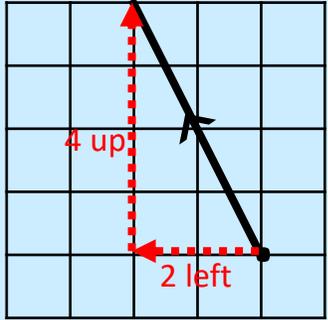
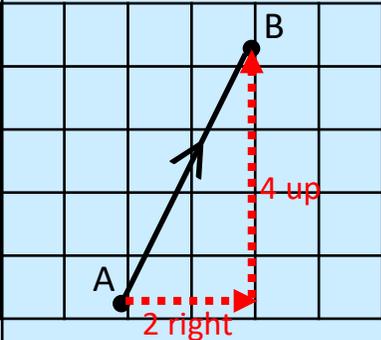
	Key Skill	Thinking Point	WAGOLL
1	Solve a one step equation	<ul style="list-style-type: none"> Think about what has happened to the variable, and use the <i>inverse operation</i> to undo this. 	$x + 6 = 16$ $x = 10$
2	Solve a multiple step equation	<ul style="list-style-type: none"> Try to <i>isolate the variable</i> using inverse operations, one step at a time 	$4x - 5 = 19$ $4x = 24$ $x = 6$
3	Solve equations with the unknown on both sides	<ul style="list-style-type: none"> Eliminate the variables from one side of the equation first, remembering to keep the equation balanced. 	$2x + 11 = 5x + 2$ $11 = 3x + 2$ $9 = 3x$ $3 = x$

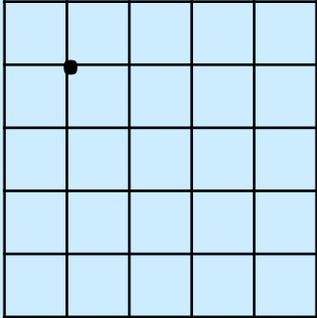
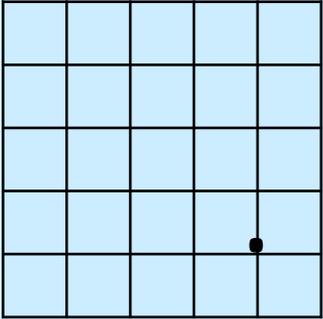
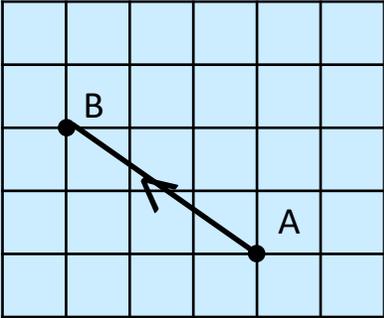
Key Vocabulary	Definition
Equation	A statement showing that two expressions are equal
Variable	A symbol or letter representing a value we do not know.
Solution	The value of the variable once we have worked it out.

Year 9 Maths: Algebra – Solving Equations

	Key Skill	Thinking Point	Practice
1	Solve a one step equation	<ul style="list-style-type: none"> Use _____ operations to solve the equation. 	Solve a) $x - 7 = 5$ b) $6x = 54$ c) $\frac{x}{8} = 2$
2	Solve a multiple step equation	<ul style="list-style-type: none"> Try to _____ the _____, one step at a time. 	Solve a) $3x - 7 = 5$ b) $6x + 12 = 54$ c) $\frac{x}{5} - 1 = 4$
3	Solve equations with the unknown on both sides	<ul style="list-style-type: none"> First you should _____ the variable from one side of the equation. 	Solve a) $3x + 4 = 2x + 1$ b) $5x - 7 = 9x - 3$

Key Vocabulary	Complete the definitions
Equation	
Variable	
Solution	

	Key Skill	Thinking Point	WAGOLL	
1	<p>Drawing Vectors</p>	<ul style="list-style-type: none"> The top number of a vector tells how many units to left or right we move. If it is positive we move to the right. If it is negative we move to the left. The bottom number of a vector tells how many units up or down we move. If it is positive we move upwards. If it is negative we move downwards. Add an arrow to show the direction of travel. 	<p>Draw the vector $\begin{pmatrix} 3 \\ -2 \end{pmatrix}$</p> <p>This means 3 units to right and 2 units down. We start counting from the dot.</p> 	<p>Draw the vector $\begin{pmatrix} -2 \\ 4 \end{pmatrix}$</p> <p>This means 2 units to left and 4 units up. We start counting from the dot.</p> 
2	<p>Writing Column Vectors</p>	<ul style="list-style-type: none"> Follow the direction of travel. Count the horizontal movement first, remember right is positive and left is negative. Count the vertical movement, remember up is positive and down is negative. 	<p>Write down the vector \overrightarrow{AB}</p>  <p>2 units to rights = $\begin{pmatrix} 2 \\ 4 \end{pmatrix}$ 4 units up</p>	

	Key Skill	Thinking Point	Practice	
1	<p>Drawing Vectors</p>	<ul style="list-style-type: none"> • What does the top number tell us? What if it is negative? • What does the bottom number tell us? What if it is negative? • What do we add at the end? 	<p>Draw the vector $\begin{pmatrix} 4 \\ -3 \end{pmatrix}$</p> 	<p>Draw the vector $\begin{pmatrix} -3 \\ 2 \end{pmatrix}$</p> 
2	<p>Writing Column Vectors</p>	<ul style="list-style-type: none"> • Follow the direction of travel. • Count the horizontal movement first, remember right is positive and left is negative. • Count the vertical movement, remember up is positive and down is negative. 	<p>Write down the vector \overrightarrow{AB}</p> 	

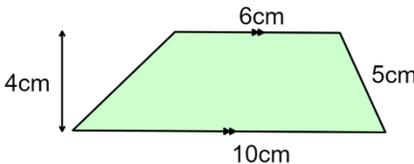
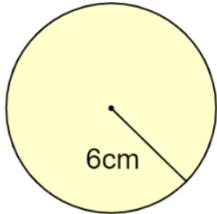
	Key Skill	Thinking Point	WAGOLL
1	Adding and Subtracting Vectors	<ul style="list-style-type: none"> Add/Subtract the top numbers together Add/Subtract the bottom numbers together 	$\begin{aligned} & \begin{pmatrix} 3 \\ 5 \end{pmatrix} + \begin{pmatrix} -2 \\ 4 \end{pmatrix} \\ &= \begin{pmatrix} 3 + -2 \\ 5 + 4 \end{pmatrix} \\ &= \begin{pmatrix} 3 - 2 \\ 5 + 4 \end{pmatrix} \\ &= \begin{pmatrix} 1 \\ 9 \end{pmatrix} \end{aligned}$
2	Multiplying Vectors	<ul style="list-style-type: none"> Multiply the both numbers in the vector by the number outside the vector 	$\begin{aligned} & 3 \begin{pmatrix} 3 \\ 5 \end{pmatrix} \\ &= \begin{pmatrix} 3 \times 3 \\ 3 \times 5 \end{pmatrix} \\ &= \begin{pmatrix} 9 \\ 15 \end{pmatrix} \end{aligned}$
3	Composite problems with Vectors	<ul style="list-style-type: none"> Follow order of operations Use the steps above Be careful with negative numbers 	$\begin{aligned} & 3 \begin{pmatrix} 3 \\ 5 \end{pmatrix} + \frac{1}{2} \begin{pmatrix} -2 \\ 4 \end{pmatrix} \\ &= \begin{pmatrix} 3 \times 3 \\ 3 \times 5 \end{pmatrix} + \begin{pmatrix} \frac{1}{2} \times -2 \\ \frac{1}{2} \times 4 \end{pmatrix} \\ &= \begin{pmatrix} 9 \\ 15 \end{pmatrix} + \begin{pmatrix} -1 \\ 2 \end{pmatrix} \\ &= \begin{pmatrix} 9 + -1 \\ 15 + 2 \end{pmatrix} \\ &= \begin{pmatrix} 9 - 1 \\ 15 + 2 \end{pmatrix} \\ &= \begin{pmatrix} 8 \\ 17 \end{pmatrix} \end{aligned}$

	Key Skill	Thinking Point	Practice	
1	Adding and Subtracting Vectors	<ul style="list-style-type: none"> What do we do to the top numbers? What do we do to the bottom numbers? 	$\begin{pmatrix} 2 \\ 3 \end{pmatrix} + \begin{pmatrix} -1 \\ 7 \end{pmatrix}$	$\begin{pmatrix} 4 \\ -5 \end{pmatrix} - \begin{pmatrix} -3 \\ 1 \end{pmatrix}$
2	Multiplying Vectors	<ul style="list-style-type: none"> _____ the both numbers in the vector by the number _____ the vector 	$2 \begin{pmatrix} -3 \\ 5 \end{pmatrix}$	$-2 \begin{pmatrix} 3 \\ 5 \end{pmatrix}$
3	Composite problems with Vectors	<ul style="list-style-type: none"> What must we follow while doing these calculations? 	$2 \begin{pmatrix} 3 \\ 5 \end{pmatrix} + 3 \begin{pmatrix} 2 \\ 4 \end{pmatrix}$	$4 \begin{pmatrix} 1 \\ -2 \end{pmatrix} - 3 \begin{pmatrix} -2 \\ 3 \end{pmatrix}$

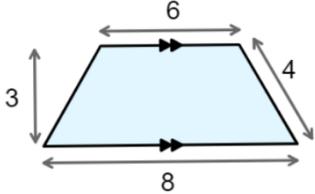
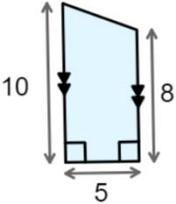
Year 9 Maths: Percentages

Key Skill	Thinking Point	WAGOLL
Calculate a percentage of a quantity	<ul style="list-style-type: none"> 10% is the same as $\frac{1}{10}$, so I can find 10% by dividing by 10 50% is the same as $\frac{1}{2}$, so I can find 50% by dividing by 2 	<p>Find 70% of £280</p> <p>50% = £280 ÷ 2 = £140 10% = £280 ÷ 10 = £28</p> <p>70% = 50% + 10% + 10% 70% = £140 + £28 + £28 = £196</p>
Calculate a percentage increase or decrease	<ul style="list-style-type: none"> Increase, growth, extend, rise, inflate are some often used key words meaning to get bigger. Decrease, devalue, reduce, decline, discount are some often used key words meaning to get smaller 	<p>Sam earns £25000 a year. He received a bonus of 20% last year. Calculate his total income for last year.</p> <p>10% = £25000 ÷ 10 = £2500</p> <p>20% = 10% + 10% 20% = £2500 + £2500 = £5000</p>
Key Vocabulary	Definition	
Percentage	A proportion expressed in parts per 100	
Increase	To go up	
Decrease	To go down	
Interest	Money paid to you on savings, or an amount you pay to the bank for borrowing.	

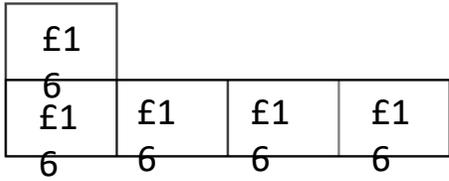
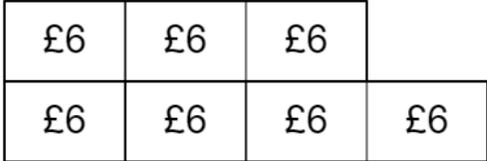
Year 9 Maths: Area

Key Skill	Thinking Point	WAGOLL
Calculate the area of a trapezium	<ul style="list-style-type: none"> The formula is $A = \frac{a+b}{2} \times h$ a and b are the parallel sides h is the perpendicular height 	<p>Calculate the area</p>  $A = \frac{6+10}{2} \times 4$ $= \frac{16}{2} \times 4$ $= 8 \times 4 = 32\text{cm}^2$
Calculate the area of a circle	<ul style="list-style-type: none"> The formula is πr^2 r is the radius of the circle 	<p>Calculate the area</p>  $A = \pi(6)^2$ $= \pi \times 36$ $= 36\pi \text{ cm}^2 \text{ or } 113.1\text{cm}^2 \text{ (1dp)}$
Key Vocabulary	Definition	
Radius	The straight line from the centre of a circle to the circumference (half the diameter)	
Diameter	The straight line through the centre of a circle, from circumference to circumference (double the radius)	
Circumference	The outer edge of a circle	

Year 9 Maths: Area

Key Skill	Thinking Point	Practise	
<p>Calculate the area of a trapezium</p>	<ul style="list-style-type: none"> The formula is $A = \frac{a+b}{2} \times h$ a and b are the _____ h is the _____ 	<p>Find the area</p> <p>a)</p> 	<p>b)</p> 
<p>Calculate the area of a circle</p>	<ul style="list-style-type: none"> The formula is πr^2 r is the _____ of the circle 	<p>Find the area of these circles in terms of π</p> <p>a) Radius = 4cm</p> <p>b) Radius = 8cm</p> <p>c) Diameter = 10mm</p>	
<p>Key Vocabulary</p>	<p>Complete the definitions</p>		
<p>Radius</p>			
<p>Diameter</p>			
<p>Circumference</p>			

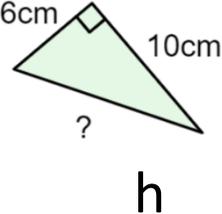
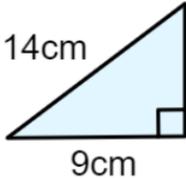
Year 9 Maths: Ratio

Key Skill	Thinking Point	WAGOLL
Dividing into a ratio	<ul style="list-style-type: none"> Use a Bar Model diagram. Check your answer by ensuring your answers total the original amount in the question. 	 <p>£80 in 5 parts means $£80 \div 5 = £16$ in each part</p> <p>$1 \times £16 : 4 \times £16$ <u>£16 : £64</u></p>
Finding the original quantity given one part	<ul style="list-style-type: none"> Put all the information from the question onto a Bar Model diagram When we are only given one part, we only use that part of the ratio for the first step. Read the question carefully and make sure you answer it. 	<p>Jay and Kay share some money in the ratio 3:4. Jay gets £18. How much did they share altogether?</p>  <p>£18 in Jay's 3 parts means $£18 \div 3 = £6$ in each part</p> <p>$3 \times £6 : 4 \times £6$ $£18 : £24$ $£18 + £24 = £42$</p>
Key Vocabulary	Definition	
Ratio	A way in which quantities can be divided or shared	
Scale	The ratio of a length in a diagram or map to the length in real life	

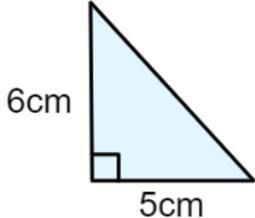
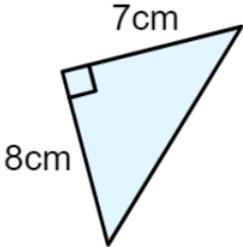
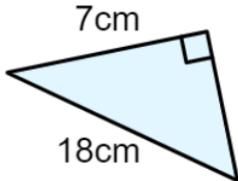
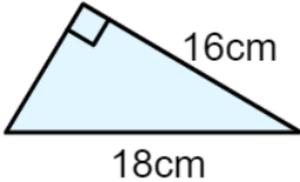
Year 9 Maths: Ratio

Key Skill	Practise		
Dividing into a ratio	a) Share £60 in the ratio 4:1	b) Share £48 in the ratio 5:3	c) Share £72 in the ratio 4:5
Finding the original quantity given one part	a) A prize is divided in the ratio 5 : 2. If the larger share is £225 what is the smaller share?		b) A prize is divided in the ratio 5 : 4. If the smaller share is £50 what is the larger share?
Key Vocabulary	Complete the definitions		
Ratio			
Scale			
B___ M_____	A diagram which is useful when solving ratio problems		

Year 9 Maths: Pythagoras' Theorem

Key Skill	Thinking Point	WAGOLL
Finding the Hypotenuse	<ul style="list-style-type: none"> Label the hypotenuse on the diagram. The hypotenuse is always opposite the right angle Learn the formula $a^2 + b^2 = h^2$ 	 $6^2 + 10^2 = h^2$ $36 + 100 = h^2$ $136 = h^2$ $\sqrt{136} = h$ $h = 11.66 \text{ (2dp)}$
Finding a shorter side	<ul style="list-style-type: none"> Remember to substitute correctly. If your answer is longer than the hypotenuse, you have made a mistake 	 $9^2 + h^2 = 14^2$ $81 + h^2 = 196$ $h^2 = 196 - 81$ $h^2 = 115$ $h = \sqrt{115}$ $h = 10.72 \text{ (2dp)}$
Key Vocabulary	Definition	
Hypotenuse	The longest side in a triangle	
Square Root	A value which equals the given number when multiplied by itself, e.g. the square root of 16 is 4	

Year 9 Maths: Pythagoras' Theorem

Key Skill	Thinking Point	Practise	
<p>Finding the Hypotenuse</p>	<ul style="list-style-type: none"> The formula for Pythagoras' Theorem is; 	<p>Find the hypotenuse</p> <p>a)</p> 	<p>b)</p> 
<p>Finding a shorter side</p>	<ul style="list-style-type: none"> How can I check if I have made an error? 	<p>Find the missing sides</p> <p>a)</p> 	<p>b)</p> 
<p>Key Vocabulary</p>	<p>Complete the definitions</p>		
<p>Hypotenuse</p>			
<p>Square Root</p>			

Year 9 Maths: Standard form

Key Skill	Thinking Point	WAGOLL	
Converting to standard form	<ul style="list-style-type: none"> Standard form means write in the form $a \times 10^n$ a must be between 1 and 10, n must be an integer 	2 540 000 = $2.54 \times 1\,000\,000$ = 2.54×10^6	0.00718 = $7.18 \div 1000$ = $7.18 \div 10^3$ = 7.18×10^{-3}
Converting to an ordinary number	<ul style="list-style-type: none"> To multiply by powers of 10 we move digits to the left To divide by powers of 10 we move digits to the right 	3.6×10^5 = $3.6 \times 10\,000$ = 36 000	4.2×10^{-4} = $4.2 \div 10^4$ = $4.2 \div 10\,000$ = 0.00042
Key Vocabulary	Definition		
Standard form	A method of writing large or small numbers using powers of 10		

Year 9 Maths: Standard form

Key Skill	Thinking Point	Practise
Converting to standard form	<ul style="list-style-type: none"> Standard form means write in the form $a \times 10^n$ a must be _____ n must be _____ 	Write in standard form a) 7430000 b) 4923 c) 0.095 d) 0.000018
Converting to an ordinary number	<ul style="list-style-type: none"> To multiply by powers of 10 we move digits to the _____ To divide by powers of 10 we move digits to the _____ 	Write as an ordinary number a) 6×10^5 b) 4.8×10^8 c) 7×10^{-3} d) 1.05×10^{-6}
Key Vocabulary	Complete the definitions	
Standard form	A method of writing _____ or _____ numbers using powers of 10	

Modern Foreign Languages



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Year 9 French: Irregular present tense**To have... (Verb)****Avoir** To have**J'ai** I have...**Tu as** You have...**Il a** He has...**Elle a** She has...**On a** One has
(We have)**Nous avons** We have...**Vous avez** You have
(formal/plural)**Ils ont** They have...
(Masculine/mixed)**Elles ont** They have...
(feminine)**To go... (Verb)****Aller** To go**Je vais** I go...**Tu vas** You go...**Il va** He goes...**Elle va** She goes...**On va** One goes
(We go)**Nous allons** We go...**Vous allez** You go
(formal/plural)**Ils vont** They go...
(Masculine/mixed)**Elles vont** They go...
(feminine)**To be... (Verb)****Être** To be**Je suis** I am...**Tu es** You are...**Il est** He is...**Elle est** She is...**On est** One is (We are)**Nous sommes** We are...**Vous êtes** You are...
(formal/plural)**Ils sont** They are...
(Masculine/mixed)**Elles sont** They are...
(feminine)

Year 9 French: Irregular present tense

To have... (Verb)

To have

I have...

You have...

He has...

She has...

One has
(We have)

We have...

You have
(formal/plural)

They have...
(Masculine/mixed)

They have...
(feminine)

To go... (Verb)

To go

I go...

You go...

He goes...

She goes...

One goes
(We go)

We go...

You go
(formal/plural)

They go...
(Masculine/mixed)

They go...
(feminine)

To be... (Verb)

To be

I am...

You are...

He is...

She is...

One is (We are)

We are...

You are...
(formal/plural)

They are...
(Masculine/mixed)

They are...
(feminine)

Year 9 French:

Grammar Explanation

Immediate Future Tense

To use the immediate future tense, take the appropriate form of the verb **aller** (to go) and add the infinitive verb.

For example:

Je vais + manger = je vais manger

= I am going to eat.

Nous allons + voyager = nous allons voyager

= we are going to travel.

Below are some high frequency infinitives for you to practise with:

Aller = to go

Jouer = to play

Regarder = to watch

Visiter = to visit

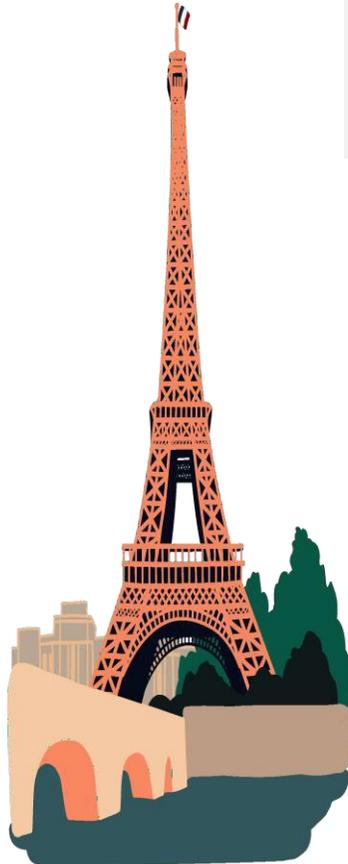
Faire = to do

Manger = to eat

Avoir = to have

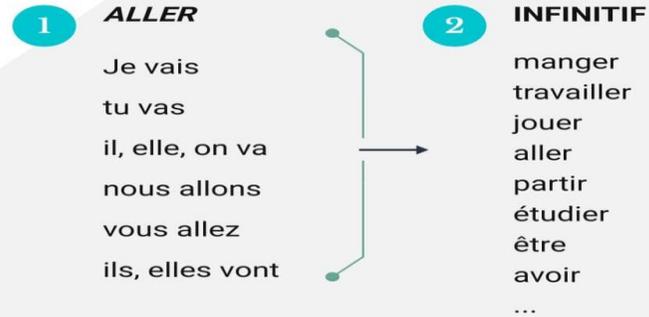
Être = to be

Prendre = to take



The near future tense

The verb **aller** with an infinitive can be used to express the near future. This is the equivalent of saying "be going to" in English.



Je vais travailler ici => I'm going to work here
Nous allons partir à Paris => We are going to Paris

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Forming negatives

Negative forms	English
ne...pas	not
ne...jamais	never, not ever
ne...plus	not anymore, no longer
ne...aucun	no, not any, none
ne...que	only
ne...rien	nothing, not anything
ne...personne	no one, not anyone
ne...ni...ni	neither...nor

Je **ne vais pas** = I am not going

Je **ne vais jamais** = I am never going

Year 9 French:

Grammar Explanation

Immediate Future Tense

To use the immediate future tense, take the appropriate form of the verb **aller** (to go) and add the infinitive verb.

For example:

Je vais + manger = je vais manger

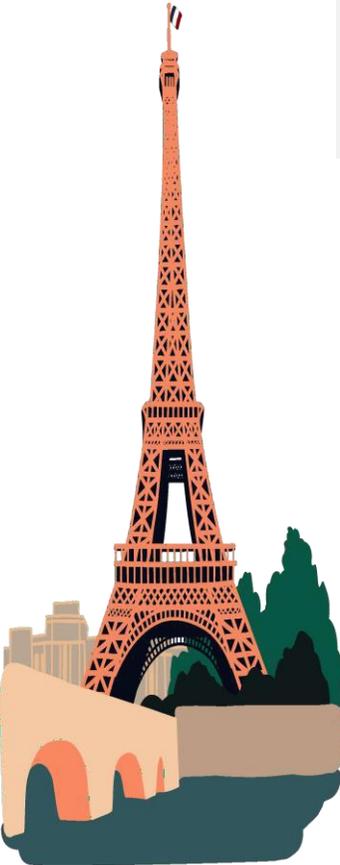
= I am going to eat.

Nous allons + voyager = nous allons voyager

= we are going to travel.

Below are some high frequency infinitives for you to practise with:

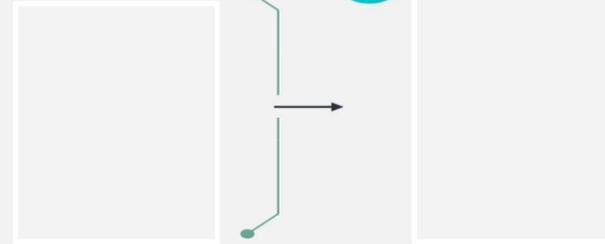
- = to go
- = to play
- = to watch
- = to visit
- = to do
- = to eat
- = to have
- = to be
- = to take



The near future tense

The verb **aller** with an infinitive can be used to express the near future. This is the equivalent of saying "be going to" in English.

- 1 **ALLER**
- 2 **INFINITIF**



Je vais travailler ici =>

Nous allons partir à Paris =

www.lecoledefrancais.nl

Forming negatives

Negative forms	English
ne...pas	
ne...jamais	
ne...plus	
ne...aucun	
ne...que	
ne...rien	
ne...personne	
ne...ni...ni	

= I am not going

= I am never going

Forming the perfect tense (passé composé)

The perfect tense is how you say that you have done something in the past. For example, 'I have eaten' or 'I have played'.

To form the perfect tense, usually you use an auxiliary verb. To do this, take the correct form of the verb avoir (to have) and add a past participle (reference to the past).

For example, to say 'I have eaten' you use **j'ai** for 'I have' and add **mangé** for eaten. So it is **j'ai mangé**.

Mangé (ate) is the past participle of manger (to eat).

J'ai	I have
Tu as	You have (singular/informal)
Il a	He has
Elle a	She has
On a	One has (we have)
Nous avons	We have
Vous avez	You have (formal/plural)
Ils ont	They have (masculine/mixed)
Elles ont	They have (feminine)

Forming a past participle:

Regular ER verbs	Take the ER ending off, and add é. For example MANGER changes to mangé.	J'ai mangé = I have eaten
Regular IR verbs	Take the IR ending off and add i. For example, FINIR (to finish) changes to fini.	J'ai fini = I have finished
Regular RE verbs	Take the RE ending off and add u. For example RÉPONDRE (to respond) changes to répondu	J'ai répondu = I have responded

Note: there are some verbs that do not follow the above rule. These are called 'irregular verbs'. One example is BOIRE (to drink) which changes to bu. J'ai bu = I drank

Le passé composé avec avoir

↓
2 éléments



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

+

ER => é
Manger => mangé
IR => i
Choisir => choisi
RE => u
vendre => vendu
IRREGULIERS : dit, été, eu, fait, pu, voulu, ...

Exemple : J'ai mangé une part de pizza.



Forming the perfect tense (passé composé)

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To form the perfect tense, usually you use an auxiliary verb. To do this, take the correct form of the verb avoir (to have) and add a past participle (reference to the past).

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Mangé (ate) is the past participle of manger (to eat).

	I have
	You have (singular/informal)
	He has
	She has
	One has (we have)
	We have
	You have (formal/plural)
	They have (masculine/mixed)
	They have (feminine)

Forming a past participle:

Regular ER verbs		
Regular IR verbs		
Regular RE verbs		

Note: there are some verbs that do not follow the above rule. These are called 'irregular verbs'. One example is BOIRE (to drink) which changes to bu. J'ai bu = I drank

Le passé composé avec avoir

↓
2 éléments



ER => _____
Manger => _____
IR => _____
Choisir => _____
RE => _____
vendre => _____
IRREGULIERS : dit, été, eu, fait, pu, voulu, ...

Exemple : J'ai mangé une part de pizza.



When forming the perfect tense for some verbs, you need to use **ÊTRE** as the auxiliary verb instead of **AVOIR**

Examples of verbs that take être are aller (to go), sortir (to go out).

RECAP of the auxiliary verb Être = to be

Je suis	I am
Tu es	You are(singular/informal)
Il est	He is
Elle est	She is
On est	One is (we are)
Nous sommes	We are
Vous êtes	You are (formal/plural)
Ils sont	They are (masculine/mixed)
Elles sont	They are (feminine)

In French you do not say "I went" instead you say "I am gone".

Je suis allé
I am gone (e.g. I went)

Il est allé
He is gone (e.g. he went)

To make it even trickier, the past participle agrees with the person using it.

Verb	Masculine	Feminine
ALLER (to go)	Je suis allé (I am gone) Ils sont allés (they are gone)	Je suis allée (I am gone) Elles sont allées (they are gone)
SORTIR (to go out)	Je suis sorti (I am went out)	Je suis sortie (I am went out)



Verbs: Using être in le passé composé

Le passé composé has 3 parts:

subject + auxiliary verb + past participle of verb

E.g. Je suis né en 1990 - I was born in 1990

Only two auxiliary verbs are used: **AVOIR** (to have) and **ÊTRE** (to be), conjugated to **PRESENT** tense and agrees w/subject

Most past participle verbs use avoir as the auxiliary verb.

The verbs that use être are «motion/movement» verbs & can be remembered by the mnemonic:

DR & MRS VANDERTRAMP

	Present	Meaning	Past Participle
D	Descendre	To descend	Descendu
R	Revenir	To come back	Revenu
M	Mourir	To die	Mort
R	Retourner	To go back	Retourné
S	Sortir	To go out	Sorti
V	Venir	To come	Venu
A	Arriver	To arrive	Arrivé
N	Naitre	To be born	Né
D	Devenir	To become	Devenu
E	Entrer	To enter	Entré
R	Rentrer	To go (home)	Rentré
T	Tomber	To fall	Tombé
R	Rester	To stay	Resté
A	Aller	To go	Allé
M	Monter	To go up	Monté
P	Partir	To leave	Parti

Note: irregular conjugated pp. endings are marked in white

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Describe where I live.

Key Grammar

Recap: Conjugating regular verbs that end in ER in the present tense.

Reminder: conjugating a verb means that you are taking its infinitive form (ER, RE or IR endings) to change it to I, you, we and to a particular tense (present, past, future)

HABITER (to live) in the present tense

Habiter is a regular verb that ends in ER.

To change a verb that ends in ER to the present tense, use the following process:

Use the appropriate pronoun (je, tu, il, elle, etc)

Take the ER ending off to form the **stem**. For example, change **habiter** to **habit**

Choose the correct ending according to the pronoun you are using. For ER verbs, the present tense endings are as follows:

Pronoun	Present Tense ER verb ending
Je	e
Tu	es
Il, elle, on	e
Nous	ons
Vous	ez
Ils, elles	ent

See the example HABITER in the present tense below:

J'habite	I live
Tu habites	You live (singular/informal)
Il habite	He lives
Elle habite	She lives
On habite	One lives (we like)
Nous habitons	We live
Vous habitez	You live (formal/plural)
Ils habitent	They live (masculine/mixed)
Elles habitent	They live (feminine)

Infinitive Verbs

Remember that an infinitive verb is the verb in the 'to' form before it has been changed.

Infinitive verbs end in ER, RE or IR

Examples:

Habiter = to live

Aller = to go

Être = to be

Avoir = to have

Saying there is or isn't something in your house.

Il y a = there is

For example, il y a un garage = there is a garage

Il n'y a pas de = there isn't

***When you use il n'y a pas de, you do not include un/une*

For example, il n'y a pas de garage = there isn't a garage



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Habiter is a regular verb that ends in ER.

To change a verb that ends in ER to the present tense, use the following process:

Use the appropriate pronoun (_____, tu, il, _____, etc)

Take the ER ending off to form the **stem**. For example, change _____ to **habit**

Choose the correct ending according to the pronoun you are using. For ER verbs, the present tense endings are as follows:

Pronoun	Present Tense ER verb ending
	e
	es
	e
	ons
	ez
	ent

See the example HABITER in the present tense below:

J'habite	I live
	You live (singular/informal)
	He lives
	She lives
	One lives (we like)
	We live
	You live (formal/plural)
	They live (masculine/mixed)
	They live (feminine)

Infinitive Verbs

Remember that an infinitive verb is the verb in the 'to' form before it has been changed.

Infinitive verbs end in ER, RE or ____

Examples:

Habiter =

Aller =

Être =

Avoir =

Saying there is or isn't something in your house.

Il y a =

For example, il y a un garage =

Il n'y a pas de =

***When you use il n'y a pas de, you do not include un/une*

For example, il n'y a pas de garage =

Describe where I live.

Recap: **AVOIR (to have)** in the present tense

J'ai	I have
Tu as	You have (singular/informal)
Il a	He has
Elle a	She has
On a	One has (we like)
Nous avons	We have
Vous avez	You have (formal/plural)
Ils ont	They have (masculine/mixed)
Elles ont	They have (feminine)

RECAP of Être (to be) in the present tense

Je suis	I am
Tu es	You are (singular/informal)
Il est	He is
Elle est	She is
On est	One is (we like)
Nous sommes	We are
Vous êtes	You are (formal/plural)
Ils sont	They are (masculine/mixed)
Elles sont	They are (feminine)

Useful Vocabulary

Places to live

Une maison = a house
 Un appartement = a flat
 Une ferme = a farm
 Un village = a village
 Une ville = a town
 Une cité = a city
 Au centre-ville = in the town centre
 Au bord de la mer = at the seaside
 À la campagne = in the countryside

Rooms in the house

La cuisine = the kitchen
 Le salon = the living room
 La salle de bains = the bathroom
 L'entrée = the hall/the entrance
 La salle à manger = the dining room
 La chambre = the bedroom
Deux chambres = two bedrooms
 Ma chambre = my bedroom
 Le jardin = the garden
 Le garage = the garage

Adjectives to describe your house

Adjective	Masculine	Masculine Plural	Feminine	Feminine Plural
Modern	Moderne	Modernes	Moderne	Modernes
Ugly	Laid	Laid	Laide	Laides
Big** goes before the noun	grand	grands	grande	grandes
Small** goes before the noun	petit	petits	petite	petites
Old** goes before the noun	Vieux	Vieux	Vieille	Vieilles
Pretty** goes before the noun	Joli	Jolis	Jolie	Jolies

Describe my dream house.

Using the conditional tense to say where you would live in the future

The conditional tense is used to describe **what someone would do** or **what would happen** in the future. It can also be used to express ambitions and intentions.

The easiest way to form the conditional tense is to take the verb *vouloir* (to want) in the conditional tense plus an infinitive or *aimer* (to like) plus an infinitive:

For example:

Je voudrais jouer au foot

I would like to play football

J'aimerais jouer au foot

I would like to play football

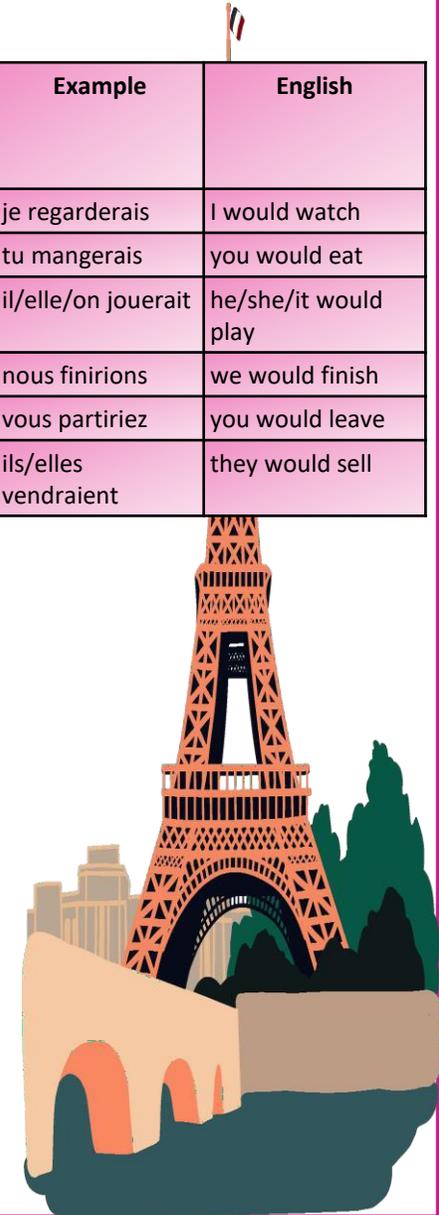
However, to conjugate verbs in the conditional tense follow these simple steps.

1. Take an infinitive. Your infinitive is the stem.

(Remember infinitives end in er, re or ir.)

2. Add the conditional tense endings. Note: these are the same endings as the imperfect tense

	Stem	Conditional endings	Example	English
je	regarder	-ais	je regarderais	I would watch
tu	manger	-ais	tu mangerais	you would eat
il/elle/on	jouer	-ait	il/elle/on jouerait	he/she/it would play
nous	finir	-ions	nous finirions	we would finish
vous	partir	-iez	vous partiriez	you would leave
ils/elles	vendre	-aient	ils/elles vendraient	they would sell



Describe my dream house.

Using the conditional tense to say where you would live in the future

The _____ tense is used to describe **what someone would do** or **what would happen** in the future. It can also be used to express ambitions and intentions.

The easiest way to form the conditional tense is to take the verb _____ (to _____) in the conditional tense plus an infinitive or aimer (to like) plus an _____:

For example:

I would like to play football

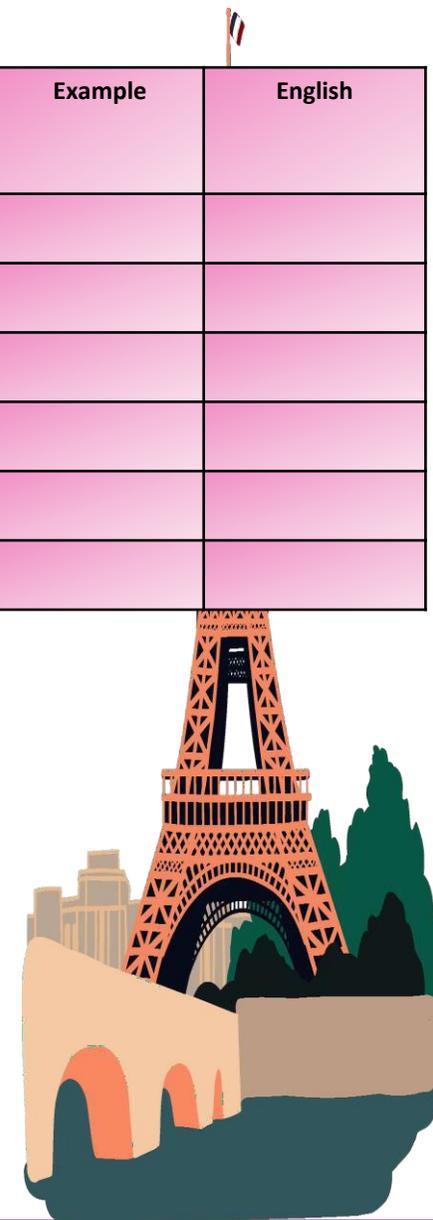
I would like to play football

However, to conjugate verbs in the conditional tense follow these simple steps.

1. Take an infinitive. Your infinitive is the _____.
(Remember infinitives end in *er*, *ir* or *re*.)

2. Add the conditional tense endings. Note: these are the same endings as the _____ tense

	Stem	Conditional endings	Example	English



Saying what I would like to do when I'm older.

If you wanted to describe a job you would like to do, you can say 'je voudrais être' (I would like to be) or 'j'aimerais être' (I would love to be) plus the name of the job.

For example, **j'aimerais** être chanteur = **I would like** to be a singer.

Remember in French you do not use the article (the/a) when talking about jobs.

For example you say: "I would like to be doctor" rather than "I would like to be a doctor".

Vocabulary - Jobs

When talking about jobs in French you have to change the ending of the word depending on the gender of the person you are talking about.

For example:

Mon père est avocat.
My Dad is a lawyer.

Ma mère est avocate.
My Mum is a lawyer.

Jobs - Masculine/Feminine

Avocat/avocate = lawyer
ingénieur/ingénieure = engineer
mécanicien/mécanicienne = mechanic
Chanteur/chanteuse = singer
traducteur/traductrice = translator
professeur = teacher
acteur/actrice = actor
vendeur/vendeuse = sales assistant
directeur/directrice = director
électricien/électricienne = electrician
médecin = doctor
Dentiste = dentist



Saying what I would like to do when I'm older.

If you wanted to describe a job you would like to do, you can say 'je voudrais être' (_ _ _ _ _) or 'j'aimerais être' (I would love to be) plus the name of the job.

For example, _____ = **I would like** to be a singer.

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Jobs - Masculine/Feminine

= lawyer

= engineer

= mechanic

= singer

= translator

= teacher

= actor

= sales assistant

= director

= electrician

= doctor

= dentist



When forming the perfect tense for some verbs, you need to use **ÊTRE** as the auxiliary verb instead of **AVOIR**

Examples of verbs that take être are aller (to go), sortir (to go out).

RECAP of the auxiliary verb Être = to be

	I am
	You are(singular/informal)
	He is
	She is
	One is (we are)
	We are
	You are (formal/plural)
	They are (masculine/mixed)
	They are (feminine)

In French you do not say "I went" instead you say "I am gone".

Je suis allé

I am gone (e.g. I went)

Il est allé

He is gone (e.g. he went)

To make it even trickier, the past participle agrees with the person using it.

Verb	Masculine	Feminine
ALLER (to go)		
SORTIR (to go out)		



Verbs: Using être in le passé composé

Le passé composé has 3 parts:

subject + auxiliary verb + past participle of verb

E.g. **Je suis né** en 1990 = I was born in 1990

Only two auxiliary verbs are used: **AVOIR** (to have) and **ÊTRE** (to be), conjugated to **PRESENT** tense and agrees w/subject

Most past participle verbs use avoir as the auxiliary verb.

The verbs that use être are «motion/movement» verbs & can be remembered by the mnemonic:

DR & MRS VANDERTRAMP

	Present	Meaning	Past Participle
D		To descend	
R		To come back	
M		To die	
R		To go back	
S		To go out	
V		To come	
A		To arrive	
N		To be born	
D		To become	
E		To enter	
R		To go (home)	
T		To fall	
R		To stay	
A		To go	
M		To go up	
P		To leave	

Note: irregular conjugated pp. endings are marked in white

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Year 9 Spanish:

Tener (To have) Present tense

Tengo	I have
Tienes	You have
Tiene	He/She/It has
Tenemos	We have
Tenéis	You (plural) have
Tienen	They have



How to form the immediate future tense:

To say what you are going to do, you can use the near immediate future tense.

This is formed by using the correct part of the verb **ir** (to go), plus the infinitive of another verb.

Voy a ir al cine

I am going to go to the cinema

Va a jugar al fútbol

He is going to play football

Ser (To be) Present tense

Soy	I am
Eres	You are
Es	He/She/It is
Somos	We are
Sois	You (plural) are
Son	They are

Ir (To go) Present tense

Voy	I go
Vas	You go
Va	He/She/It goes
Vamos	We go
Vais	You (plural) go
Van	They go

Ir (to go)

Preposition

Infinitive

Voy (I am going)

Vas (you are going)

Va (he/she is going)

Vamos (we are going)

Van (we are going)

a

Jugar - to play

Ver - to see

Hacer - to do

Montar - to ride

Ser - to be

Tener - to have

Year 9 Spanish:

Tener (To have) Present tense

I have

You have

He/She/It has

We have

You (plural) have

They have



Ser (To be) Present tense

I am

You are

He/She/It is

We are

You (plural) are

They are

Ir (To go) Present tense

I go

You go

He/She/It goes

We go

You (plural) go

They go

How to form the immediate future tense:

To say what you are going to do, you can use the near immediate future tense.

This is formed by using the correct part of the verb **ir** (to go), plus the infinitive of another verb.

I am going to go to the cinema

He is going to play football

Ir (to go)

Preposition

Infinitive

(I am going)

(you are going)

'he/she is going)

(we are going)

(we are going)

a

- to play

to see

- to do

- to ride

- to be

- to have

Year 9 Spanish: Preterite tense

Grammar Explanation

The preterite tense is used to describe **completed actions in the past**. For example:

- *Fui al cine ayer* (I went to the cinema yesterday).
- *Viajamos en tren* (We travelled by train).

The preterite tense is used if the past action had a definite beginning and definite end and is often used with phrases that give a specific time frame, eg:

- *ayer* (yesterday)
- *anteayer* (the day before yesterday)
- *anoche* (last night)
- *el año pasado* (last year)
- *el mes pasado* (last month)
- *la semana pasada* (last week)

There is a three-step method that will make conjugating regular Spanish verbs very easy for you.

1. Take the infinitive (full verb)
2. Cut off the **-ar -er** or **-ir** to form the stem
3. Add the endings

Example: I spoke = 1) hablar 2) hablar = habl 3) habl + é
= **hablé**

Regular preterite tense verb endings

English subject pronoun	Spanish subject pronoun	AR ending	hablar (to speak)
I	yo	é	hablé
you	tú	aste	hablaste
he/she	él/ella	ó	habló
we	nosotros/nosotras	amos	hablamos
you (plural)	vosotros/vosotras	asteis	hablasteis
they	ellos/ellas	aron	hablaron

English subject pronoun	Spanish subject pronoun	ER/IR ending	Comer (to eat)
I	yo	í	comí
you	tú	iste	comiste
he/she	él/ella	ió	comió
we	nosotros/nosotras	imos	comimos
you (plural)	vosotros/vosotras	isteis	comisteis
they	ellos/ellas	ieron	comieron

Year 9 Spanish: Preterite tense

Grammar Explanation

The preterite tense is used to describe **completed actions in the past**. For example:

- *Fui al cine ayer* ().
- *Viajamos en tren* ().

The preterite tense is used if the past action had a definite beginning and definite end and is often used with phrases that give a specific time frame, eg:

- (yesterday)
- (the day before yesterday)
- (last night)
- (last year)
- (last month)
- (last week)

There is a three-step method that will make conjugating regular Spanish verbs very easy for you.

- 1.
- 2.
- 3.

Example: I spoke = 1) hablar 2) hablar = habl 3) habl + é
= **hablé**

Regular preterite tense verb endings

English subject pronoun	Spanish subject pronoun	AR ending	hablar (to speak)
I			
you			
he/she			
we			
you (plural)			
they			

English subject pronoun	Spanish subject pronoun	ER/IR ending	Comer (to eat)
I			
you			
he/she			
we			
you (plural)			
they			



Irregular preterite tense

	Ser / Ir To be / To go	Hacer To do / To make	Tener To have	Ver To see
(yo)	fui	hice	tuve	vi
(tú)	fuiste	hiciste	tuviste	viste
(él / ella / usted)	fue	hizo	tuvo	vio
(nosotros)	fuimos	hicimos	tuvimos	vimos
(vosotros)	fuisteis	hicisteis	tuvisteis	visteis
(ellos / ellas / ustedes)	fueron	hicieron	tuvieron	vieron

	Dar To give	Poner To put	Poder To be able	Venir To come
(yo)	di	puse	pude	vine
(tú)	diste	pusiste	podiste	viniste
(él / ella / usted)	dio	puso	pudo	vino
(nosotros)	dimos	pusimos	podimos	vinimos
(vosotros)	disteis	pusisteis	podisteis	vinisteis
(ellos / ellas / ustedes)	dieron	pusieron	podieron	vinieron





Irregular preterite tense

	Ser / Ir To be / To go	Hacer To do / To make	Tener To have	Ver To see
(yo)				
(tú)				
(él / ella / usted)				
(nosotros)				
(vosotros)				
(ellos / ellas / ustedes)				

	Dar To give	Poner To put	Poder To be able	Venir To come
(yo)				
(tú)				
(él / ella / usted)				
(nosotros)				
(vosotros)				
(ellos / ellas / ustedes)				





Describe where I live.

How to conjugate regular verbs that end in IR in the present tense.

To change a verb that ends in IR to the present tense, use the following process:

1. Take the IR ending off to form the **stem**. For example, change **vivir** to **viv**
2. Choose the correct ending. For IR verbs, the present tense endings are as follows:

Yo (I) - o

Tú (you) - es

El/Ella (he/she) - e

Nosotros (we) - imos

Vosotros (you plural) - ís

Ellos/Ellas (they) - en

Remember in Spanish the endings of verbs tell you what the tense is and the person you are talking about.

Vivir (to live) is a regular IR infinitive verb.

Spanish	English
Vivo	I live
Vives	You live
Vive	He/she/it lives
Vivimos	We live
Vivís	You (plural) live
Viven	They live

Vivo (I live) Vives (you live) Vive (He/she lives) Vivimos (We live) Viven (They live)	en (in)	un piso (a flat)	bonito (pretty) feo (ugly) grande (big) pequeño (small)	en un edificio antiguo (in an old building) en un edificio moderno (in a modern building)
		una casa (a house)	bonita (pretty) fea (ugly) grande (big) pequeña (small)	en el centro (in the centre) en las afueras (on the outskirts) en la costa (on the coast) en el campo (in the country) en la montaña (in the mountains)
		una aldea (a village) un pueblo (a town) una ciudad (a city)	en el norte de (in the north of) en el este de (in the east of) en el sur de (in the south of) en el oeste de (in the west of)	Escocia (Scotland) Inglaterra (England) España (Spain) Irlanda (Ireland) Gales (Wales) los Estados Unidos (the USA)





Describe where I live.

How to conjugate regular verbs that end in IR in the present tense.

To change a verb that ends in IR to the present tense, use the following process:

1. Take the IR ending off to form the **stem**. For example, change _____ to _____
2. Choose the correct ending. For IR verbs, the present tense endings are as follows:

- (I) -
- (you) -
- (he/she) -
- (we) -
- (you plural) -
- (they) -

Remember in Spanish the endings of verbs tell you what the tense is and the person you are talking about.

Vivir (_____) is a regular IR infinitive verb.

Spanish	English
	I live You live He/she/it lives
	We live You (plural) live They live



Rooms of the house

En mi casa hay = in my house there is

En la casa de mis sueños habría = In my dream house there would be

Una cocina = a kitchen

Un comedor = a dining room

Un desván = an attic

Una sala de juegos = a games room

Un salón = a living room

Un sótano = a basement

Un dormitorio = a bedroom

Un cuarto de baño = a bathroom

Un garaje = a garage

Un jardín = a garden



Adjectives:

acogedor/a = cosy

antiguo/a = old

bonito/a = beautiful/pretty

luminoso/a = well lit

grande = big

pequeño/a = small

In Spanish adjectives usually come **after the noun**. Adjectives also change based on the **gender** of the noun:

Masculine:

Un piso pequeño

A small flat

Feminine:

Una casa pequeña

A small house

Remember in Spanish all nouns have a gender. A noun is a person, place or thing.

All nouns in Spanish have a gender. That means they are either masculine or feminine.

Although it might seem strange at first that nouns have a gender in Spanish, there are luckily lots of patterns and clues to help you to remember if a noun is masculine or feminine.

Rooms of the house

En mi casa hay = in my house there is

En la casa de mis sueños habría = In my dream house there would be

= a kitchen

= a dining room

= an attic

= a games room

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= a garden



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Although it might seem strange at first that nouns have a gender in Spanish, there are luckily lots of patterns and clues to help you to remember if a noun is _____ or feminine.

Year 9 Spanish:

Masculine nouns

Most nouns that end in -o are masculine.

For example:

el teléfono - telephone

el perro - dog

Male family members are always masculine.

For example:

hermano - brother

padre - father

Days of the week and months are also masculine.

For example:

lunes - Monday

diciembre - December

Feminine nouns

Most nouns that end in -a are feminine.

For example:

la casa - house

la pierna - leg

Female family members are always feminine.

For example:

hermana - sister

madre - mother

There are also some groups of endings that are always feminine.

For example:

-ión - estación - station

-dad - universidad - university

-tad - dificultad - difficulty

Another way to tell the gender of a noun is to look at its article. The words "a" and "the" are articles in English.

Articles in Spanish

	A	The	My
Masculine	Un	El	Mi
Feminine	Una	La	Mi
Masculine Plural	Unos	Los	Mis
Feminine Plural	Unas	Las	Mis

Describing where you live

There are two verbs for '**to be**' in Spanish, **ser** and **estar** that you can use to talk about where you live. **Ser** is used to give **descriptions** and **estar** is used for **location**.

For example:

•**Ser** **Mi pueblo es grande** - My town *is* big.

•**Estar** **Mi pueblo está lejos de Manchester** - My town *is* far from Manchester.

Spanish	English
Soy	I am
Eres	You are
Es	He/she/it is
Somos	We are
Sois	You (plural) are
Son	They are

Year 9 Spanish:

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Most nouns that end in -o are masculine.

For example:

- telephone
- dog

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For example:

- brother
- father

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- leg

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Masculine Plural			
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For example:

•Ser

- My town *is* big.

•Estar

- My town *is* far from Manchester.

Spanish	English
	I am You are He/she/it is
	We are You (plural) are They are



Describing location

You can give more details about where you live by using **está** (is).

For example:

• **Vivo en una ciudad pequeña. Está en la costa y está cerca de Aberdeen** - I live in a town. *It is* on the coast and *is* near to Aberdeen.

• **Vivo en un pueblo en la montaña. Está lejos de la capital** - I live in a village in the mountains. *It is* far from the capital.

Use the table below to give more detail about where you live.

Spanish	English
está	it is
cerca de	near to
lejos de	far from
en la costa	on the coast
en la montaña	in the mountains
en el campo	in the countryside
en el centro	in the centre
en el norte/sur/este/oeste	in the north/south/east/west

Describe my dream house.

The conditional tense is used to describe what someone would do or what would happen in the future. It can also be used to express ambitions and intentions. For example:

Si fuera posible viviría en una casa grande y la casa tendría una piscina.
If it were possible I would live in a big house and the house would have a swimming pool.

How to form the conditional tense.

To conjugate verbs in the conditional tense follow these simple steps.

1. Take an infinitive.

(Remember infinitives end in ar, er or ir.)

2. Add the conditional tense endings. The endings are the same for -ar, -er and -ir verbs.

	ending	vivir (to live)	meaning
yo (I)	ía	viviría	I would live
tú (you)	ías	vivirías	You would live
él/ella (he/she)	ía	viviría	He/She would live
nosotros (we)	íamos	viviríamos	We would live
vosotros (you plural)	íais	viviríais	You (plural) would live
ellos/ellas (they masculine / they feminine)	ían	vivirían	They would live

Some verbs like tener (to have) are irregular verbs. This means they don't always follow the same pattern as other verbs. To change tener (to have) to the conditional tense you use the irregular stem **tendr** plus the endings above. For example - I would have = **tendría**



Describing location

You can give more details about where you live by using **está** (is).

For example:

- I live in a town. *It is* on the coast and *is* near to Aberdeen.

- I live in a village in the mountains. *It is* far from the capital.

Use the table below to give more detail about where you live.

Spanish	English
	it is
	near to
	far from
	on the coast
	in the mountains
	in the countryside
	in the centre
	in the north/south/east/west

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The conditional tense is used to describe what someone would do or what would happen in the future. It can also be used to express ambitions and intentions. For example:

If it were possible I would live in a big house and the house would have a swimming pool.

How to form the conditional tense.

To conjugate verbs in the conditional tense follow these simple steps.

1. Take an infinitive.

(Remember infinitives end in ar, er or ir.)

2. Add _____ . The endings are the same for ____, ____ and ____ verbs.

	ending	vivir (to live)	meaning

Some verbs like tener (to have) are _____ verbs. This means they don't always follow the same _____ as other verbs. To change tener (to have) to the conditional tense you use the irregular stem **tendr** plus the endings above. For example - I would have = _____



Saying what I would like to do when I'm older.

Vocabulary - Jobs

When talking about jobs in Spanish you have to change the ending of the word depending on the gender of the person you are talking about.

For example:

Mi padre es abogado.

My Dad is a lawyer.

Mi madre es abogada.

My Mum is a lawyer.

Masculine	Feminine
Abogado = lawyer	Abogada = lawyer
Cocinero = chef	Cocinera = chef
Enfermero = nurse	Enfermera = nurse
Fontanero = plumber	Fontanera = plumber
Ingeniero = engineer	Ingeniera = engineer
Mecánico = mechanic	Mecánica = mechanic
Médico = doctor	Médica = doctor
Profesor = teacher	Profesora = teacher
Traductor = translator	Traductora = translator
Intérprete = interpreter	Intérprete = interpreter

Si pudiera elegir, = If I were able to choose,	me gustaría= I would like	ser = to be	abogado/a = lawyer cocinero/a = chef enfermero/a = nurse fontanero/a = plumber ingeniero/a = engineer mecánico/a = mechanic médico/a = doctor profesor/a = teacher traductor/a = translator intérprete = interpreter
Si tuviera la opción, = If I were to have the choice,	quisiera = I would like		
Si fuera posible, = If it were possible,	quiero = I want		
Quando sea mayor = When I'm older,			



Remember in Spanish you **do not** use the article (the/a) when talking about jobs.

For example you say: "I would like to be doctor" rather than "I would like to be a doctor".



Saying what I would like to do when I'm older.

Vocabulary - Jobs

When talking about jobs in Spanish you have to change the ending of the word depending on the _____ of the person you are talking about.

For example:

My Dad is a lawyer.

My Mum is a lawyer.

Masculine	Feminine
= lawyer	Abogada =
= chef	Cocinera =
= nurse	Enfermera =
= plumber	Fontanera =
= engineer	Ingeniera =
= mechanic	Mecánica =
= doctor	Médica =
= teacher	Profesora =
= translator	Traductora =
= interpreter	Intérprete =

= If I were able to choose,	like	= I would	= to be	abogado/a = cocinero/a = enfermero/a = fontanero/a = ingeniero/a = mecánico/a = médico/a = profesor/a = traductor/a = intérprete =
= If I were to have the choice,	like	= I would		
= If it were possible,		= I want		
= When I'm older,				



Remember in Spanish you **do not** use the article (the/a) when talking about jobs.

For example you say: "I would like to be doctor" rather than _____

Music



Helping every person achieve things they never thought they could.

Treble Clef Pitch



Treble Clef



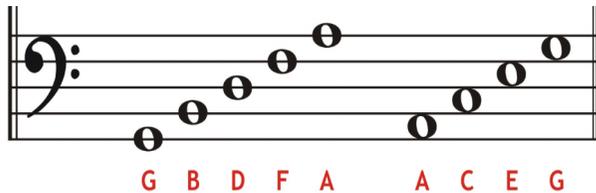
Bass Clef



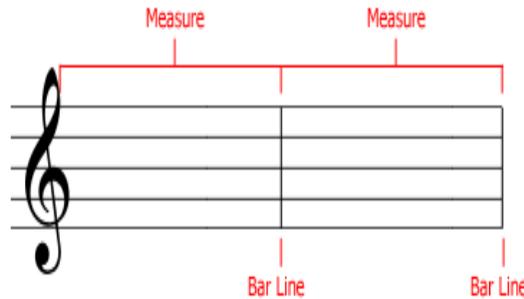
Duration of Notes

Note	Name	Beats
	Semi Breve	4 beats
	Minim	2 beats
	Crotchet	1 beat
	Quaver	1/2 beat
	Semi Quaver	1/4 beat

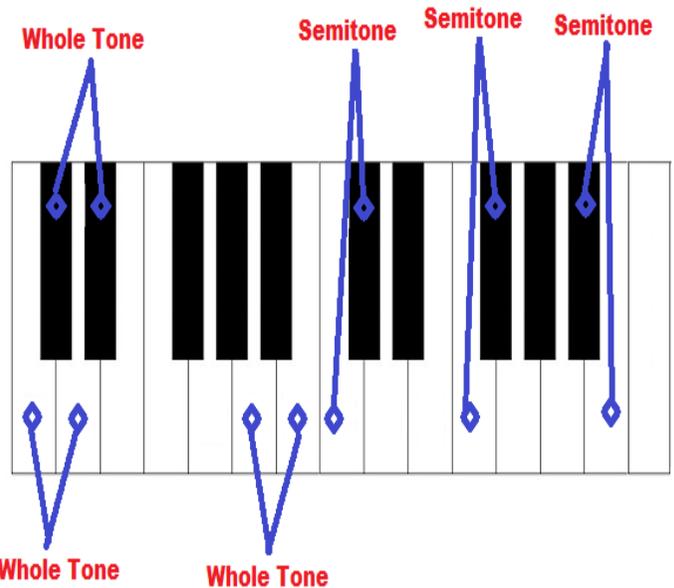
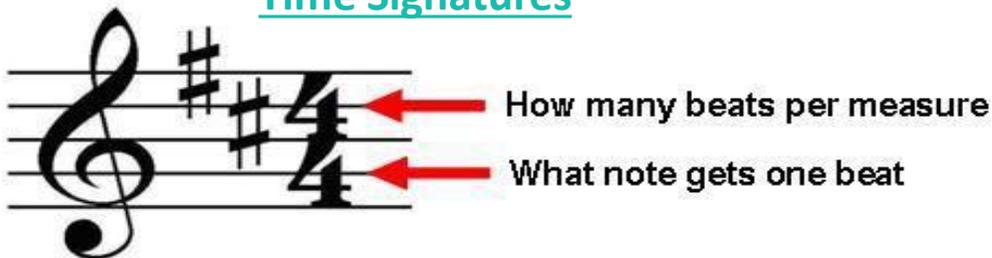
Bass Clef Pitch



Traditional Notation



Time Signatures



Treble Clef Pitch



Treble Clef



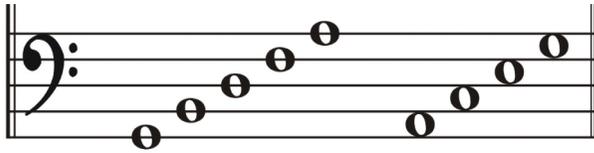
Bass Clef



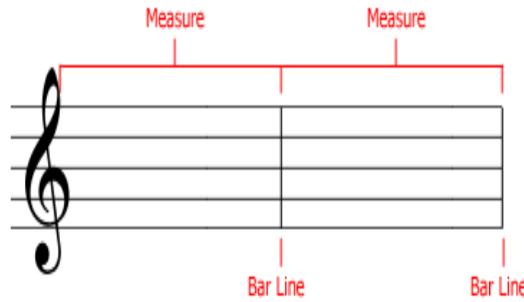
Duration of Notes

Note	Name	Beats

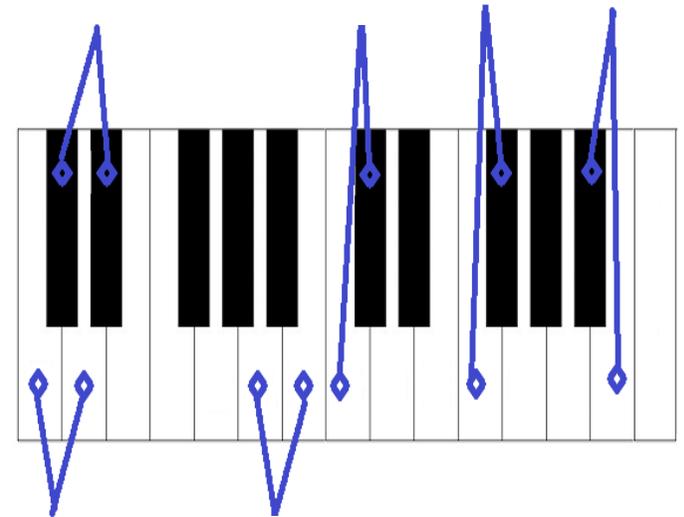
Bass Clef Pitch



Traditional Notation



Time Signatures



Year 9 Music:

1	Atonal	Music that lacks a tonal centre and tends to have an unsettling effect.
2	Cue	musical segments created specifically for moments in a film.
3	Cuesheet	A detailed listing of musical cues matching the visual action of a film so that composers can time their music accurately to match the visual images.
4	Diegetic Music	A detailed listing of musical cues matching the visual action of a film so that composers can time their music accurately to match the visual images.
5	Discordant	conflicting musical notes that clash or are harsh sounding.
6	Foley	A means of supplying additional sound effects, and matching them to visuals.
7	Imitation	This is when a melody in a polyphonic texture is repeated shortly after its first appearance in a different voice, usually at a different pitch.
8	Leitmotif	use of a musical phrase to identify with a particular character, place or idea.
9	Mickey Mousing	use of a musical phrase to identify with a particular character, place or idea.
10	Nondiegetic Music	Where the source of a sound is not visible on the screen i.e..background music.
11	Pedal Note	A long held note, used to create tension
12	Soundtrack	The music and sound recorded on a motion picture film. The word 'soundtrack' can often mean a commercial recording of a collection of music and songs from a film sold individually as an audio CD.
13	Underscore	musical accompaniment to dialogue.



Hans Zimmer, born in Germany, is a leading film composer who has written film scores for *The Lion King*, *Gladiator*, *The Batman Trilogy*, *Inception*, *The Simpsons Movie* and *Interstellar*. He has won multiple awards for his work, including an Academy Award, Golden Globes, Grammy Awards and Classical Brit Awards.

John Williams

John Williams was born in New York, USA, in 1932. He attended the Juilliard School for drama, music and art in Manhattan, New York.

His first major success was for the film score for *Jaws* in 1975 for which he won an Oscar. Williams has composed some of the most iconic film music of all time, including for *Superman*, *Indiana Jones*, *E.T.*, *Harry Potter*, *Home Alone* and *War Horse*. He has composed music for over a hundred films and is still actively composing today. His music features in the latest Star Wars trilogy.



Year 9 Music:

1	Atonal	
2	Cue	
3	Cuesheet	
4	Diegetic Music	
5	Discordant	
6	Foley	
7	Imitation	
8	Leitmotif	
9	Mickey Mousing	
10	Nondiegetic Music	
11	Pedal Note	
12	Soundtrack	
13	Underscore	



Hans Zimmer, born in _____, is a leading film composer who has written film scores for The Lion King, _____, The Batman Trilogy, _____, The Simpsons Movie and Interstellar. He has won multiple awards for his work, including an Academy Award, Golden Globes, _____ Awards and Classical _____ Awards.

John Williams

John Williams was born in ___ York, USA, in 19__ . He _____ the Juilliard School for drama, music and ___ in Manhattan, New York.

His first major success was for the _____ score for _____ in 1975 for which he won an Oscar.

Williams has composed some of the most iconic _____ music of all time, including for Superman, Indiana Jones, E.T., _____, Home Alone and ___ Horse. He has composed music for over a _____ films and is still actively composing today. His music features in the latest _____ Wars



Year 9 Music:

Song Structure

Song structure refers to how a song is organized, using a combination of different sections. A typical song structure includes a verse, chorus, and bridge in the following arrangement:

intro — verse — chorus — verse — chorus — bridge — chorus — outro

This is known as an ABACB structure, where **A** is the

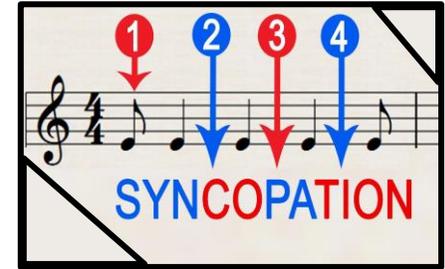
verse, **B** is the **chorus** and **C** is the **bridge**.

VERSE	CHORUS	VERSE	CHORUS	BRIDGE	CHORUS
A	B	A	B	C	B

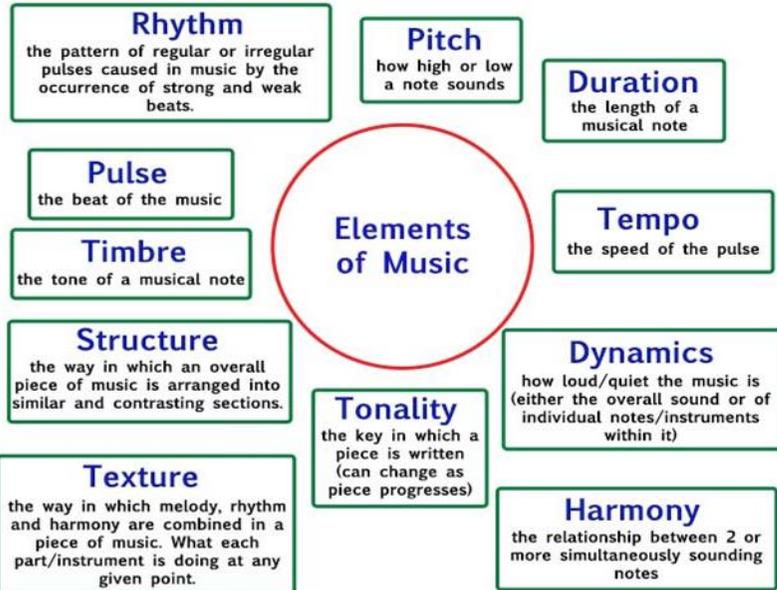
Syncopation

In music, syncopation is the placement of rhythmic stresses or accents on non-important beats, where they normally wouldn't occur.

It can do this by highlighting certain "off" beats, or by putting a rest where normally an "on" beat would be.



Elements Of Music



www.musictheoryacademy.com

Quantisation

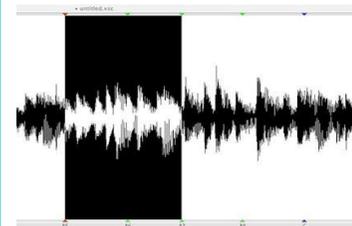
Simply put, Quantisation snaps your notes into place to the grid, meaning they are always in time with the music, it's like waving a magic wand & fixing your parts!



Sampling

"In music, sampling is the act of taking a portion, or sample, of one sound recording and reusing it as an instrument or element of a new recording.

This is typically done with a sampler, which can be a piece of hardware or a computer program on a digital computer"

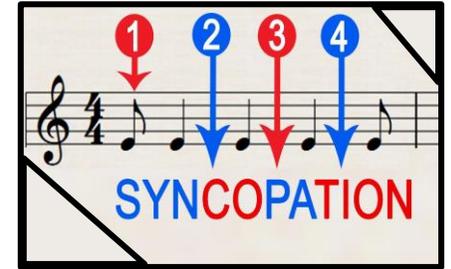


Year 9 Music:

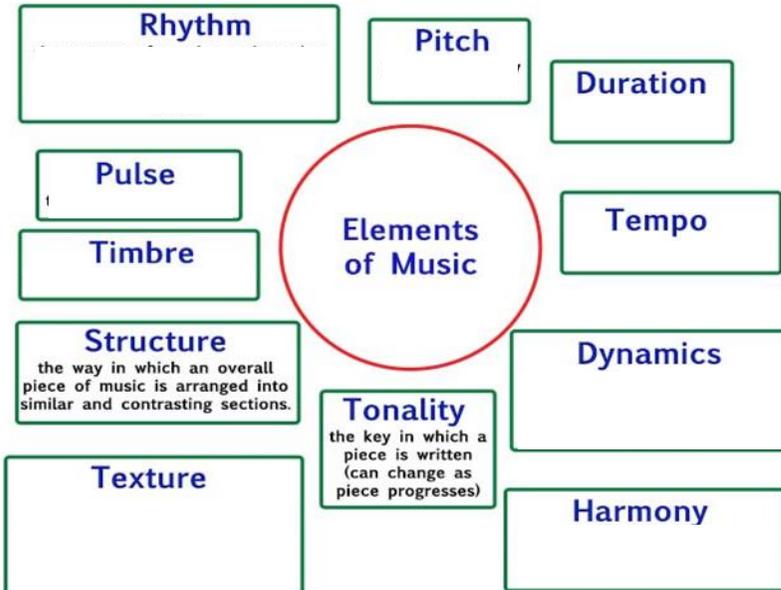
Song Structure

VERSE	CHORUS	VERSE	CHORUS	BRIDGE	CHORUS
A	B	A	B	C	B

Syncopation



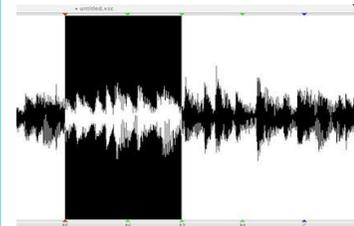
Elements Of Music



Quantisation



Sampling



PE



Helping every person achieve things they never thought they could.

Motor Competence

Passing

Chest pass, bounce pass, shoulder pass

Receiving

Catching with two hands, catching whilst moving.

Dribbling

Fingertips, head up, bounce the ball in front of body

Possession

Keeping the ball away from opponents, using body to protect the ball. Dribble if there's space, pass if a teammate is in space

Defending

Rebounding, Zonal defence (marking the space rather than the player)

Shooting

Composure, accuracy and placement. Lay up - use outside arm, use fingers to create backspin, aim for the postage stamp



Key

The area shaped like a keyhole at both ends of the court which included the free throw line.

3-point Line

If you shoot from outside the 3 point line, it is worth 3 points instead of 2

Contact

No contact is to be made with the player touching the ball. If it does a side line is taking to the team the foul was against.

Double Dribble

Dribbling with two hands or dribbling, catching the ball, then dribbling again

3 Second Violation

The attackers can't stay in the key for more than 3 seconds.

8 Second Violation

Players have 8 seconds to get the ball over the halfway line. If they don't they lose possession of the ball.

Back Court Violation

Once over the halfway line the attackers can not pass the ball back over the halfway line otherwise they lose possession of the ball.

Healthy Participation

Muscles

Deltoids, biceps, triceps, hamstrings, quadriceps

Fitness components

Hand-eye coordination, speed, agility, reaction time





Motor Competence

Passing

Receiving

Dribbling

Possession

Defending

Shooting



Key

3-point Line

Contact

Double Dribble

3 Second Violation

8 Second Violation

Back Court Violation



Healthy Participation

Which **muscles** are used in basketball?

What are the **fitness components** of basketball?



Year 9 PE: Handball



Rules, Strategies and Tactics

Motor Competence

Passing	Use fingertips for control, weight on front foot with dominant hand and foot at the back. See it out.
Receiving	Get in line, make space away from defender, arms out and see it in.
Dribbling	Use your fingertips, knees slightly bent, keep your head up. Try to use alternate hands as an advanced technique
Possession	Dribble if you have space, pass if a teammate is in a better position. PIVOT to look for options
Defending	Jump block and shutting down the space, communicating with teammates
Shooting	Raising the arm and moving the shoulder back, bending the elbow and rotating the body for power. Jump shot - same motion but jumping to add power



Contact

Contact can only be made when front-on. Any contact from the side or behind is a foul

Free Throw

A free throw is given for infringement on the rules, defenders must stand 3 metres away from the thrower

Penalty Throw

Given if a foul occurs when shooting or if a defender enters their own area

Corner Throw

Given if the ball goes behind the goal off the defender (not including the goalkeeper)

Passing

You must pass with one hand

Double Dribbling

You cannot dribble with both hands, you cannot move more than 3 steps with the ball in your hand. You must pass or shoot if you stop dribbling. You cannot hold the ball for more than 3 seconds.

Healthy Participation

Muscles

Deltoids, biceps, triceps, hamstrings, quadriceps

Fitness components

Hand-eye coordination, speed, agility, reaction time



Year 9 PE: Handball



Rules, Strategies and Tactics

Motor Competence

Passing

Receiving

Dribbling

Possession

Defending

Shooting



Contact

Free Throw

Penalty Throw

Corner Throw

Passing

Double Dribbling

Healthy Participation

Muscles

Fitness components



Year 9 PE: Leadership

Rules, Strategies and Tactics

Motor Competence



Understanding what a sports leader is

Someone in charge of a team, they are creative, reliable, punctual, confident and have good communication skills

Roles of a Sports Leader

Role model, motivator, planner, Instructor, Mentor, Advisor, Councillor, Demonstrator, Organiser.

Responsibilities of a Sports Leader

Knowledge of activity, enthusiasm for activity, knowledge of safety, knowledge of child protection issues,



Appropriate use of equipment

We should consider what equipment we need and only use what is necessary. Equipment should be used without the risk of damaging when creating activities with them.

Planning a session

Consider the equipment available, considers the space needed and how many participants there are. Link the activity to the purpose of it. Consider timings

Delivery of a session

Be confident, organised, punctual, keep it structured and motivate participants.

Orienteering

Use map appropriately, don't move or damage any of the equipment. Try to complete the course as quickly as possible

Designing a lesson plan

Consider a warm up, main activity and game. Consider what space will be used, what equipment will be used and the safety precautions involved.

Warm Up

Involves a pulse raiser, dynamic stretches and a skill-based activity. Prepares participants physically and mentally. Helps to prevent injury.

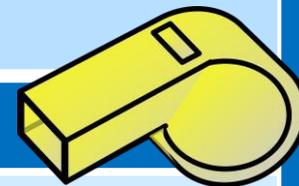
Muscles used when orienteering

Hamstrings, quadriceps, gastrocnemius

Cool Down

Light jog into a walk followed by static stretches. This prevents lactic acid building up in the muscles

Healthy Participation



Orienteering

Using a map and a compass to navigate between checkpoints. Leaders should find the best route to take

Year 9 PE: Leadership

Rules, Strategies and Tactics

Motor Competence



Understanding what a sports leader is

Roles of a Sports Leader

Responsibilities of a Sports Leader

Appropriate use of equipment

Planning a session

Delivery of a session

Orienteering



Healthy Participation



Designing a lesson plan

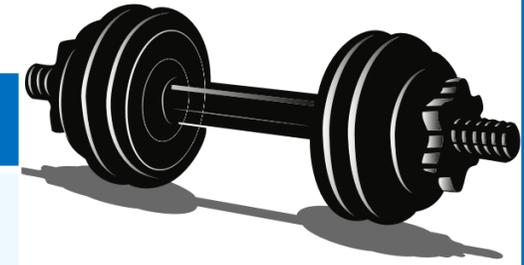
Warm Up

Muscles used when orienteering

Cool Down

Orienteering

Motor Competence



Muscular strength

The amount of force you can put out or the amount of weight you can lift.

Muscular Endurance

Perform exercises to failure so that you improve your muscular endurance.

Speed

Moving your body fast as possible

Agility

Changing direction rapidly, whilst maintaining speed and precision.

Flexibility

A joint or series of joints to move through an unrestricted, pain free range of motion.

Balance

Even distribution of weight enabling someone or something to remain upright and steady.

Coordination

Throw with one hand, catch with the other.

Reaction time

How fast an athlete is able to respond to a stimulus.

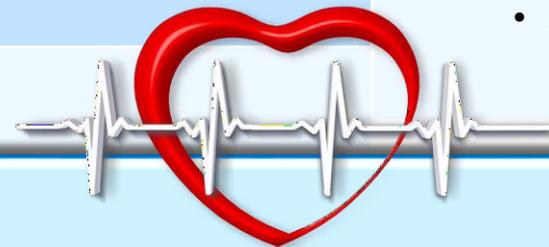
Cardiovascular Fitness

To exercise the whole body for long periods

Healthy Participation

Muscles commonly used in the lesson:

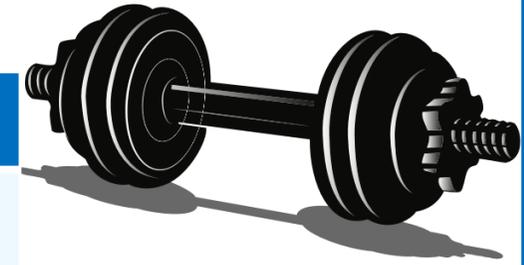
- Gluteal
- Hamstrings
- Quadriceps
- Gastrocnemius
- Abdominals



Rules, Strategies and Tactics

All of the movements completed to improve agility and speed must use the **correct technique** as this would stop any injuries or muscular injuries occurring.

All participants must have **warmed up** their muscles before completing flexibility and balance skills as if not muscles can easily be torn or damaged.



Motor Competence- define the terms below.

Muscular strength

Muscular Endurance

Speed

Agility

Flexibility

Balance

Coordination

Reaction time

Cardiovascular Fitness

Healthy Participation

Muscles commonly used in the lesson:

- _____
- _____
- _____
- _____
- _____



Rules, Strategies and Tactics

All of the movements completed to improve agility and speed must use the _____ as this would stop any injuries or muscular injuries occurring.

All participants must have _____ their muscles before completing flexibility and balance skills as if not muscles can easily be torn or damaged.

Religious Education



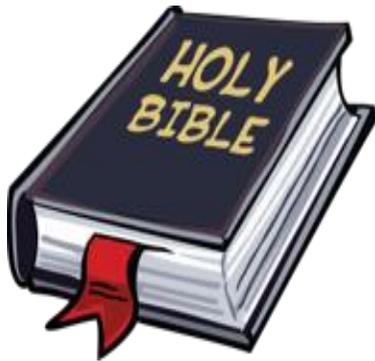
Helping every person achieve things they never thought they could.

Year 9 RE: Christianity

Christianity	The religion followed by Christians
Bible	The holy book of Christianity
Old Testament	The first part of the Bible
New Testament	The second part of the Bible
Creed	A statement of belief
Denominations	Groups or branches within the religion

Where do Christian teachings come from?

1. **The Bible** - The holy book of Christians is called the Bible. This is divided into two main parts – the **Old Testament** and the **New Testament**. The Old Testament includes the **Creation Story** and the **Ten Commandments**. The New Testament includes the **4 Gospels** of Matthew, Mark, Luke and John, which are accounts of Jesus' life.
2. **The Church** - mainly through their creeds.
3. **Theologians and philosophers** – who have studied difficult questions about religion.
4. **Individual Christians**.
5. **Different Christian denominations**. The two main branches of Christianity are Roman **Catholics** and **Protestants**.



Year 9 RE: Christianity

Christianity	
Bible	
Old Testament	
New Testament	
Creed	
Denominations	

Where do Christian teachings come from?

1. -

2. -

3. -

4. -

5. -



Christianity is a **monotheistic** religion, which means that they believe in **One God**. They believe that God has many qualities/attributes.



Key Words

Salvation – the idea that Jesus **saved** humanity from **sin** and death through his death and **resurrection**.

Sin – acting against God's will.

Original Sin – Some Christians believe this was the **first** sin, committed by Adam and Eve.

Atonement – Forgiveness, reconciliation, being **'at one'** with God.

Qualities	Meaning	Evidence from the Bible
Omnipotent	All-powerful	The creation of the world in Genesis. Miracles that Jesus performed, for example, turning water into wine.
Omni-benevolent	All-loving	Jesus' death - so that humanity could achieve salvation and atonement.
Just	Fair, treat everyone equally.	The Parable of the Sheep and Goats. The Book of Job.

Year 9 RE: Christianity

Christianity is a _____ religion, which means that they believe in _____. They believe that God has many _____/attributes.



Key Words
Salvation –

Sin –

Original Sin –

Atonement –

Qualities	Meaning	Evidence from the Bible
Omnipotent		
Omnibenevolent		
Just		

The Trinity is the Christian belief in One God, made up of three persons. The three persons of the Trinity for Christians are God the Father, God the Son (Jesus) and God the Holy Spirit. They are all equally important. Christians see the three persons of the Trinity as having different characteristics and roles.

God the Father	God the Son	God the Holy Spirit
Sustains and rules everything.	Born of the Virgin Mary.	Part of God that works within the world.
Will judge.	Performed miracles.	Helper and guide.
Continues to care for us like a father.	Rose from the dead on the third day.	Invisible power of God which breathes new life into people.
Creator	Redeemer, saviour	Provides courage and strength.

Christians believe in the Trinity because...

It is explained in the Creeds, for example, the Apostles' Creed and the Nicene Creed.

It is referred to in the Creation Story.

It is referred to when Jesus was baptised

Christians express their belief in Trinity by...

They recite the creeds.

They do the 'sign of the cross' at the beginning and end of prayers.

During baptism, water is poured over the head three times.

They celebrate Trinity Sunday.



Year 9 RE: Christianity

The Trinity is the _____ belief in One God, made up of three persons. The three persons of the Trinity for Christians are ___ the Father, God the Son (_____) and God the Holy Spirit. They are all _____ important. Christians see the _____ persons of the Trinity as having _____ characteristics and _____.

God the Father	God the Son	God the Holy Spirit

Christians believe in the Trinity because...

Christians express their belief in Trinity by...



Year 9 RE: Christianity

Day 1 and 2



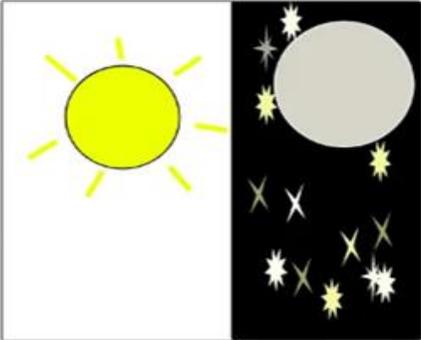
Day 1: God created the world and the universe and light was created
Day 2: the sky was created

Day 3



Day 3: Dry land, seas, trees, and plants were created

Day 4



Day 4: the Sun, moon, and stars were created

Day 5



Day 5: creatures that live in the sea and creatures that can fly were created

Day 6



Day 6: animals that live on the land and finally humans made the image of God were created

Day 7



Day 7: God finished his work of creation and rested making the seventh day a special holy day

The first book of the Bible, Genesis, says that God created everything. The process took six days and on the seventh day, God rested.

Christians see God the Father as the creator, but the Bible also describes how the other persons of the Trinity were involved.

Christians believe God the Son was present at Creation because in the Bible it refers to Jesus as the 'Word' and in John's Gospel it says, 'In the beginning was the Word'

In addition, they believe '...the Spirit hovered over the waters.' (Genesis).

Year 9 RE: Christianity

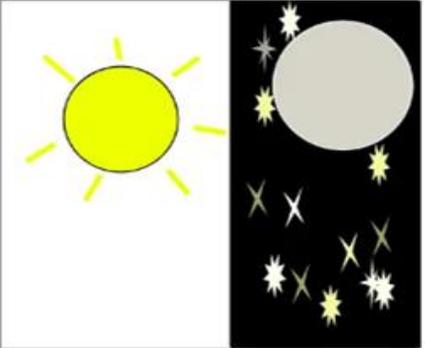
Day 1 and 2



Day 3



Day 4



Day 2: the sky was created

Day 5



Day 6



Day 7



The _____ book of the Bible, Genesis, says that _____ created everything. The process took _____ days and on the seventh day, God _____.

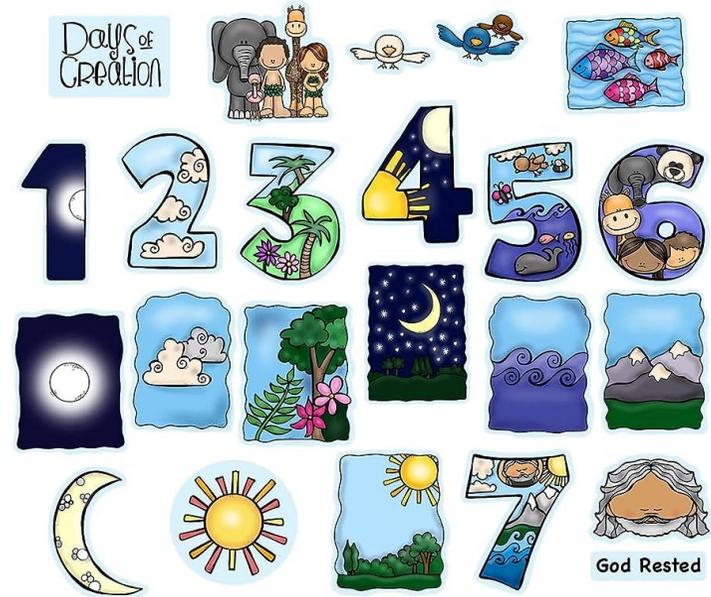
Christians see God the _____ as the _____, but the Bible also describes how the other persons of the _____ were involved.

Christians believe God the _____ was present at Creation because in the Bible it refers to Jesus as the 'Word' and in John's Gospel it says, 'In the _____ was the Word'

In addition, they believe '...the _____ hovered over the waters.' (Genesis).

Different Interpretations of the Creation Story

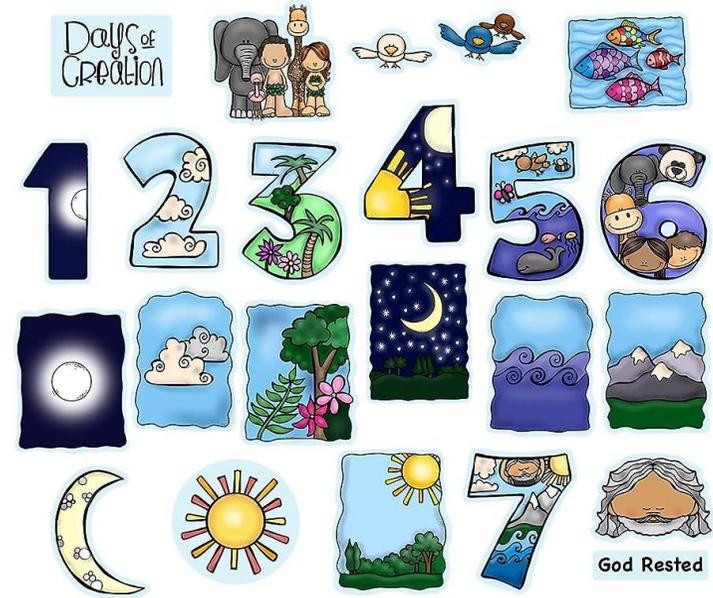
- Some Christians take the Creation story literally. They are known as **Creationists**. They believe the process took six days and humans descended from Adam and Eve.
- Other Christians believe it is metaphorical; that God may be responsible for the Big Bang and for starting the process of evolution. They would say that the Bible story is not necessarily scientifically accurate. It has a symbolic truth.
- They view Genesis as more of a parable, or a symbolic description. They acknowledge God as the creator, but are open to other theories about how God made the universe.



The creation story can help Christians to further understand God's nature. God is eternal and transcendent, as he made time and was present prior to it. He is omnipotent as he created the universe through words. God's benevolence can be seen through creation too, as he brought mankind to life and gave them the world.

Different Interpretations of the Creation Story

- Some Christians take the Creation story literally. They are known as _____. They believe the process took six days and humans descended from _____ and Eve.
- Other Christians believe it is _____; that God may be responsible for the Big Bang and for starting the process of _____. They would say that the Bible story is not necessarily _____ accurate. It has a symbolic truth.
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The creation story can help Christians to further understand God's _____. God is eternal and _____, as he made time and was present prior to it. He is _____ as he created the universe through words. God's _____ can be seen through creation too, as he brought mankind to life and gave them the world.

Year 9 RE: Islam

Islam was founded in the 7th Century.

It shares some ideas with Judaism and Christianity.

Followers of Islam are called Muslims.

Muslims believe in one God, Allah.

The main holy book for Muslims is the Qur'an.

Muslims also follow the sunnah (the way) and the teachings of the Prophet Muhammad.



The two main branches of Islam are Sunni and Shi'a .

Main Differences	Sunni	Shi'a
Leadership	Believe the Prophet's best friend, Abu Bakr, should be the caliph (successor) after the Prophet's death.	Believe the caliph should be related to the Prophet Muhammad and that Muhammad named his cousin, Ali, to be the next caliph following his death.
Beliefs	Their main beliefs are known as the Six Beliefs or Six Articles of Faith	Their main beliefs are known as the Five Articles of Faith or Five Roots.

Year 9 RE: Islam

Islam was founded in the ____ Century.
It shares some ideas with _____ and _____.
Follows of Islam are called _____.
Muslims believe in one God, _____.
The main holy book for Muslims is the _____.
Muslims also follow the _____ (the way) and the _____ of the Prophet Muhammad.



The two main branches of Islam are Sunni and Shi'a .

Main Differences	Sunni	Shi'a
Leadership		
Beliefs		

Science



Helping every person achieve things they never thought they could.

Year 9 Science: Cell division and transport

	Cytoplasm	Site of chemical reactions in the cell	Gel like substance containing enzymes to catalyse the reactions
	Nucleus	Contains genetic material	Controls the activities of the cell and codes for proteins
	Cell membrane	Semi permeable	Controls the movement of substances in and out of the cell
	Ribosome	Site of protein synthesis	mRNA is translated to an amino acid chain
	Mitochondria	Site of respiration	Where energy is released for the cell to function

animal cell

plant cell

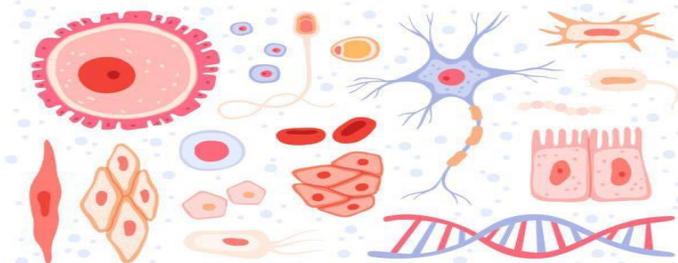
Eukaryotes complex organisms

	Permanent vacuole	Contains cell sap	Keeps cell turgid, contains sugars and salts in solution
	Cell wall	Made of cellulose	Supports and strengthens the cell
	Chloroplast	Site of photosynthesis	Contains chlorophyll, absorbs light energy

	Cell membrane	Semi permeable site of chemical reactions in the cell	Controls the movement of substances in and out of the cell
	Bacterial DNA	Not in nucleus floats in the cytoplasm	Controls the function of the cell
	Cell wall	NOT made of cellulose	Sand strengthens the cell
	Plasmid	Small rings of DNA	Contain additional genes
	Cytoplasm	Site of chemical reactions in the cell	Gel like substance containing enzymes to catalyse the reactions

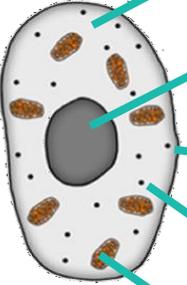
Prokaryotes simpler organisms

Nerve		Carry electrical signals	long branched connections and insulating sheath
Sperm		Fertilise an egg	streamlined with a long tail acrossome containing enzymes large number of mitochondria
Muscle		Contract to allow movement	contains a large number of mitochondria long



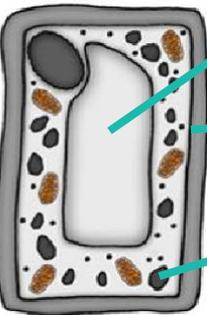
Root hair		Absorb water and minerals from soil	Hair like projections to increase the surface area
Xylem		Carry water and minerals	TRANSPIRATION - dead cells cell walls toughened by lignin. Flows in one direction
Phloem		Carry glucose	TRANSLOCATION - living cells cells have end plates with holes. Flows in both directions.

Year 9 Science: Cell division and transport

	Cytoplasm		
	Nucleus		
	Cell membrane		
	Ribosome		
	Mitochondria		

animal cell

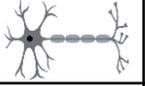
Eukaryotes complex organisms

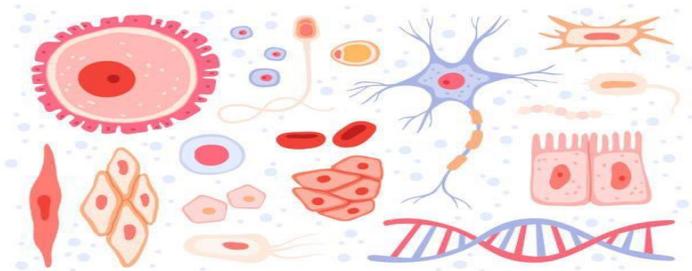
	Permanent vacuole		
	Cell wall		
	Chloroplast		

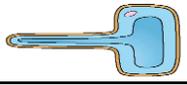
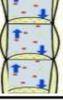
plant cell

	Cell membrane		
	Bacterial DNA		
	Cell wall		
	Plasmid		
	Cytoplasm		

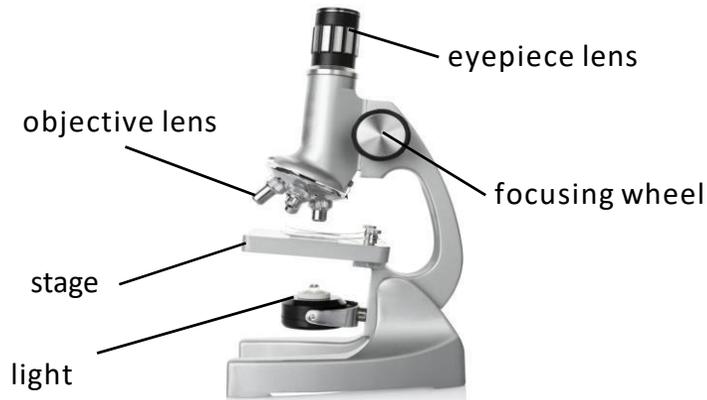
Prokaryotes simpler organisms

Nerve			
Sperm			
Muscle			



Root hair			
Xylem			
Phloem			

Year 9 Science: Cell division and transport



Feature	Light (optical) microscope	Electron microscope
Radiation used	Light rays	Electron beams
Max magnification	~ 1500 times	~ 2 000 000 times
Resolution	200nm	0.2nm
Size of microscope	Small and portable	Very large and not portable

source How a cell changes and becomes **specialised**
Undifferentiated cells are called **STEM** cells

Cell differentiation

animal cell differentiation

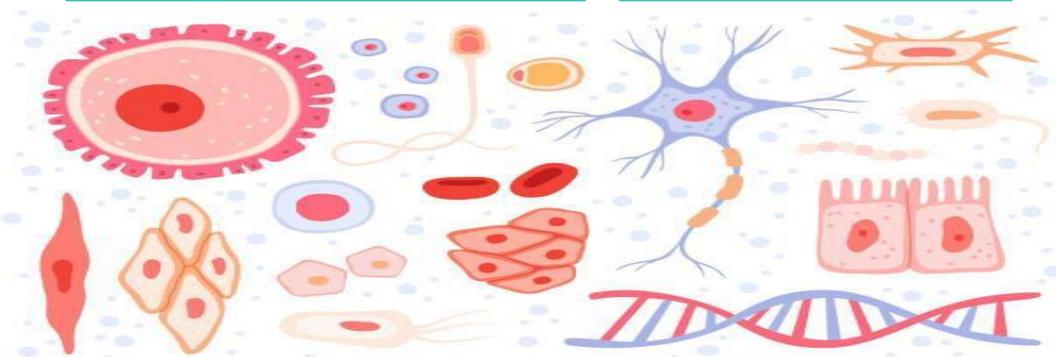
plant cell differentiation

early stages of development
 only for repair and replacement

all stages of life cycle the
 stem cells are grouped
 together in meristems

Microscopy

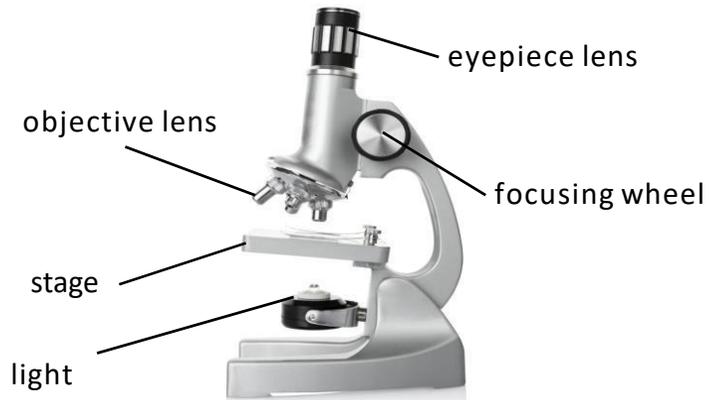
Magnification $M = \frac{\text{size of image } I}{\text{actual size } A}$



PREFIXES

Prefix	Multiple	Standard form
centi (cm)	1 cm = 0.01 m	$\times 10^{-2}$
milli (mm)	1 mm = 0.001 m	$\times 10^{-3}$
micro (μm)	1 μm = 0.000 001 m	$\times 10^{-6}$
nano (nm)	1nm = 0.000 000 001 m	$\times 10^{-9}$

Year 9 Science: Cell division and transport



Feature	Light (optical) microscope	
Radiation used	Light rays	
Max magnification	~ 1500 times	
Resolution	200nm	
Size of microscope	Small and portable	

source How a cell changes and becomes **specialised**
Undifferentiated cells are called **STEM** cells

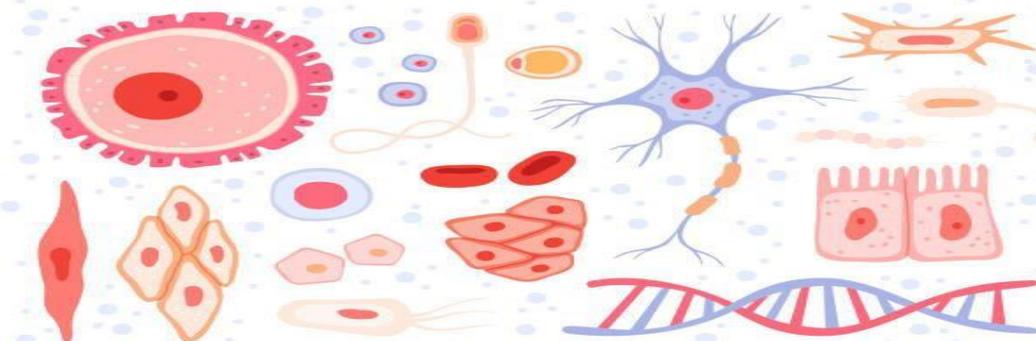
Cell differentiation

animal cell differentiation

plant cell differentiation

Microscopy

Magnification $M = \frac{\text{size of image } I}{\text{actual size } A}$



PREFIXES

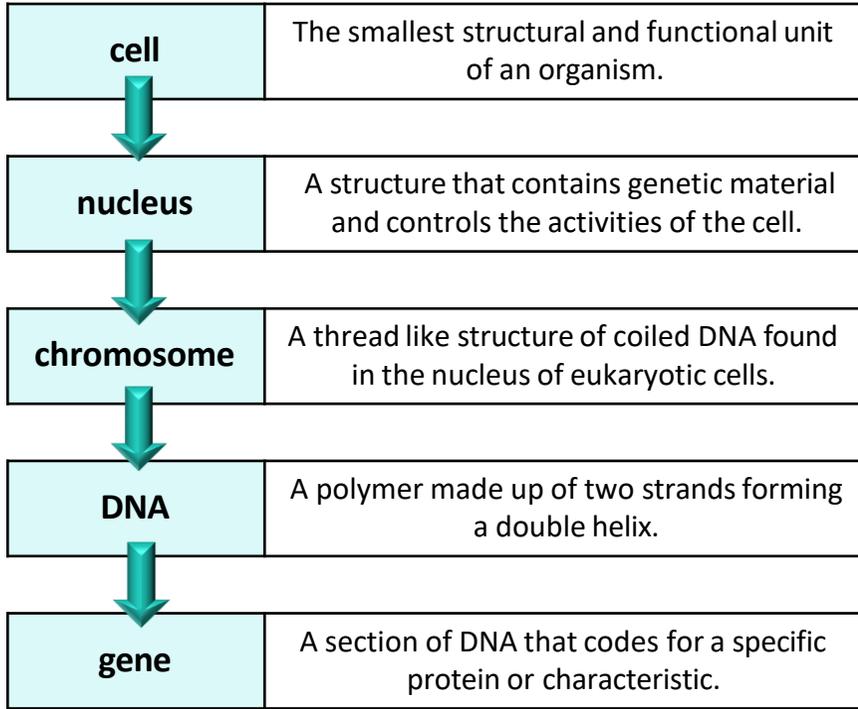
Prefix	Multiple	Standard form
	1 cm = 0.01 m	
	1 mm = 0.001 m	
	1 μm = 0.000 001 m	
	1nm = 0.000 000 001 m	

Year 9 Science: Cell division and transport

largest



smallest



Small intestines	<i>Villi – increase surface area, Good blood supply – to maintain concentration gradient, Thin membranes – short diffusion distance.</i>
Lungs	<i>Alveoli – increase surface area, Good blood supply – to maintain concentration gradient, Thin membranes – short diffusion distance.</i>
Gills in fish	<i>Gill filaments and lamella – increase surface area, Good blood supply – to maintain concentration gradient, Thin membranes – short diffusion distance.</i>
Roots	<i>Root hair cells - increase surface area.</i>
Leaves	<i>Large surface area, thin leaves for short diffusion path, stomata on the lower surface to let O₂ and CO₂ in and out.</i>

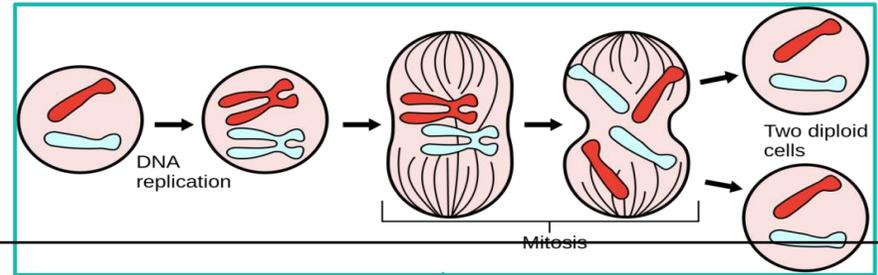
ADAPTATIONS FOR DIFFUSION

The greater the difference in concentrations the faster the rate of diffusion.

Cells divide in a series of stages. The genetic material is doubled and then divided into two identical cells.

MITOSIS AND THE CELL CYCLE

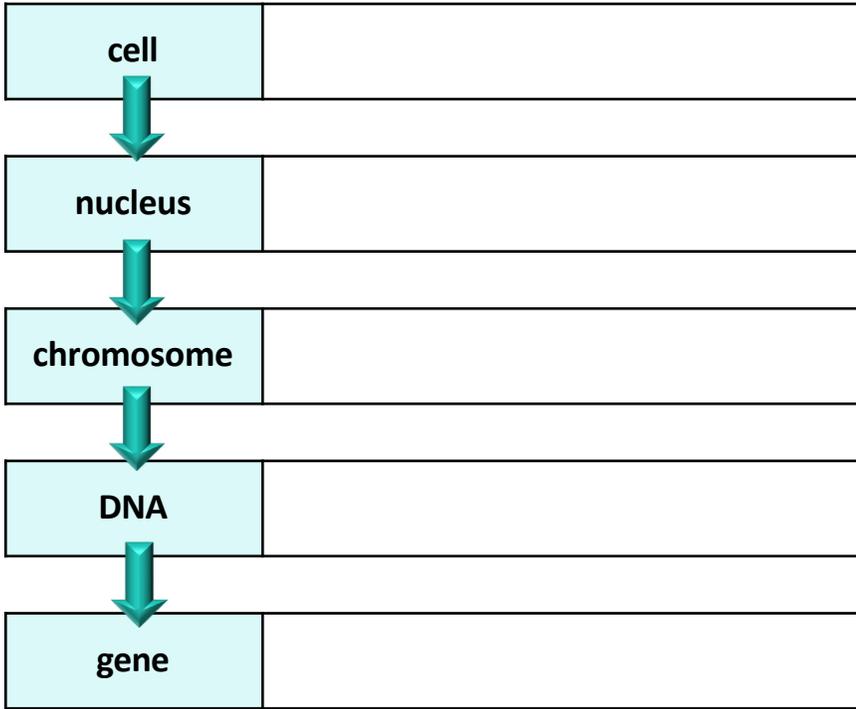
Stage 1	Growth & DNA Synthesis	Increase the number of sub-cellular structures e.g. ribosomes and mitochondria. DNA replicates to form two copies of each chromosome.
Stage 2	Mitosis	One set of chromosomes is pulled to each end of the cell and the nucleus divides.
Stage 3	Cell division	Then the cytoplasm and cell membranes divide to form two cells that are identical to the parent cell.



Mitosis occurs during growth, repair of tissue, replacement of cells. Asexual reproduction occurs by mitosis in both plants & single cell organisms.

Year 9 Science: Cell division and transport

largest



smallest

Cells divide in a series of stages. The genetic material is doubled and then divided into two identical cells.

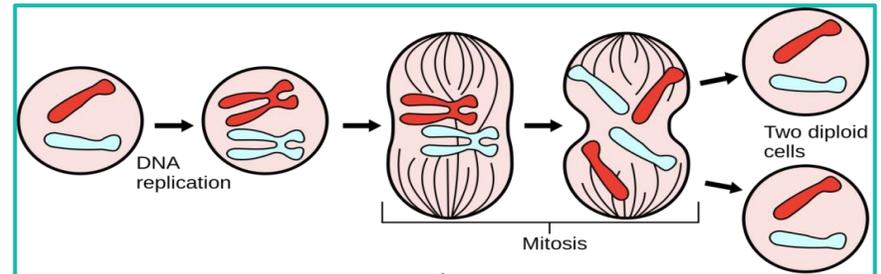
MITOSIS AND THE CELL CYCLE

Stage 1	Growth & DNA Synthesis	
Stage 2	Mitosis	
Stage 3	Cell division	

Small intestines	
Lungs	
Gills in fish	
Roots	
Leaves	

ADAPTATIONS FOR DIFFUSION

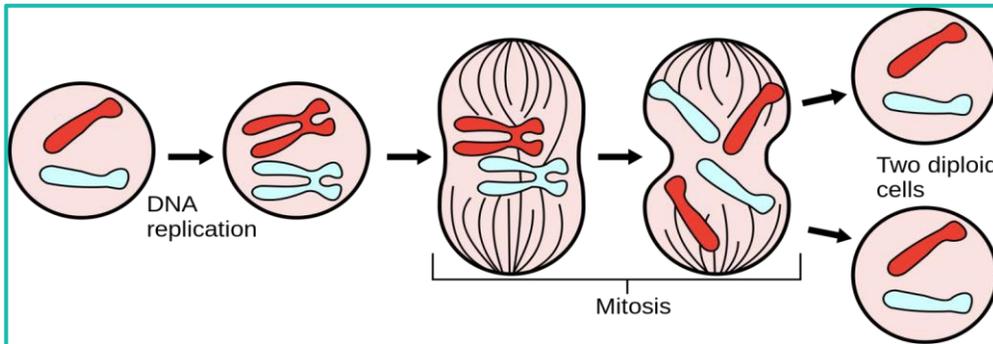
The greater the difference in concentrations the faster the rate of diffusion.



Mitosis occurs during growth, repair of tissue, replacement of cells. Asexual reproduction occurs by mitosis in both plants & single cell organisms.

Year 9 Science: Cell division and transport

Diffusion <u>No</u> energy required	Movement of particles in a solution or gas from a higher to a lower concentration	E.g. O ₂ and CO ₂ in gas exchange, urea in kidneys. Factors that affect the rate are concentration, temperature and surface area.
Osmosis <u>No</u> energy required	Movement of water from a dilute solution to a more concentrated solution	E.g. Plants absorb water from the soil by osmosis through their root hair cells. Plants use water for several vital processes including photosynthesis and transporting minerals.
Active transport ENERGY required	Movement of particles from a low concentration to a high concentration	E.g. movement of mineral ions into roots of plants and the movement of glucose into the small intestines.



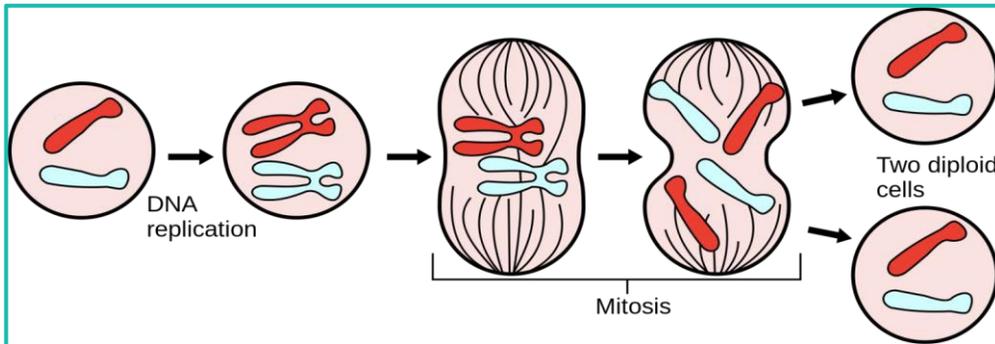
Human Embryonic stem cells	Can be cloned and made to differentiate into most cell types	Therapeutic cloning uses same genes so the body does not reject the tissue. Can be a risk of infection
Adult bone marrow stem cells	Can form some types of human cells e.g. blood cells	Tissue is matched to avoid rejection, risk of infection. Only a few types of cells can be formed.
Meristems (plants)	Can differentiate into any plant cell type throughout the life of the plant.	Used to produce clones quickly and economically, e.g. rare species, crop plants with pest/disease resistance

Treatment with stem cells may be able to help conditions such as diabetes and paralysis. Some people object to the use of stem cells on ethical or religious grounds

Year 9 Science: Cell division and transport

Diffusion <u>No</u> energy required		
Osmosis <u>No</u> energy required		
Active transport <u>ENERGY</u> required		

Human Embryonic stem cells		
Adult bone marrow stem cells		
Meristems (plants)		



Treatment with stem cells may be able to help conditions such as _____ and _____.
Some people object to the use of stem cells on ethical or religious grounds

Year 9 Science: Particle Arrangement and Change of State

Pressure of a fixed volume of gas increases as temperature increases (temperature increases, speed increases, collisions occur more frequently and with more force so pressure increases).



Temperature of gas is linked to the average kinetic energy of the particles.

If kinetic energy increases so does the temperature of gas.

No kinetic energy is lost when gas particles collide with each other or the container.

Gas particles are in a constant state of random motion.

$$P = m \div V$$

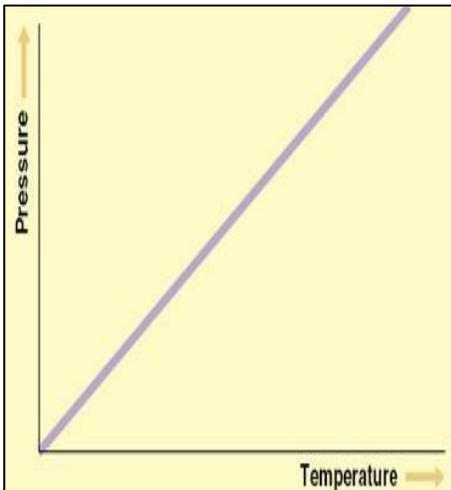
Density = mass \div volume.



Density	<i>Mass of a substance in a given volume</i>
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Kinetic theory of gases

Particle model

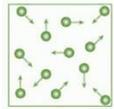
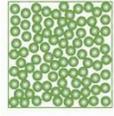


State	Particle arrangement	Properties
Solid	Packed in a regular structure. Strong forces hold in place so cannot move.	Difficult to change shape.
Liquid	Close together, forces keep contact but can move about.	Can change shape but difficult to compress.
Gas	Separated by large distances. Weak forces so constantly randomly moving.	Can expand to fill a space, easy to compress.

	Units
Density	Kilograms per metre cubed (kg/m ³)
Mass	Kilograms (kg)
Volume	Metres cubed (m ³)
Energy needed	Joules (J)
Specific latent heat	Joule per kilogram (J/kg)
Change in thermal energy	Joules (J)
Specific heat capacity	Joule per kilogram degrees Celsius (J/kg°C)
Temperature change	Degrees Celsius (°C)
Pressure	Pascals (Pa)

Year 9 Science: Particle Arrangement and Change of State

Pressure of a fixed volume of gas increases as temperature increases (temperature increases, speed increases, collisions occur more frequently and with more force so pressure increases).



State	Particle arrangement	Properties
Solid		
Liquid		
Gas		

If kinetic energy increases so does the temperature of gas.

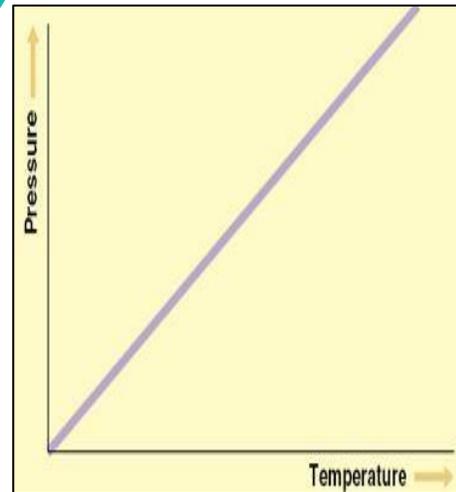
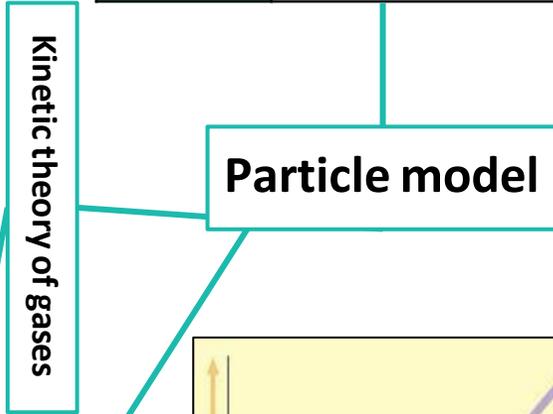
Gas particles are in a constant state of random motion.

$$P = m \div V$$

Density =

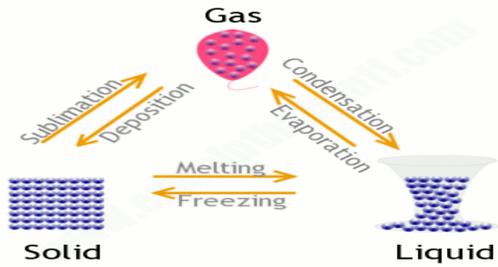


Density	
---------	--



	Units
Density	
Mass	
Volume	
Energy needed	
Specific latent heat	
Change in thermal energy	
Specific heat capacity	
Temperature change	
Pressure	

Year 9 Science: Particle Arrangement and Change of State



PHYSICS ONLY: when you do work the temperature increases e.g. pump air quickly into a ball, the air gets hot because as the piston in the pump moves the particles bounce off increasing kinetic energy, which causes a temperature rise.

Reducing the volume of a fixed mass of gas increases the pressure.
Halving the volume doubles the pressure.

$$PV = \text{constant.}$$

$$P_1V_1 = P_2V_2$$

Pressure

Internal energy and energy transfers

Specific Heat Capacity	Energy needed to raise 1kg of substance by 1°C	Depends on: <ul style="list-style-type: none"> • Mass of substance • What the substance is • Energy put into the system.
-------------------------------	---	---

Change in thermal energy = mass X specific heat capacity X temperature change.

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

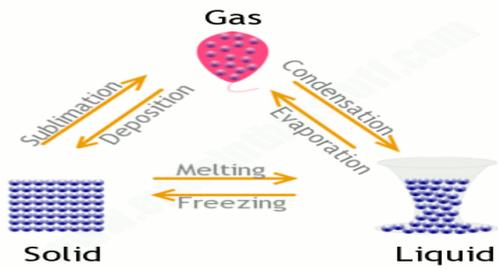
Specific Latent Heat	Energy needed to change 1kg of a substance's state
Specific Latent Heat of Fusion	Energy needed to change 1kg of solid into 1 kg of liquid at the same temperature
Specific Latent Heat of Vaporisation	Energy needed to change 1kg of liquid into 1 kg of gas at the same temperature

Internal energy	Energy stored inside a system by particles	Internal energy is the total kinetic and potential energy of all the particles (atoms and molecules) in a system.
	Heating changes the energy stored within a system	Heating causes a change in state. As particles separate, potential energy stored increases. Heating increases the temperature of a system. Particles move faster so kinetic energy of particles increases.

Energy needed = mass X specific latent heat.

$$\Delta E = m \times L$$

Year 9 Science: Particle Arrangement and Change of State



PHYSICS ONLY: when you do work the temperature increases e.g. pump air quickly into a ball, the air gets hot because as the piston in the pump moves the particles bounce off increasing kinetic energy, which causes a temperature rise.

PV = constant.
 $P_1V_1 = P_2V_2$

Pressure

Internal energy and energy transfers

Specific Heat Capacity	Energy needed to raise 1kg of substance by 1°C	Depends on:
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Change in thermal energy = mass X specific heat capacity X temperature change.

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

Specific Latent Heat	
Specific Latent Heat of Fusion	
Specific Latent Heat of Vaporisation	

Internal energy	Energy stored inside a system by particles	
	Heating changes the energy stored within a system	

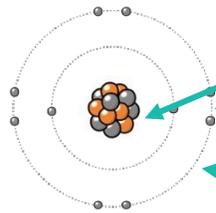
Energy needed =

$\Delta E = m \times L$

Year 9 Science: The Structure of Atoms and Groups

Atoms, elements and compounds

Atom	<i>The smallest part of an element that can exist</i>	Have a radius of around 0.1 nanometres and have no charge (0).
Element	<i>Contains only one type of atom</i>	Around 100 different elements each one is represented by a symbol e.g. O, Na, Br.
Compound	<i>Two or more elements chemically combined</i>	Compounds can only be separated into elements by chemical reactions.



Central nucleus	Contains protons and neutrons
Electron shells	Contains electrons

Name of Particle	Relative Charge	Relative Mass
Proton	+1	1
Neutron	0	1
Electron	-1	Very small

Electronic shell	Max number of electrons
1	2
2	8
3	8
4	8

Electronic structures

Relative electrical charges of subatomic particles



Mass number	The sum of the protons and neutrons in the nucleus	
Atomic number	The number of protons in the atom	Number of electrons = number of protons

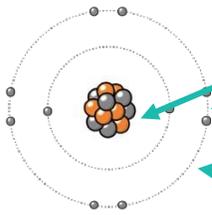
Mixtures	Two or more elements or compounds not chemically combined together	Can be separated by physical processes.
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Method	Description	Example
Filtration	Separating an insoluble solid from a liquid	To get sand from a mixture of sand, salt and water.
Crystallisation	To separate a solid from a solution	To obtain pure crystals of sodium chloride from salt water.
Simple distillation	To separate a solvent from a solution	To get pure water from salt water.
Fractional distillation	Separating a mixture of liquids each with different boiling points	To separate the different compounds in crude oil.
Chromatography	Separating substances that move by different amounts (due to solubility) through a medium	To separate out the dyes in food colouring.

Year 9 Science: The Structure of Atoms and Groups

Atoms, elements and compounds

Atom	<i>The smallest part of an element that can exist</i>	
Element	<i>Contains only one type of atom</i>	
Compound	<i>Two or more elements chemically combined</i>	



Central nucleus	
Electron shells	

Name of Particle	Relative Charge	Relative Mass
Proton		
Neutron		
Electron		

Electronic shell	Max number of electrons
1	
2	
3	
4	

Electronic structures

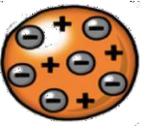
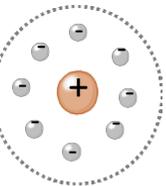
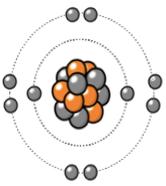
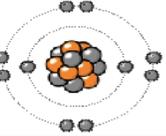
Relative electrical charges of subatomic particles

<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <p>7 Li 3</p> </div>	Mass number		
	Atomic number		

Mixtures	Two or more elements or compounds not chemically combined together	
----------	--	--

Method	Description	Example
Filtration		
Crystallisation		
Simple distillation		
Fractional distillation		
Chromatography		

Year 9 Science: The Structure of Atoms and Groups and Periods

(1803)		Suggested idea of atoms as small spheres that cannot be cut.
Thomson (1904)		Proposed 'plum pudding' model – atoms are a ball of positive charge with negative electrons embedded in it.
Geiger and Marsden (1909)	Diagram below	Directed beam of alpha particles (He^{2+}) at a thin sheet of gold foil. Found most travelled through, some were deflected, some bounced back.
(1911)		Used above evidence to suggest alpha particles deflected due to electrostatic interaction between the very small charged nucleus. Proposed mass and positive charge contained in nucleus while electrons found outside the nucleus which cancel the positive charge exactly.
Bohr (1913)		Suggested modern model of atom – electrons in circular orbits around nucleus, electrons can change orbits by emitting or absorbing electromagnetic radiation. His research led to the idea of some particles within the nucleus having positive charge; these were named protons.
Chadwick (1932)		Discovered neutrons in nucleus – enabling other scientists to account for mass of atom.

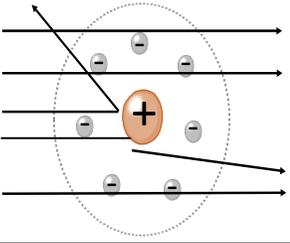
Relative atomic mass

Isotopes

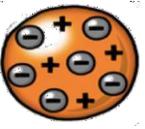
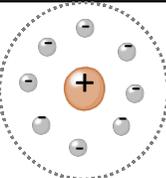
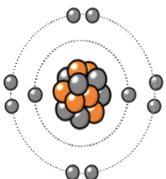
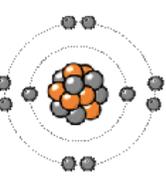
Atoms of the same element with the same number of protons and different numbers of neutrons

^{35}Cl (75%) and ^{37}Cl (25%)
 Relative abundance =
 $(\% \text{ isotope 1} \times \text{mass isotope 1}) + (\% \text{ isotope 2} \times \text{mass isotope 2}) \div 100$
 e.g. $(25 \times 37) + (75 \times 35) \div 100 = 35.5$

The development of the model of the atom

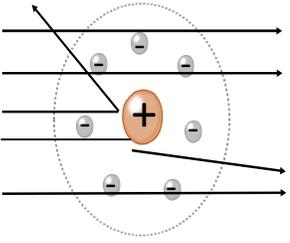
Rutherford's scattering experiment	<p>A beam of alpha particles are directed at a very thin gold foil</p> 	<p>Most of the alpha particles passed right through. A few (+) alpha particles were deflected by the positive nucleus. A tiny number of particles reflected back from the nucleus.</p>
	<p>Chemical equation</p> <p><i>Show chemical reactions - need reactant(s) and product(s)</i></p>	<p>Law of conservation of mass states the total mass of products = the total mass of reactants.</p>
Word equations	<p>Uses words to show reaction</p> <p>reactants \rightarrow products</p> <p>e.g. magnesium + oxygen \rightarrow magnesium oxide</p>	<p>Does not show what is happening to the atoms or the number of atoms.</p>
Symbol equations	<p>Uses symbols to show reaction</p> <p>reactants \rightarrow products</p> <p>e.g. $2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$</p>	<p>Shows the number of atoms and molecules in the reaction, these need to be balanced.</p>

Year 9 Science: The Structure of Atoms and Groups and Periods

(1803)		
Thomson (1904)		
Geiger and Marsden (1909)	Diagram below	
(1911)		
Bohr (1913)		
Chadwick (1932)		

Relative atomic mass	Isotopes	
		<p>^{35}Cl (75%) and ^{37}Cl (25%)</p> <p>Relative abundance = $(\% \text{ isotope 1} \times \text{mass isotope 1}) + (\% \text{ isotope 2} \times \text{mass isotope 2}) \div 100$ e.g. $(25 \times 37) + (75 \times 35) \div 100 = 35.5$</p>

The development of the model of the atom

Rutherford's scattering experiment	<p>A beam of alpha particles are directed at a very thin gold foil</p> 	
	Chemical equation	<p><i>Show chemical reactions - need reactant(s) and product(s)</i></p> <p>Law of conservation of mass states the total mass of products = the total mass of reactants.</p>
Word equations	<p>Uses words to show reaction reactants → products e.g. magnesium + oxygen → magnesium oxide</p>	
Symbol equations	<p>Uses symbols to show reaction reactants → products e.g. $2\text{Mg} + \text{O}_2 \rightarrow 2\text{MgO}$</p>	

Year 9 Science: The Structure of Atoms and Groups and Periods

Alkali metals: 1, 2
Transition metals
Halogens: 3, 4, 5, 6, 7
Noble gases: 0

H																				He
Li	Be											B	C	N	O	F				Ne
Na	Mg											Al	Si	P	S	Cl				Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br				Kr
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I				Xe
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At				Rn
Fr	Ra	Ac	Rf	Db	Sg	Bh	Hs	Mt	?	?	?									

The Periodic table

Development of the Periodic table

Elements arranged in order of atomic number

Elements with similar properties are in columns called groups

Elements in the same group have the same number of outer shell electrons and elements in the same period (row) have the same number of electron shells.

Before discovery of protons, neutrons and electrons

Elements arranged in order of atomic weight

Early periodic tables were incomplete, some elements were placed in inappropriate groups if the strict order atomic weights was followed.

Metals	To the left of the Periodic table	Form positive ions. Conductors, high melting and boiling points, ductile, malleable.
Non metals	To the right of the Periodic table	Form negative ions. Insulators, low melting and boiling points.

Mendeleev

Left gaps for elements that hadn't been discovered yet

Elements with properties predicted by Mendeleev were discovered and filled in the gaps. Knowledge of isotopes explained why order based on atomic weights was not always correct.

Halogens	Consist of molecules made of a pair of atoms	Have seven electrons in their outer shell. Form -1 ions.
	Melting and boiling points increase down the group (gas → liquid → solid)	Increasing atomic mass number.
	Reactivity decreases down the group	Increasing proton number means an electron is harder to gain.

Alkali metals

Very reactive with oxygen, water and chlorine

Only have one electron in their outer shell. Form +1 ions.

Reactivity increases down the group

Negative outer electron is further away from the positive nucleus so is more easily lost.

Year 9 Science: The Structure of Atoms and Groups and Periods

Alkali metals: 1, 2
Transition metals: 3-10
Halogens: 17, 18
Noble gases: 18

H																			He
Li	Be																		Ne
Na	Mg																		Ar
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr		
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe		
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn		
Fr	Ra	Ac	Rf	Db	Sg	Bh	Hs	Mt	?	?	?								

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Development of the Periodic table

The Periodic table

Elements arranged in order of atomic number

Elements with similar properties are in columns called groups

Before discovery of protons, neutrons and electrons

Elements arranged in order of atomic weight

Metals	To the left of the Periodic table	
Non metals	To the right of the Periodic table	

Mendeleev

Left gaps for elements that hadn't been discovered yet

Halogens	Consist of molecules made of a pair of atoms	
	Melting and boiling points increase down the group (gas → liquid → solid)	
	Reactivity decreases down the group	

Alkali metals

Very reactive with oxygen, water and chlorine

Reactivity increases down the group

Year 9 Science: The Structure of Atoms and Groups and Periods

Transition metals (Chemistry only)

Noble gases	Very unreactive, do not form molecules	This is due to having full outer shells of electrons.
	Boiling points increase down the group	Increasing atomic number.

Compared to group 1	<ul style="list-style-type: none"> • Less reactive • Harder • Denser • Higher melting points 	<ul style="list-style-type: none"> • Cu^{2+} is blue • Ni^{2+} is pale green, used in the manufacture of margarine • Fe^{2+} is green, used in the Haber process • Fe^{3+} is reddish-brown • Mn^{2+} is pale pink
Typical properties	<ul style="list-style-type: none"> • Many have different ion possibilities with different charges • Used as catalysts • Form coloured compounds 	

With oxygen	Forms a metal oxide	Metal + oxygen \rightarrow metal oxide	e.g. $4Na + O_2 \rightarrow 2Na_2O$
With water	Forms a metal hydroxide and hydrogen	Metal + water \rightarrow metal hydroxide + hydrogen	e.g. $2Na + 2H_2O \rightarrow 2NaOH + H_2$
With chlorine	Forms a metal chloride	Metal + chlorine \rightarrow metal chloride	e.g. $2Na + Cl_2 \rightarrow 2NaCl$

With metals	Forms a metal halide	Metal + halogen \rightarrow metal halide e.g. Sodium + chlorine \rightarrow sodium chloride	e.g. NaCl metal atom loses outer shell electrons and halogen gains an outer shell electron
With hydrogen	Forms a hydrogen halide	Hydrogen + halogen \rightarrow hydrogen halide e.g. Hydrogen + bromine \rightarrow hydrogen bromide	e.g. $Cl_2 + H_2 \rightarrow 2HCl$
With aqueous solution of a halide salt	A more reactive halogen will displace the less reactive halogen from the salt	Chlorine + potassium bromide \rightarrow potassium chloride + bromine	e.g. $Cl_2 + 2KBr \rightarrow 2KCl + Br_2$

Year 9 Science: The Structure of Atoms and Groups and Periods

Transition metals (Chemistry only)

Noble gases	Very unreactive, do not form molecules	
	Boiling points increase down the group	

With oxygen	Forms a metal oxide		e.g. $4\text{Na} + \text{O}_2 \rightarrow 2\text{Na}_2\text{O}$
With water	Forms a metal hydroxide and hydrogen		e.g. $2\text{Na} + 2\text{H}_2\text{O} \rightarrow 2\text{NaOH} + \text{H}_2$
With chlorine	Forms a metal chloride		e.g. $2\text{Na} + \text{Cl}_2 \rightarrow 2\text{NaCl}$

Compared to group 1		<ul style="list-style-type: none"> • Cu^{2+} is blue • Ni^{2+} is pale green, used in the manufacture of margarine • Fe^{2+} is green, used in the Haber process • Fe^{3+} is reddish-brown • Mn^{2+} is pale pink
Typical properties		

With metals			e.g. NaCl metal atom loses outer shell electrons and halogen gains an outer shell electron
With hydrogen			e.g. $\text{Cl}_2 + \text{H}_2 \rightarrow 2\text{HCl}$
With aqueous solution of a halide salt			e.g. $\text{Cl}_2 + 2\text{KBr} \rightarrow 2\text{KCl} + \text{Br}_2$

Year 9 science: Energy

Kinetic energy	Energy stored by a moving object	$\frac{1}{2} \times \text{mass} \times (\text{speed})^2$ $\frac{1}{2} mv^2$
Elastic Potential energy	Energy stored in a stretched spring, elastic band	$\frac{1}{2} \times \text{spring constant} \times (\text{extension})^2$ $\frac{1}{2} ke^2$ (Assuming the limit of proportionality has not been exceeded)
Gravitational Potential energy	Energy gained by an object raised above the ground	Mass X gravitational field strength X height mgh

System	An object or group of objects that interact together	EG: Kettle boiling water.
Energy stores	Kinetic, chemical, internal (thermal), gravitational potential, elastic potential, magnetic, electrostatic, nuclear	Energy is gained or lost from the object or device.
Ways to transfer energy	Light, sound, electricity, thermal, kinetic are ways to transfer from one store to another store of energy.	EG: electrical energy transfers chemical energy into thermal energy to heat water up.
Unit	Joules (J)	

Work	Doing work transfers energy from one store to another	By applying a force to move an object the energy store is changed.	Work done = Force X distance moved $W = Fs$
Power	The rate of energy transfer	1 Joule of energy per second = 1 watt of power	Power = energy transfer ÷ time $P = E \div t$ Power = work done ÷ time, $P = W \div t$

	Units
Specific Heat Capacity	Joules per Kilogram degree Celsius (J/Kg°C)
Temperature change	Degrees Celsius (°C)
Work done	Joules (J)
Force	Newton (N)
Distance moved	Metre (m)
Power	Watts (W)
Time	Seconds (s)

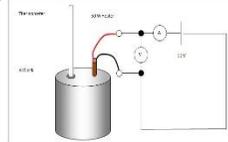
Useful energy	Energy transferred and used	
Wasted energy	Dissipated energy, stored less usefully	

Prefix	Multiple	Standard form
Kilo	1000	10^3
Mega	1000 000	10^6
Giga	100 000 000	10^9

Change in thermal energy = mass X specific heat capacity X temperature change

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

Specific Heat Capacity	Energy needed to raise 1kg of substance by 1°C	Depends on: mass of substance, what the substance is and energy put into the system.
------------------------	---	--



Mechanical	Force acts upon an object
Electrical	Electric current flow
Heat	Temperature difference between objects
Radiation	Electromagnetic waves or sound

Closed system	No change in total energy in system
Open system	Energy can dissipate

HIGHER: efficiency can be increased using machines.

$$\text{Efficiency} = \frac{\text{Useful power output}}{\text{Total power input}}$$

$$\text{Efficiency} = \frac{\text{Useful output energy transfer}}{\text{Total input energy transfer}}$$

Energy Conservation and Dissipation

Energy pathways	Efficiency	How much energy is usefully transferred
------------------------	------------	--

Dissipate	To scatter in all directions or to use wastefully	When energy is 'wasted', it dissipates into the surroundings as internal (thermal) energy.
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Ways to reduce 'wasted' energy	Energy transferred usefully	Insulation, streamline design, lubrication of moving parts.
--------------------------------	------------------------------------	---

Principle of conservation of energy	The amount of energy always stays the same.	Energy cannot be created or destroyed, only changed from one store to another.
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HIGHER: When an object is moved, energy is transferred by doing work.

Work done = Force X distance moved

Frictional forces cause energy to be transferred as thermal energy. This is wasted.

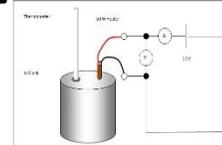
Reducing friction - using wheels, applying lubrication.
Reducing air resistance - travelling slowly, streamlining.

	Units
Energy (KE, EPE, GPE, thermal)	Joules (J)
Velocity	Metres per second (m/s)
Spring constant	Newton per metre (N/m)
Extension	Metres (m)
Mass	Kilogram (Kg)
Gravitational field strength	Newton per kilogram (N/Kg)
Height	Metres (m)

Year 9 science: Energy

Change in thermal energy = mass X specific heat capacity X temperature change

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



Kinetic energy		
Elastic Potential energy		
Gravitational Potential energy		

Specific Heat Capacity		
------------------------	--	--

Energy Conservation and Dissipation

Mechanical	
Electrical	
Heat	
Radiation	

Energy pathways

Efficiency	
------------	--

System		
Energy stores		
Ways to transfer energy		
Unit		

Closed system	
Open system	

HIGHER:

Dissipate		
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Ways to reduce 'wasted' energy		
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Work			
Power			

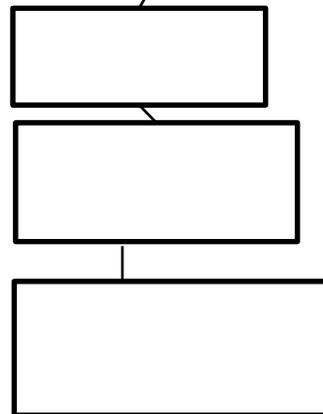
HIGHER:

Principle of conservation of energy		
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	Units
Specific Heat Capacity	
Temperature change	
Work done	
Force	
Distance moved	
Power	
Time	

Useful energy	
Wasted energy	

Prefix	Multiple	Standard form
Kilo		
Mega		
Giga		



	Units
Energy (KE, EPE, GPE, thermal)	
Velocity	
Spring constant	
Extension	
Mass	
Gravitational field strength	
Height	

Year 9 science: Energy

Using renewable energy will need to increase to meet demand.

Energy demand is increasing as population increases.

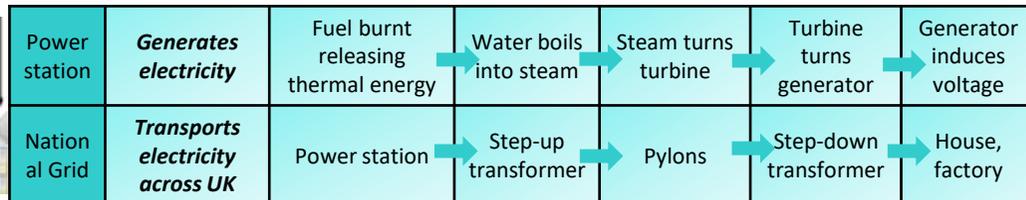
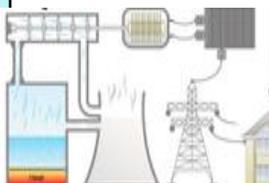
Power station – NB: You need to understand the principle behind generating electricity. An energy resource is burnt to make steam to drive a turbine which drives the generator.

Renewable energy makes up about 20% of energy consumption.

Fossil fuel reserves are running out.

Transport	Petrol, diesel, kerosene produced from oil	Used in cars, trains and planes.
Heating	Gas and electricity	Used in buildings.
Electricity	Most generated by fossil fuels	Used to power most devices.

Non-renewable energy resource	These will run out. It is a finite reserve. It cannot be replenished.	e.g. Fossil fuels (coal, oil and gas) and nuclear fuels.
Renewable energy resource	These will never run out. It is an infinite reserve. It can be replenished.	e.g. Solar, Tides, Waves, Wind, Geothermal, Biomass, Hydroelectric



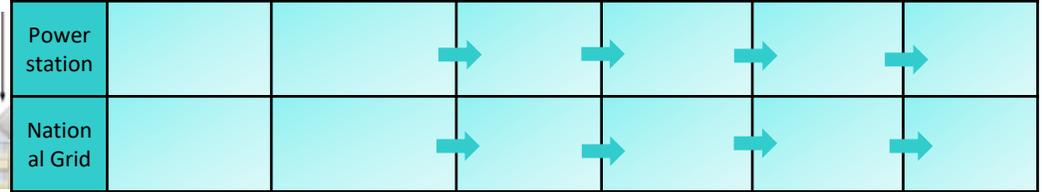
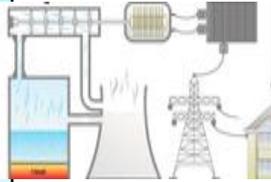
Energy resource	How it works	Uses	Positive	Negative
Fossil Fuels (coal, oil and gas)	Burnt to release thermal energy used to turn water into steam to turn turbines	Generating electricity, heating and transport	Provides most of the UK energy. Large reserves. Cheap to extract. Used in transport, heating and making electricity. Easy to transport.	Non-renewable. Burning coal and oil releases sulfur dioxide. When mixed with rain makes acid rain. Acid rain damages building and kills plants. Burning fossil fuels releases carbon dioxide which contributes to global warming. Serious environmental damage if oil spilt.
Nuclear	Nuclear fission process	Generating electricity	No greenhouse gases produced. Lots of energy produced from small amounts of fuel.	Non-renewable. Dangers of radioactive materials being released into air or water. Nuclear sites need high levels of security. Start up costs and decommission costs very expensive. Toxic waste needs careful storing.
Biofuel	Plant matter burnt to release thermal energy	Transport and generating electricity	Renewable. As plants grow, they remove carbon dioxide. They are 'carbon neutral'.	Large areas of land needed to grow fuel crops. Habitats destroyed and food not grown. Emits carbon dioxide when burnt thus adding to greenhouse gases and global warming.
Tides	Every day tides rise and fall, so generation of electricity can be predicted	Generating electricity	Renewable. Predictable due to consistency of tides. No greenhouse gases produced.	Expensive to set up. A dam like structure is built across an estuary, altering habitats and causing problems for ships and boats.
Waves	Up and down motion turns turbines	Generating electricity	Renewable. No waste products.	Can be unreliable depends on wave output as large waves can stop the pistons working.
Hydroelectric	Falling water spins a turbine	Generating electricity	Renewable. No waste products.	Habitats destroyed when dam is built.
Wind	Movement causes turbine to spin which turns a generator	Generating electricity	Renewable. No waste products.	Unreliable – wind varies. Visual and noise pollution. Dangerous to migrating birds.
Solar	Directly heats objects in solar panels or sunlight captured in photovoltaic cells	Generating electricity and some heating	Renewable. No waste products.	Making and installing solar panels expensive. Unreliable due to light intensity.
Geothermal	Hot rocks under the ground heats water to produce steam to turn turbine	Generating electricity and heating	Renewable. Clean. No greenhouse gases produced.	Limited to a small number of countries. Geothermal power stations can cause earthquake tremors.

Year 9 science: Energy

Power station –

Transport		
Heating		
Electricity		

Non-renewable energy resource		
Renewable energy resource		

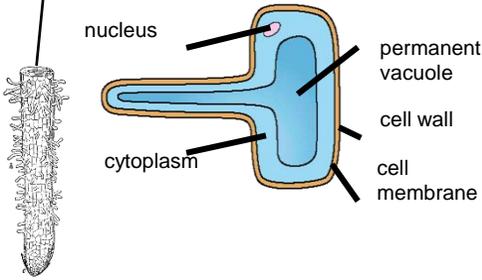
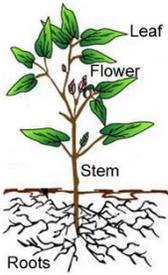


Energy resource	How it works	Uses	Positive	Negative
Fossil Fuels (coal, oil and gas)				
Nuclear				
Biofuel				
Tides				
Waves				
Hydroelectric				
Wind				
Solar				
Geothermal				

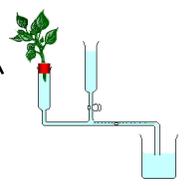
Year 9 science: Reactions in cells

Plant organ systems

The roots, stem and leaves form a plant organ system for transport of substances around the plant

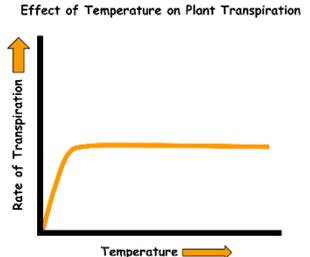


A potometer is used to measure the amount of water lost over time (rate of transpiration)

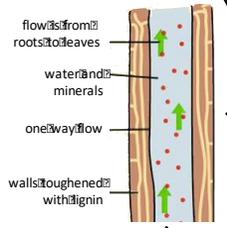
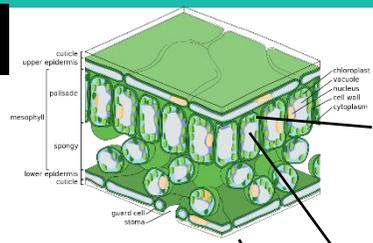
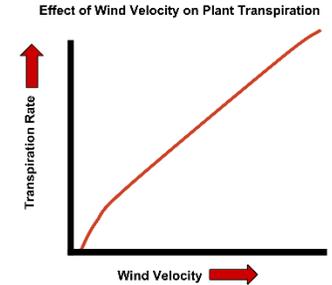
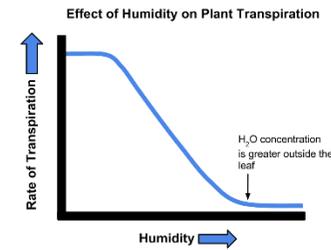


Transpiration

Transpiration	The rate at which water is lost from the leaves of a plant. The transpiration stream is the column of water moving through the roots, stem and leaves	<p>Temperature, humidity, air movement and light intensity affect the rate of transpiration.</p>
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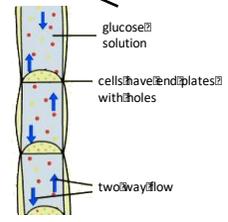
The shape of the graph for light intensity is the same for temperature (energy)



xylem



phloem

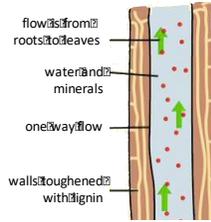
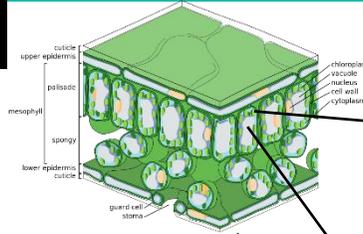
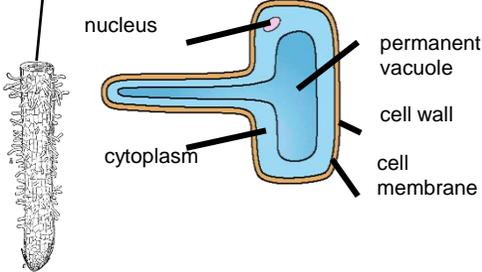
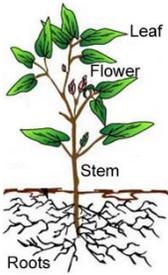


Plant tissues

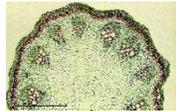
Epidermal tissues	<i>Waxy cuticle (top layer of the leaf)</i>	Reduces water loss from the leaf
	<i>Guard cells and stomata</i>	Guard cells open and close the stomata to control water loss and allow for gas exchange (oxygen and carbon dioxide).
Palisade mesophyll	<i>Palisade cells</i>	Cells near the top surface of the leaf that are packed with chloroplasts that contain chlorophyll. Both adaptations maximize photosynthesis.
Spongy mesophyll	<i>Air spaces in the leaf between cells</i>	Increased surface area for gas exchange so that carbon dioxide can diffuse into photosynthesising cells.
xylem	<i>Hollow tubes strengthened by lignin adapted for the transportation of water in the transpiration stream</i>	Allows transport of water and mineral ions from the roots to the stem and the leaves.
phloem	<i>Cell sap moves from one phloem cell to the next through pores in the end walls</i>	Transports dissolved sugars from the leaves to the rest of the plant for immediate use or storage (translocation).
Meristem tissue	<i>New cells (roots and shoot tips) are made here including root hair cells</i>	Root hair cells have an increased surface area for the uptake of water by osmosis, and mineral ions by active transport.

Year 9 science: Reactions in cells

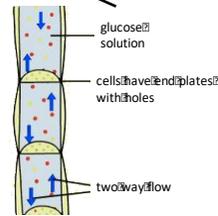
Plant organ systems



xylem

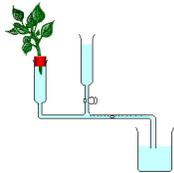


phloem

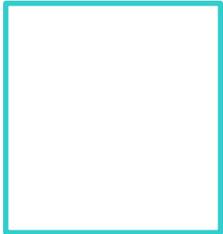
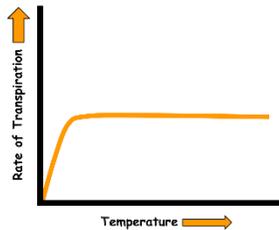


Plant tissues

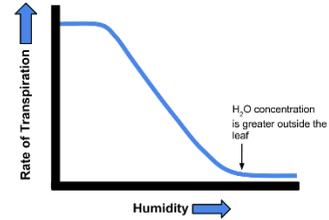
Transpiration



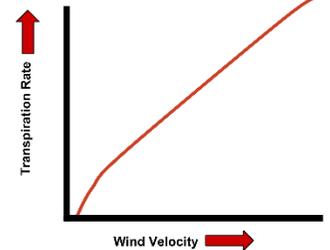
Effect of Temperature on Plant Transpiration



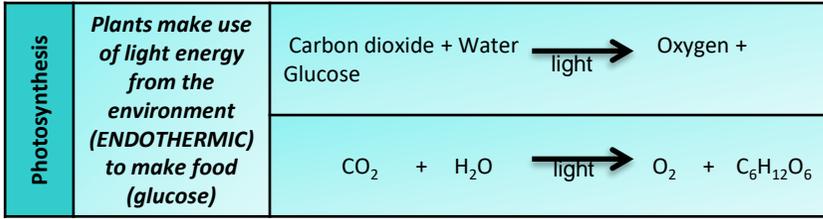
Effect of Humidity on Plant Transpiration



Effect of Wind Velocity on Plant Transpiration



Year 9 science: Reactions in cells



Respiration, stored as insoluble starch, fats or oils for storage, cellulose for cell walls, combine with nitrates from the soil to form amino acids for protein synthesis

Plants use the glucose produced in photosynthesis in a variety of ways

The plant manufactures glucose from carbon dioxide and water using energy transferred from the environment to the chloroplasts by light

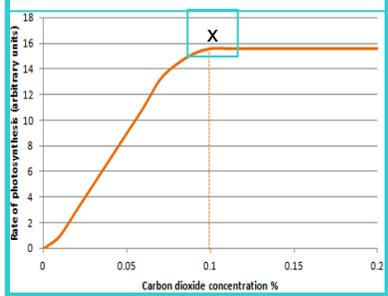
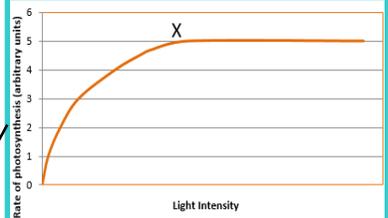
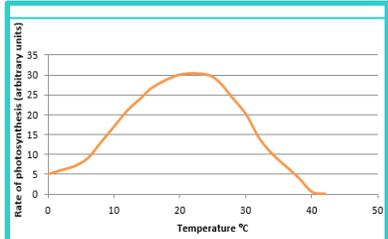
Factor	How the rate is affected	Limiting factors (why the rate stops going up)
Temperature	As the temperature of the environment the plant is in increases rate of photosynthesis increases (up to a point) as there is more energy for the chemical reaction.	Photosynthesis is an enzyme controlled reaction. If the temperature increases too much, then the enzymes become denatured and the rate of reaction will decrease and stop
Light intensity	Light intensity increases as the distance between the plant and the light sources increases. As light intensity increases so does the rate of photosynthesis (up to a point) as more energy is available for the chemical reaction.	At point X another factor is limiting the rate of photosynthesis. This could be carbon dioxide concentration, temperature or the amount of chlorophyll
Carbon dioxide concentration	Carbon dioxide is needed for plants to make glucose. The rate of photosynthesis will increase when a plant is given higher concentrations of carbon dioxide (up to a point).	At point X another factor is limiting the rate of photosynthesis. This could be light intensity, temperature or the amount of chlorophyll
Amount of chlorophyll	Chlorophyll is a photosynthetic pigment that absorbs light and allows the reaction between water and carbon dioxide to occur (photosynthesis)	Another factor could limit the rate of photosynthesis. This could be light intensity, temperature or the carbon dioxide concentration

Control conditions in greenhouses to reduce limiting factors can improve crop yields	Heating	Used to provide optimum temperatures for maximum plant growth.
	Artificial lighting	Enhances the natural sunlight especially overnight and on cloudy days.
	Extra carbon dioxide	Gas can be pumped into the air inside the greenhouse.

Growers must balance the economics of additional costs of controlling the conditions to maximise photosynthesis with making a profit.



Rate of photosynthesis HT Only



Light intensity obeys the inverse square law. This means that if you double the distance between the plant and the light source you quarter the light intensity

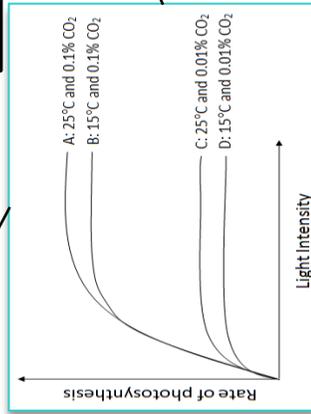
Graph lines C and D: If temperature is increased by 10°C then a slight increase in rate of photosynthesis occurs.

Explain graphs of two or three factors and decide which is the limiting factor

Graph lines A and D: If carbon dioxide concentration and temperature are increased the rate of photosynthesis increases significantly up to a point.

Graph Lines A and B: If carbon dioxide concentration is increased from 0.01% to 0.1% then a large increase in rate occurs up to a point.

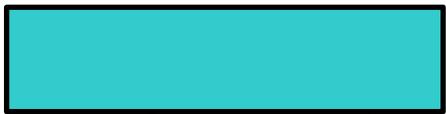
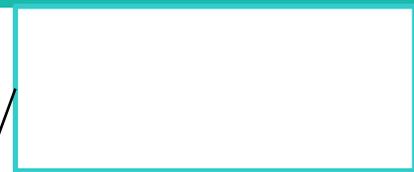
Graph line A: Rate could be limited by temperature and/or amount of chlorophyll. Plant tissue can be damaged when carbon dioxide concentrations exceed 0.1%



Year 9 science: Reactions in cells

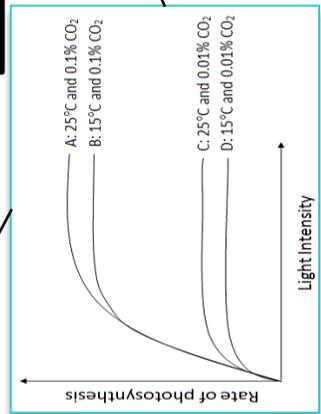
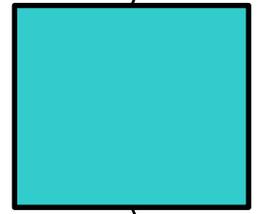
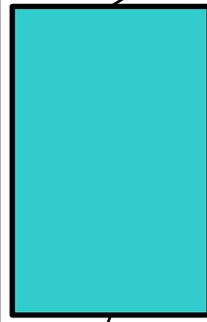
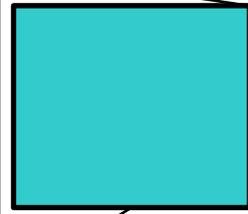
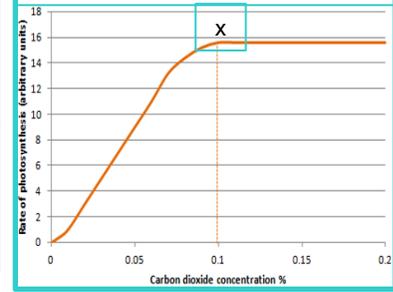
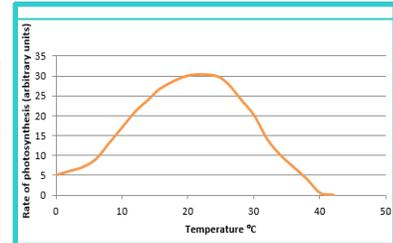


Control conditions in greenhouses to reduce limiting factors can improve crop yields



Rate of photosynthesis HT Only

Factor	How the rate is affected	Limiting factors (why the rate stops going up)
Temperature		
Light intensity		
Carbon dioxide concentration		
Amount of chlorophyll		

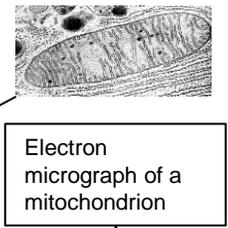


Year 9 science: Reactions in cells

An organism will receive all the energy it needs for living processes as a result of the energy transferred from respiration	For movement	To enable muscles to contract in animals.
	For keeping warm	To keep a steady body temperature in a cold environment.
	For chemical reactions	To build larger molecules from smaller one.

Respiration

Cellular respiration is an exothermic reaction which is continuously occurring in all living cells



Response to exercise

During exercise the human body reacts to increased demand for energy	Heart rate increases	Top pump oxygenated blood faster to the muscle tissues and cells.
	Breathing rate and breath volume increase	This increases the amount of oxygen entering the blood stream.

During long periods of vigorous activity muscles become fatigued and stop contracting efficiently

Metabolism

Metabolism is the sum of all the reactions in a cell or the body

Metabolism	The energy transferred by respiration in cells is used by the organism for the continual enzyme controlled processes of metabolism.	Conversion of glucose to starch, glycogen and cellulose.
		The formation of lipid molecules from a molecule of glycerol and three molecules of fatty acid.
		The use of glucose and nitrate ions to form amino acids which in turn are used to synthesise proteins.
		Respiration
		Breakdown of excess proteins to form urea for excretion.

Anaerobic respiration in plant and yeast cells
 The end products are ethanol and carbon dioxide. Anaerobic respiration in yeast cells is called fermentation
 glucose → ethanol + carbon dioxide

This process is economically important in the manufacture of alcoholic drinks and bread.



Anaerobic respiration
 Respiration when oxygen is in short supply. Occurs during intensive exercise
 During hard exercise, muscle cells are respiring so fast that blood cannot transport enough oxygen to meet their needs.
 Glucose is partially oxidised to produce lactic acid which builds up in muscle tissue causing them to become painful and fatigued.
 glucose → lactic acid

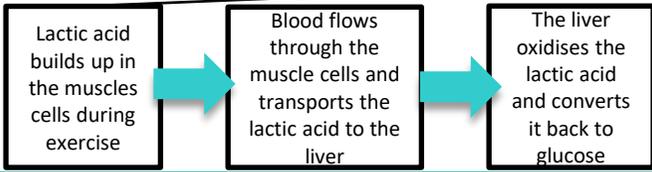
Anaerobic respiration releases a much smaller amount of energy than aerobic respiration.

The incomplete oxidation of glucose causes a build up of lactic acid and creates an oxygen debt

Aerobic respiration
 Respiration with oxygen. Occurs inside the mitochondria continuously
 Glucose is oxidised by oxygen to transfer the energy the organism needs to perform it's functions.
 $C_6H_{12}O_6 + O_2 \rightarrow CO_2 + H_2O$
 carbon dioxide + water
 glucose + oxygen

Aerobic respiration releases a large amount of energy from each glucose molecule

The extra amount of oxygen required to remove all lactic acids from cells is called the oxygen debt

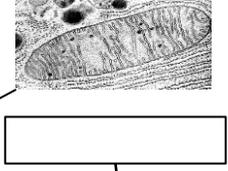


Response to exercise HT only

Year 9 science: Reactions in cells

Respiration

Response to exercise





Metabolism



Metabolism		

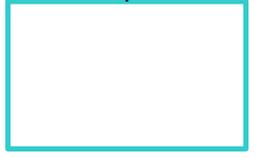
Anaerobic respiration in plant and yeast cells



Anaerobic respiration



Aerobic respiration



Response to exercise HT only



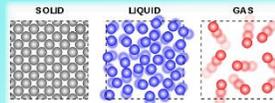
Year 9 science: How elements make compounds

Ionic	Particles are oppositely charged ions	Occurs in compounds formed from metals combined with non metals.
Covalent	Particles are atoms that share pairs of electrons	Occurs in most non metallic elements and in compounds of non metals.
Metallic	Particles are atoms which share delocalised electrons	Occurs in metallic elements and alloys.

Chemical bonds

Solid, liquid, gas

Melting and freezing happen at melting point, boiling and condensing happen at boiling point.



The amount of energy needed for a state change depends on the strength of forces between particles in the substance.

(HT only)
Limitations of simple model:

- There are no forces in the model
- All particles are shown as spheres
- Spheres are solid

s	solid
l	liquid
g	gas

The three states of matter

Metals as conductors

High melting and boiling points

This is due to the strong metallic bonds.

Pure metals can be bent and shaped

Atoms are arranged in layers that can slide over each other.

Good conductors of electricity

Delocalised electrons carry electrical charge through the metal.

Good conductors of thermal energy

Energy is transferred by the delocalised electrons.

Properties of metals and alloys

High melting and boiling points

Large amounts of energy needed to break the bonds.

Do not conduct electricity when solid

Ions are held in a fixed position in the lattice and cannot move.

Do conduct electricity when molten or dissolved

Lattice breaks apart and the ions are free to move.

Properties of ionic compounds

Ionic bonding

Alloys

Mixture of two or more elements at least one of which is a metal

Harder than pure metals because atoms of different sizes disrupt the layers so they cannot slide over each other.

Electrons are transferred so that all atoms have a noble gas configuration (full outer shells).

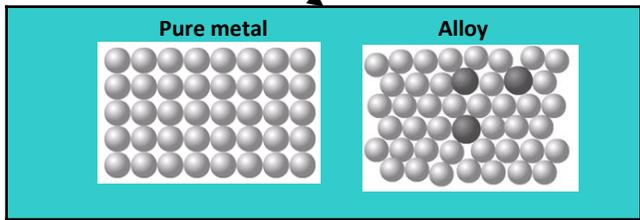
Metal atoms lose electrons and become positively charged ions

Group 1 metals form +1 ions
Group 2 metals form +2 ions

Non metals atoms gain electrons to become negatively charged ions

Group 6 non metals form -2 ions
Group 7 non metals form -1 ions

Metallic bonding



Dot and cross diagram

(2, 8, 1) (2, 8, 7) (2, 8) (2, 8, 8)

Giant structure

● Na+ ● Cl-

Ionic compounds

Structure

- Held together by strong electrostatic forces of attraction between oppositely charged ions
- Forces act in all directions in the lattice

Giant structure of atoms arranged in a regular pattern

Delocalised electrons Metal ions

Electrons in the outer shell of metal atoms are delocalised and free to move through the whole structure. This sharing of electrons leads to strong metallic bonds.

Year 9 science: How elements make compounds

Ionic		
Covalent		
Metallic		

Chemical bonds

Solid, liquid, gas

The three states of matter

s	
l	
g	

Properties of ionic compounds

Ionic bonding

Metals as conductors

Properties of metals and alloys

Alloys	
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Metallic bonding

Pure metal Alloy

Dot and cross diagram

(2, 8, 1) (2, 8, 7)

Giant structure

Na⁺ Cl⁻

Ionic compounds

Structure

--	--

Giant structure of atoms arranged in a regular pattern

Delocalised electrons Metal ions

Year 9 science: How elements make compounds

Very large molecules	<i>Solids at room temperature</i>	Atoms are linked by strong covalent bonds.	
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Polymers

<p><i>Each carbon atom is bonded to four others</i></p>	Very hard.	Rigid structure.
	Very high melting point.	Strong covalent bonds.
	Does not conduct electricity.	No delocalised electrons.

Usually gases or liquids	<p><i>Covalent bonds in the molecule are strong but forces between molecules (intermolecular) are weak</i></p>	Low melting and boiling points.	Due to having weak intermolecular forces that easily broken.
		Do not conduct electricity.	Due to them molecules not having an overall electrical charge.
		Larger molecules have higher melting and boiling points.	Intermolecular forces increase with the size of the molecules.

Properties of small molecules

Giant covalent structures- Diamond

Diamond, graphite, silicon dioxide	Very high melting points	Lots of energy needed to break strong, covalent bonds.
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Covalent bonding

Atoms share pairs of electrons

Can be small molecules e.g. ammonia

Dot and cross :
 + Show which atom the electrons in the bonds come from
 - All electrons are identical

2D with bonds:
 + Show which atoms are bonded together
 - It shows the H-C-H bond incorrectly at 90°

3D ball and stick model:
 + Attempts to show the H-C-H bond angle is 109.5°

Can be giant covalent structures e.g. polymers

Graphene	<p>Single layer of graphite one atom thick</p>	Excellent conductor.	Contains delocalised electrons.
		Very strong.	Contains strong covalent bonds.

Graphene and fullerenes

Nanoparticles	Between 1 and 100 nanometres (nm) in size	1 nanometre (1 nm) = 1×10^{-9} metres (0.000 000 001m or a billionth of a metre).
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Use of nanoparticles

Healthcare, cosmetics, sun cream, catalysts, deodorants, electronics.	Nanoparticles may be toxic to people. They may be able to enter the brain from the bloodstream and cause harm.
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Fullerenes		Buckminsterfullerene, C ₆₀ First fullerene to be discovered.	Hexagonal rings of carbon atoms with hollow shapes. Can also have rings of five (pentagonal) or seven (heptagonal) carbon atoms.
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Giant covalent structures- Graphite

Carbon nanotubes		<p><i>Very thin and long cylindrical fullerenes</i></p>	Very conductive.	Used in electronics industry.
			High tensile strength.	Reinforcing composite materials.
			Large surface area to volume ratio.	Catalysts and lubricants.

Each carbon atom is bonded to three others forming layers of hexagonal rings with no covalent bonds between the layers

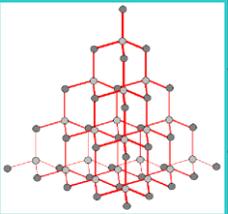
	Slippery.	Layers can slide over each other.
	Very high melting point.	Strong covalent bonds.
	Does conduct electricity.	Delocalised electrons between layers.

Year 9 science: How elements make compounds

Very large molecules

Polymers

Giant covalent structures-
Diamond



Diamond, graphite, silicon dioxide

Usually gases or liquids

Properties of small molecules

Covalent bonding

Size of particles and their properties (Chemistry only)

Atoms share pairs of electrons

Giant covalent structures-
Graphite

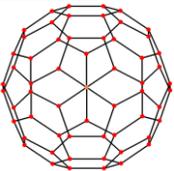
Graphene

Graphene and fullerenes

Nanoparticles

Use of nanoparticles

Fullerenes



Use of nanoparticles

Carbon nanotubes

